

Guidelines to **Ensure your Animals are Healthy**



Produced by KZN DAEARD and MRDT 2011



**agriculture, environmental affairs
& rural development**

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July 2007 (Revised 2011)

Produced by KwaZulu-Natal Department of Agriculture, Environmental Affairs and Rural Development (DAEARD) and Mdukutshani Rural Development Trust (MRDT)

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Introduction

What is this manual about?

This manual gives livestock owners and people who help them information about how to keep animals healthy and how to deal with animals that are sick.

Content of the manual

- Animal health
- Sickesses/diseases
- Treatment and prevention of sicknesses/diseases
- Information about specific sicknesses/diseases
- Vaccination programmes for livestock
- Dosage guidelines.

The section on **animal health** deals with improving the animal's natural capacity to fight disease. It asks what is a healthy animal and how does one keep an animal healthy? It looks at how we need to feed animals properly so that they stay healthy as well as why good hygiene practices are important to prevent the spread of disease and parasites.

The section on **sicknesses/diseases** deals with different causes of sickness. It gives information about different parasites and how to control them. It also looks at symptoms and factors that help the farmer to identify the diseases affecting livestock – including how to take an animal's temperature or check for signs of anaemia.

The section on **treatment** deals with things to consider when a farmer wants to treat livestock. This includes the kinds of treatments that are available, deciding which treatments to use, how much to use and how to give it as well as how to store medicines. This section also describes what it is useful to keep in a medical kit so that the farmer is always ready to treat his or her animals. It also provides information about handling and using vaccines correctly.

The section on **specific sicknesses/diseases** deals with a range of diseases and sicknesses that animals can suffer from. The symptoms of each disease as well as methods of prevention and treatment are described.

How to use the manual

Start by reading the first part of the manual, which tells you why it's important to keep your animals healthy and gives you basic information about how to do this. The next sections will help you to understand what causes your animals to get sick as well as providing you with general information about treating sick animals.

The next section of the manual gives more detailed information about how to recognise and treat diseases/sicknesses that your animals may be suffering from.

For each disease/sickness there is a picture that shows what types of animals are affected as well as a picture to help you recognise the disease.

1 Animal Health

This section deals with the health of individual animals as well as the health of the herd.

Why keep animals healthy?

A healthy animal is more able to resist diseases and can recover more easily when it does get sick. A sick animal costs a farmer money and time. A farmer with a sick animal has to buy medicines, syringes and needles. It is therefore better for a farmer if animals stay healthy and do not get sick.

Treatment is also more successful if it is given early, before the animal is so sick that the medicine can't help it. This means that a farmer must be able to tell very quickly if he or she has a sick animal, what sickness it has and what he or she can do about it.

Why is herd health important?

One sick animal can sometimes contaminate other healthy animals and cause them to get sick too. This can also result in the sick animal getting re-infected after it has recovered.

Sometimes when a farmer has many sick animals, or a neighbour has sick animals, it means that the amount of disease in the area is very high. It is very difficult to keep individual animals healthy when there is a lot of disease around.

This is also true of parasites that cause diseases, like ticks and worms. If some animals have a lot of ticks or worms, then it is difficult to stop the ticks and worms spreading to all the animals in a herd.

So before we consider how to treat diseases, it is best to think about how to recognise healthy animals and how to keep them healthy.

How can you tell if an animal is healthy?

Being able to tell if your animal is healthy will help you monitor your animals and therefore to keep them well.

Most experienced farmers can tell very quickly if their animals are not well. It's important to describe what a healthy animal looks like so that you can describe what the animal looks like when it is not well. This helps to identify what is wrong with the animal because different types of diseases have different symptoms.

A healthy animal is one that:

- ✓ Eats its food in the normal quantities that it usually eats.
- ✓ Moves around during the day in order to find food, water and shelter.
- ✓ Moves with the other animals if it is a flock or herd animal and does not stand or lie alone in a corner.
- ✓ Is chewing its cud (ruminating)
- ✓ Is breathing easily and not panting or struggling to breathe.
- ✓ Does not limp or hunch its back while it's walking and standing.
- ✓ Has no patch of missing feathers or fur.
- ✓ Has feathers or fur that are not lumpy, greasy or unpleasant to touch and smell.
- ✓ Has eyes that are shiny and clear.
- ✓ Has mucous membranes that are pinkish and not white
- ✓ Has a nose that is slightly damp for cattle and dry for goats.
- ✓ Has nostrils and/or eyes that are not runny with mucus.
- ✓ Has faeces and urine that are a normal colour and texture and the animal is defaecating/urinating normally.

This list could be added to depending on the animals you keep. For example, if you have pigs, you will be able to recognise that they are healthy if they are lively and inquisitive. You will know that they are not healthy if they have a thick, rough and dull coat. Take notice of how your animals look when they are healthy so that you can easily describe what is wrong with one when it gets sick. This will help you to know what is causing it to get sick.

What keeps animals healthy?

The immune system keeps the animal healthy. All animals and people have immune systems.

The job of the immune system is to fight germs that invade the animal and could cause it to get sick. The immune system is like the animal's own army, ready at all times to fight invaders that put the animal's life at risk.

The immune system is found everywhere in the animal's body. It is made up of millions of little cells that are too small for people to see with their eyes. When germs enter the animal's body, these immune cells come from all over to attack the germs. If the cells win the battle, the animal stays healthy. If they lose the battle, the animal may get sick and need treatment. The cells reproduce in bone marrow and spread around the body in the blood.

The immune system can recognise diseases if it has fought these diseases before. With some diseases, like contagious abortion (CA), this recognition lasts the animal's whole life. With other diseases, however, the immune system can recognise the disease when it is present often but stops being able to recognise it when the animal hasn't had it for a long time. Common diseases of this kind are those that ticks cause. This is one reason why animals often get sick in early summer when there are a lot of ticks after there have been so few in winter. Once the animal's immune system is used to the ticks again, then the animal can often fight the tick diseases.

Livestock owners who come from areas where the disease Heartwater occurs must be very careful about buying animals from other places, because if they come from areas that do not have Heartwater, the animals' immune systems will not recognise the disease and cannot protect them and they will get sick and may even die.

It is also important to know that, like an army, the immune system is divided into different sections, each one of which has its own germs to fight. For example, one section fights Redwater but it cannot fight Heartwater. Only the Heartwater section of the immune system can fight Heartwater. This means that just because the immune system can recognise one disease does not mean it can recognise all diseases.

One way of getting an animal to have contact with a weakened form of the disease without killing the animal is vaccination. Some vaccinations must be given every year while others need only be given once in an animal's life. Another way for the animal to develop its immune system is through the infant animal being born with some of its mother's immune cells. Infant livestock also develop stronger immune systems if they suckle their mothers very soon after birth to drink the first milk called colostrum, which is filled with the mother's immune cells (antibodies).

Animals that do not spend too much of their energy on getting warm or staying cool are more able to recover from disease. It is therefore wise to provide sick animals with shade and shelter from wind and rain to keep the animal warm and comfortable. Chickens especially need to keep warm because they have a high normal body temperature.

Why is food important?

No matter how good your animal's immune system, if it is constantly hungry and very thin, it will eventually become sick. This is because a thin animal's immune system cannot successfully fight all the different diseases trying to attack it. One or more of these diseases will eventually defeat the immune system of the hungry

animal, making it weaker and more susceptible to all the other diseases waiting to attack.

It is better to try to feed an animal properly so that it is generally in good condition. If it gets sick, such an animal is more likely to recover from illness than a hungry, thin one. A well-fed animal that gets sick can sometimes recover by itself without treatment.

It is therefore important that animals have enough food so that they are able to maintain their immune system and to fight disease. A well-fed animal is usually a healthy animal with a strong immune system. In winter when there is not enough good quality food, animals can get sick very easily.

Animals that are fed properly are also generally more productive, producing more milk, growing faster and getting back in calf quicker after calving.

Vitamin and mineral deficiencies in the diet (e.g. calcium and phosphorus) limit animal performance (For example, they might not conceive or they might grow slower or produce less milk). Some deficiencies actually cause health problems and diseases (for example abortions). Sometimes animals chew bones or eat soil or plastics to try to find the mineral they are missing.

Farmers need to make sure that their animals are not suffering from such deficiencies and provide supplements, especially in winter. Supplementation is the practice of supplying those nutrients, minerals and vitamins that are missing in the animal's diet. Different types of licks should be provided at different times of year to address the deficiencies that exist at that time. Generally, supplementation requires that animals have adequate amounts of grass or hay as a basic food, in addition to the supplement. Supplementation can be provided in the form of licks. Licks can be supplied in blocks or in a ready mixed meal. Licks often contain salt, which makes the animals thirsty, so it is important to make sure that they have access to water.

Animals that are fed properly are also generally more productive, producing more milk, growing faster and getting back in calf quicker after calving.

What is the importance of good hygiene practices?

Hygiene or cleanliness is an important part of keeping your livestock and yourself healthy. Germs and organisms that cause disease and illness can spread between sick and healthy animals if you are not careful. Some of the key cases where hygiene is important are discussed below.

To stop the spread of worms

Worms can spread between your animals so that those that are healthy become infected with worms from other animals that are already infected. There are some worms that can pass between different types of animals and even some worms that can pass between people and animals and the other way round. Tapeworms are one of the types of worms that spend different parts of their lives in different types of animals. There are two main types of tapeworms, firstly, those that pass between **pigs or cattle and people**, (see Figure 1) and secondly, those that pass between **sheep or goats and dogs** (see Figure 2).

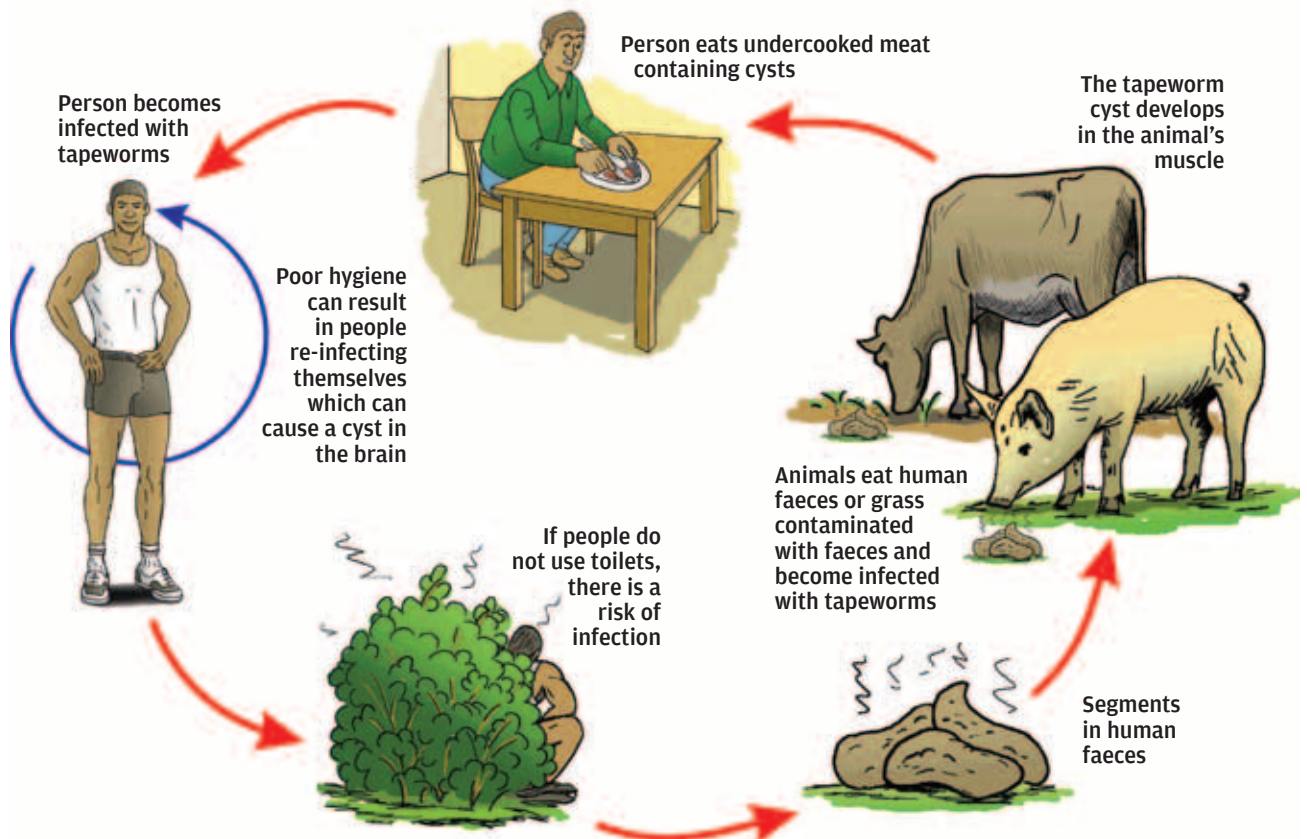


Figure 1: The life cycle of the tapeworm that passes between people and cattle or pigs

If we start by looking at tapeworms that pass between pigs or cattle and people, we will see that free-range pigs or cattle can pick up the tapeworm eggs while scavenging for food if they eat human faeces that are contaminated with tapeworm eggs. People in turn can pick up tapeworms if they eat undercooked pork or beef from infected pigs or cattle. From this it is clear that we must do two things to control the tapeworms and prevent infection:

- ✓ Make sure that we cook meat very well so that we will not become infected with any tapeworms.
- ✓ Make sure that we use toilets and/or confine pigs or cattle so that they cannot have access to human faeces.

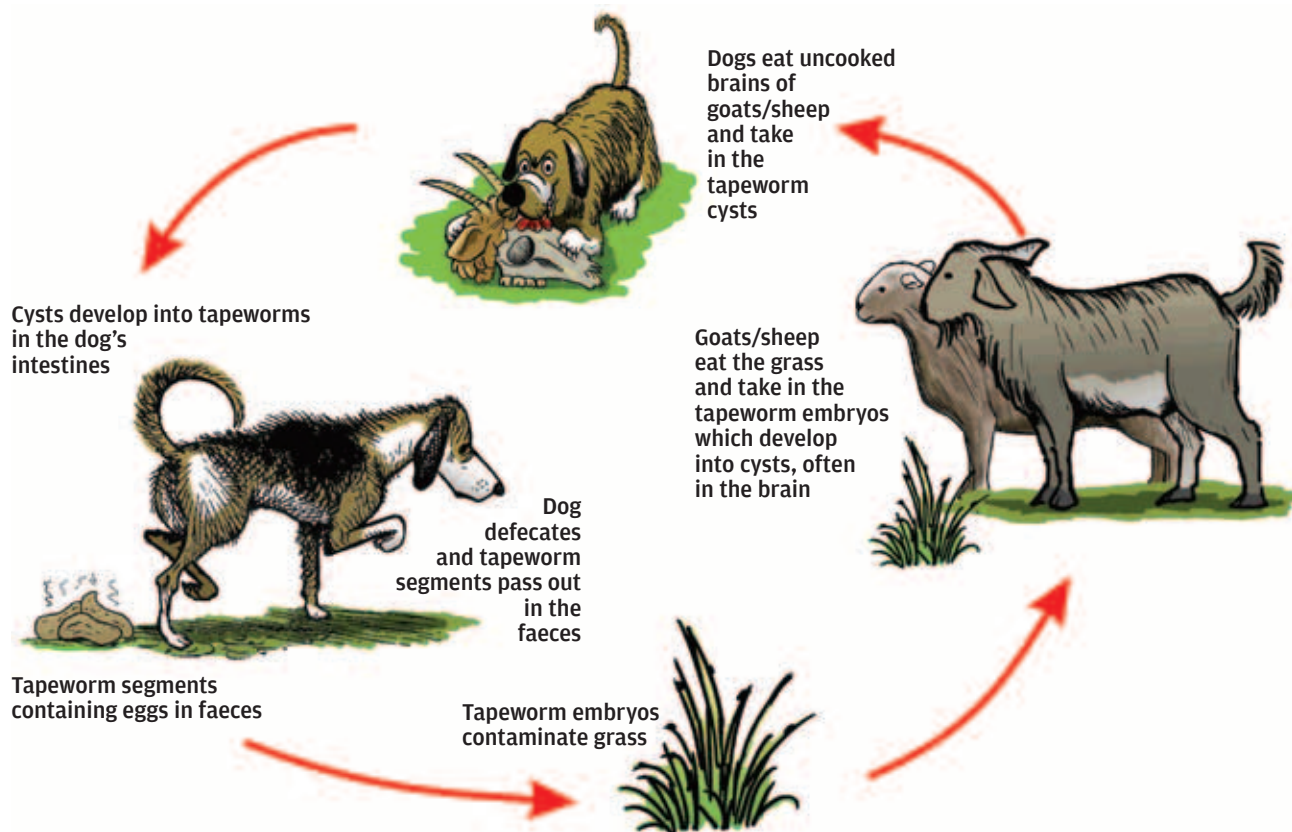


Figure 2: The life cycle of the tapeworm that passes between dogs and sheep or goats.

We also need to find ways to prevent tapeworms from moving between dogs and sheep or goats. If dogs are given uncooked meat, especially the heads and brains of sheep or goats, they sometimes become infected with tapeworms. They then contaminate the environment with eggs when they defaecate. Grazing sheep and goats then become infected when they graze contaminated grass and become infected with the tapeworm eggs, which develop into round, fluid-filled bags called bladder worms. The bladder worms sometimes lodge in the sheep's or goat's brain and this causes them to show brain damage (such as walking in circles).

In order to prevent this happening to your sheep and goats:

- ✓ Never feed the undercooked/uncooked brain or head of sheep or goats to dogs
- ✓ Deworm your dogs regularly (at least twice a year).

To stop the spread of disease

Many diseases are caused by germs that can spread the disease if we are not careful. For example, if we treat an abscess on an animal then we need to take action to dispose of the pus by burning or burying it so that it does not contaminate the environment and cause abscesses in other animals.

It is also important to remember that fetuses and afterbirth from animals that have aborted could be full of the germs that caused them to abort, and if we leave them lying on the ground they can contaminate the environment and affect other animals. It is important that aborted fetuses and afterbirth are disposed of by burning.

In order to stop the spread of diseases between animals you should also wash your hands with soap and water after handling a sick animal. In the same way, you should also wash your hands between each cow that you are milking in order to prevent the spread of mastitis.

Even more importantly, you need to stop the spread of germs and disease from the animals that you handle to yourself. If you are handling sick animals or aborted fetuses, you should wear gloves or cover your hands in a plastic packet to prevent yourself from touching the infected item. To prevent further spread of the disease, you should burn the gloves once you have finished your task.

If you do not have gloves, then you should at least make sure that you wash your hands with water and soap once you have finished handling the animal and definitely before you handle any food or shake hands or touch someone else.

2 Sicknesses/Diseases

This section looks at different causes of disease and how you can tell what might be causing the animal to get sick.

Why do I need to understand what causes diseases?

A farmer who knows what has caused an animal to get sick will also know how to treat that animal correctly or will find it easy to get advice on how to treat the animal.

By knowing what causes a disease, the farmer is better able to know what risk there is for his or her animals. For instance, if animals are infested with lots of ticks they are more likely to encounter diseases that are caused by ticks – although even a single tick bite from an infected tick can cause a disease such as Redwater.

Knowing what causes disease also helps a farmer to decide whether a sick animal will put his or her other animals at risk. A cow that has diarrhoea, for example, has probably been infected with a germ that will come out in the faeces and can contaminate other cows. Knowing this, a farmer may want to treat diarrhoea early in his or her herd and isolate affected animals to prevent the spread of the disease and the loss of young animals especially.

What causes sicknesses/diseases?

An animal can only get sick if something causes it to get sick. There are three main causes of disease in animals: germs such as bacteria and viruses, parasites such as ticks, lice and worms, and diseases of body functions, such as Milk Fever and Ricketts.

Germs

There are millions of different kinds of germs that can cause many different kinds of disease. These germs live all around us in the air, water and soil but are so small that we are not able to see them with our eyes. The immune systems of animals work most of the time to stop these germs from causing disease but they cannot fight them effectively when there are a lot of one kind of germ in the area where the animals stay or if an animal's immune system has been weakened. Under these conditions, the animals have a greater chance of becoming sick with the disease that the germs cause.

Sick animals and people have many germs inside them, which is what has caused them to become sick. They can spread these germs to other animals and

sometimes people through saliva, breath, faeces or pus, depending on the kind of germ. With some diseases, like those caused by ticks, the disease spreads when a tick from an infected animal bites another animal.

Some diseases caused by germs can be treated easily with medicines if the farmer is able to identify what is wrong with an animal. However, there are some kinds of diseases that Western medicine is not able to treat once the animal is contaminated. With some of these, the animal can develop an immune response once it has the sickness that prevents it from getting too sick in the future. However, it is best with many of these diseases to prevent the animal from becoming sick by using a vaccination. Some of the germs causing these diseases are so dangerous that if an animal becomes sick from these germs, government says the farmer should slaughter that animal (for example Foot and Mouth Disease). Indeed, some are so serious that the carcasses of these animals should not be eaten but burnt and buried to prevent the germs from spreading to more animals or even to people, which is the case with diseases such as Anthrax.

Parasites that live inside and on the outside of your animals

There are parasites that live on the outside of animals, such as ticks and lice – they are known as external parasites. There are also parasites that live inside the animal, such as worms – these are known as internal parasites.

Parasites such as ticks, worms and lice are not the same as germs as they are generally big enough for us to see. There are some parasites that are too small to see, such as the mites that cause skin diseases such as mange and sheep scab.

Parasites cause animals to get sick in many ways, including:

- They feed off the animal's blood causing anaemia.
- They cause damage to the animal when they bite it. Ticks biting a cow's udder can cause damage to the udder, sometimes destroying it so that the cow cannot feed her calf. Different types of ticks cause different levels of damage. For example, Bont ticks, have very long mouth parts that cause abscesses, while Brown ear ticks infest livestock very heavily, resulting in extreme damage. Mange mites cause skin irritation, which results in a loss of hair.
- Some parasites carry germs that go into the animal as the parasite is feeding. It is then these germs that cause the animal to get sick. Ticks are like a taxi for the germs that cause Redwater, Heartwater and Gall-sickness in cattle and goats.

See Figure 3 on the facing page for pictures of some ticks.



Figure 3: Bont ticks (left) transmit Heartwater while Blue ticks (right) transmit Redwater.

(Source: Jenny Turton (1999) Tick borne diseases in ruminants) – <http://www.nda.agric.za/docs/Ticks/ticks.htm>

How can I control parasites?

Parasites can be controlled with:

- Stock remedies and medicines (for example tick dips and dewormers)
- Preventative management.

Controlling parasites with stock remedies and medicines

Parasites can be controlled by treating your animal with stock remedies. There are different products available – they include dips for ticks, dewormers for worms and other internal parasites and injectable products that kill both ticks and worms.

If you do not use the remedies correctly, they stop working properly and do not kill the ticks or worms that they are supposed to control. This is because the parasites build up resistance to the product. You must prevent this happening by using them at the correct strength – so always follow instructions carefully and do not underdose or use weak dip mixture. If you see that the dip or dewormer is becoming less effective at killing the parasites, you should change to a product that contains a different active ingredient.

It is recommended that in order to prevent worms becoming resistant to chemicals, you should only treat animals that show symptoms of being infected. There are five key signs of worms that you can look for in sheep and goats:

- Pale eye membranes (e.g. Wireworms)
- A swelling below the jaw (e.g. Flukes)
- Diarrhoea (any worms)
- Poor condition (e.g. Bankrupt worm)
- A nasal discharge (e.g. Nasal bot)
- Segments in the dung (e.g. Tapeworms).

Use a broad-spectrum product if you see one of these signs in your animal. You should also check your animal after a few days to see whether the treatment has been effective.

Stock remedies are useful to treat animals in order to get rid of parasites, while medicines can be used to treat animals that are sick with diseases that are carried by parasites. If an animal does become ill from a tick-borne disease, it must be treated otherwise it will die.

Preventative management to control worms

Medicines by themselves cannot control all parasites. It's also important to prevent by using measures such as breaking their lifecycle. With worms in cattle, sheep and goats, you can break the lifecycle by rotating grazing camps to prevent worm infestation.

Worms lay eggs that pass out in the faeces and hatch. If you dose your animals and prevent them from grazing on areas where the worm eggs have just hatched, they will not become re-infected. Once you have dosed them, you should always try to move them to a "clean" area where they will not be re-infected. Other ways of preventing worm infection in cattle, sheep and goats include deworming dogs and people regularly. See Figure 4 for diagram of lifecycle.

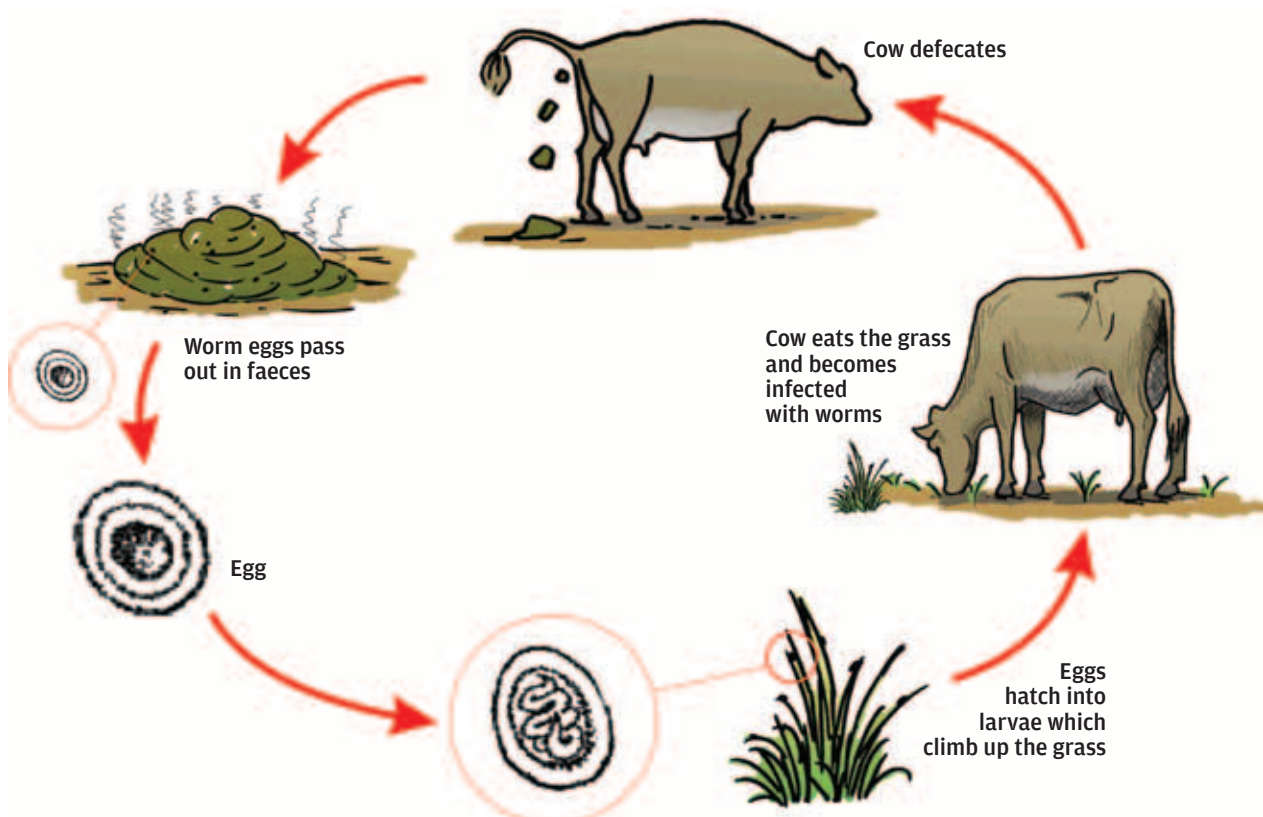


Figure 4: Life cycle of a round worm.

Preventative management to control ticks

Understanding the life cycles of different ticks also helps you understand not only how to control them more effectively, but the risks that they pose. For example, some ticks spend most of their lives on one animal (e.g. Blue ticks), while others move from one animal to another during their lifespan (e.g. Bont ticks) – they are said to have more than one host. Such ticks can spread disease from one animal to another. With ticks that move from one animal to another, it is important that your neighbours also control ticks on their animals. See Figure 5 for some key tick control measures.



When mixing dips make sure that they are the correct strength because weak dip will not work and dip that is too concentrated could burn the skin or even kill the animal



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Don't let this happen to your animals! The udder of an animal in this condition will be severely damaged, it is likely to become sick and it might even die!



Try to use dips that do not kill oxpecker birds as they help control ticks



Try not to dip or use pour-on dips on young calves (less than 6 months old) because they need to be bitten by ticks in order to be protected against the diseases that ticks carry.

Rather apply tick grease to parts of the calf that are heavily infested with ticks, especially the udders of heifers.



Make sure that you use the correct dose when applying a pour-on dip – Do not underdose or the dip will stop working and do not overdose as this could damage the skin or make the animal sick!

If ticks are a big problem in your area, then you should dip all your livestock in late July, again in October and then again in November. This will prevent an 'explosion' of ticks. You will still need to dip if you see lots of ticks on your livestock.

Figure 5: Key tick control measures.

It is also important to apply dip to cattle that have died from a tick-borne disease because all the ticks on that animal will be infected with the disease. By dipping the animal, the farmer will prevent these infected ticks from biting other cattle and infecting them with the disease.

Animals can also develop an immune response to some of these tick-borne diseases over a period of time. This happens with livestock when they are allowed to have some ticks on them but not so many that they become very ill. To help develop this immunity, the farmer should not dip young calves until they are 6 months of age except for the udders of heifers or other heavy tick infestations. Livestock owners should also not dip their animals too often as it is better for them to have some ticks, but not so many that they cause damage.

Indigenous breeds of livestock are hardier and less susceptible to ticks and tick-borne diseases. However, if moved into a new area with different challenges, even indigenous animals may still get sick and die.

What kinds of symptoms of diseases are there?

Symptoms help us to identify what is causing our animal to get ill. Symptoms of disease could for example be a high temperature, red urine and anaemia. A farmer will look at the symptoms as well as other factors to help assess the cause of illness.

These factors can include:

- The number of ticks
- The time of year (when there are suddenly a lot of ticks or very green grass)
- Whether the animal has suddenly become ill or has been slowly getting sick over time
- Whether the neighbors have had any sick animals
- The state of the dung or faeces.

Some diseases cause animals to have symptoms that are visible and easily recognisable. For instance, an animal with Redwater will produce red urine.

However, some diseases do not show visible or easily identifiable symptoms. Sometimes an animal just doesn't want to eat and is lazy to move around. This animal might be sick but it is difficult to know what is causing it to get sick because its symptoms are not specific. This is when factors help the farmer to decide what the symptoms might mean. Over time, farmers will learn more and more about

using symptoms and factors to help determine what disease an animal has and will get better at diagnosing diseases in time.

Many farmers and vets can tell very quickly what caused an animal to get sick once the animal has died. They can cut open the animal and look at the brain or liver or stomach and identify the type of disease that killed the animal. This helps confirm a diagnosis.

Warning!

Anthrax is one disease where vets advise farmers not to cut open the animal and just to bury the carcass. By cutting open the carcass of an animal that has died of anthrax, the farmer is allowing all the anthrax germs in the carcass to escape onto the ground ready to contaminate other animals and humans at another time.



How do I take my animal's temperature?

If you think your animal is sick, you should take its temperature. The normal body temperature for most animals is between 38 and 39.5°C. If the animal's temperature is higher than this, then it shows that the animal is sick and you will need to treat it appropriately. If the temperature is lower than normal, it shows that the animal is very sick and likely to die.

You need to have a digital thermometer in order to take the animal's temperature. For most animals, you take the temperature by inserting a thermometer into the animal's rectum. You must wait a minute before reading the thermometer. Remember to be gentle when inserting the rectum so as to prevent causing any wounds that can result in infections.



Figure 6: How to take my animal's temperature.

How do I check for anaemia?

A number of different diseases and parasites cause anaemia. Anaemia is a condition where the blood of the affected animal is not as thick as it should be. Some diseases break down cells in the blood, leading to anaemia. Some worms in the animal's intestine feed on the animal's blood resulting in a loss of blood, which in turn causes anaemia.

How do I check for anaemia in cattle, dogs and horses?

Anaemia is a symptom of a number of tick-borne diseases that affect horses and dogs (e.g. Biliary) as well as cattle (e.g. Redwater or Gall-sickness). It is possible to check the animal's eye membranes and gums to see if it is anaemic. In female animals, you can also check the colour of the membranes of the vulva.



Figure 7: Checking anaemia by looking in the eyes.

How do I check for anaemia in goats and sheep?

In goats and sheep especially, anaemia is often caused by a certain type of roundworm called wireworm. Heavy infestations of wireworm can result in the death of the animal (It is important to know that there are other types of worms that do not cause anaemia, but which still need to be controlled).

You can look at the inner membranes of the eye to see whether the animal is anaemic (Figure 7). If they are bright pink or red, the animal is healthy, but if they are pale pink or even white, then it is anaemic and needs to be treated for worms (Figure 8).



Figure 8: The colour of the membranes of the eyes shows the level of anaemia – totally white (1) and slightly pink (2), which require treatment, and pink (3) and very red (4), which do not require treatment

(Malan F.S., Van Wyk J.A. and Wessels C.D., 2001. Clinical evaluation of anaemia in sheep: Early Trials. *Onderstepoort Journal of Veterinary Research*, 68, 165-174.).

3 Treatment of Sicknesses/ Diseases

What kinds of treatment are available?

Some treatments prevent the animal from ever getting the disease while others treat the disease once the animal is already sick.

Vaccinations prevent animals from getting the disease by giving the animal a small and weakened amount of the germ that causes the diseases. This allows the animal to develop its own immunity to fight the disease in the future but does not put the animal at any risk of getting too sick. Some vaccines must be given every year, like the vaccine for Black quarter and Lumpy Skin. Others can be given once only and the immunity lasts for the animal's whole life, such as the vaccine for Contagious Abortion.

Farmers can enquire from the state veterinarian what vaccines are provided by government for free to assist them in controlling certain diseases. For example, the vaccine Blanthrax vaccinates against Black Quarter and Anthrax, while the CA vaccine vaccinates against Contagious Abortion.

Some diseases can be prevented through prevention management. For example, a farmer can reduce the risk of cattle getting Redwater by dipping them regularly with the right quantities of dip before, during and after the tick season. Prevention management can also be used together with other treatments. For instance, a farmer can move his or her cattle to new grazing areas where there are no worms and dose them for worms every few months to prevent the poor condition worms cause, or they can check the colour of the inner membrane in the eye, in order to treat only those animals affected.



Figure 9: Some simple equipment that you can use to dose your goats for worms.

This section looks at different kinds of treatments that Western medicine can offer. Many farmers use traditional medicines very successfully. Western medicine can contribute to the health of these farmers' livestock. New farmers must make sure they understand how traditional and Western medicine works, how much medicine should be given and how to give it before using any medicine.

This section gives advice about how to use Western treatments and why they must be used only in the way directed.

If a disease cannot be prevented by vaccination or preventative management, it can usually be treated with medicine. There are many different kinds of medicine and it is important that the farmer knows what is wrong with his or her livestock before buying and using medicine. A very commonly used medicine that is not a vaccine is an antibiotic, such as Terramycin. These are used for illnesses that will come back from time to time, like Mastitis or sores that have a lot of pus in them.

What must you think about when treating an animal?

You will either be preventing your animals from getting sick or you will be treating an animal that is already sick. If you are treating a sick animal, you must have some ideas about what is wrong with it in order to treat it effectively. Once you have some ideas about what is causing your animal to get sick, you need to think about the following issues:

- **What drugs are required?** Make sure you buy or obtain the correct medicines to treat the animal. The incorrect medicine will not help the animal.
- **How much medicine must be given?** Most medicines are given according to the weight of the animal. A small animal is given a small amount and a big animal is given more. It's important to know the approximate weight of the animal you are treating so that you can work out how much medicine the animal needs. Too much of some medicines, like the treatment for an animal with Redwater, can very easily kill your animal while other types of medicines will stop working if you don't give the animal enough to kill the germs.

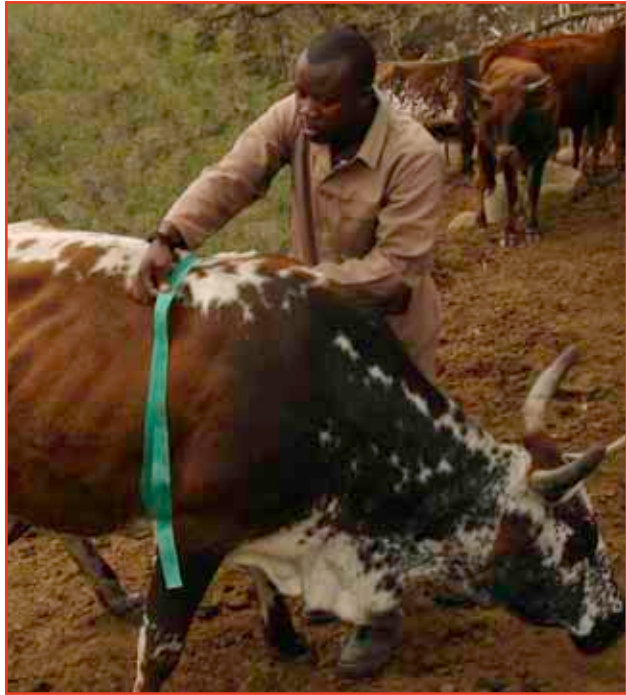
A farmer can purchase a weight band that will give him or her a way of measuring how heavy the animal is. Weight bands are available for cattle, goats, pigs and horses. The band is placed around the body of the animal behind the shoulders (heart girth) and the measurement is read from the band, like a tape measure.

At the end of this manual is a guideline table that will give you an idea of how much animals weigh and how much medicine you need to give to a particular animal.



Figure 10: Reading a weight band to see how heavy your goat is.

Figure 11: Using a cattle weight band to determine the weight of the animal.



- **How is the medicine given?** Different medicines are given in different ways. Some medicines can only be given in the mouth, others require injections and others must be placed on the outside of the animal's body. It's very important to know how the medicine is given because some medicines that can help your animal if they are put on the skin can poison your animal if it is put in its mouth.

- **Where do I inject my animal?** There are three types of injections that can be given depending on the medicine you are using.

The first type of injection is an **intramuscular** injection, which must be given deep into the muscle of the animal. If more than 20ml is needed at once, the animal must be injected in two different places. This injection is usually given on the rump of the animal away from the spine near the back where there is a lot of muscle.



Figure 12: Where and how to give an intramuscular injection – this is an injection right into the muscle.



The second kind of injection is one that is given just below the skin. This is known as a **subcutaneous** injection. The needle can be bent slightly and the skin squashed between the fingers to raise it so that the needle can slide under the skin without going into the muscle. This is usually given on the neck of the animal where some loose skin can be found.

Figure 13: How to give a subcutaneous injection – this is an injection just under the skin.

The third type of injection is **intravenous**, which is given straight into a vein. This method gets the medicine all over the body very fast. However, it is a difficult injection to give because veins are difficult to find in a sick animal and you must be very careful not to push the medicine in too fast. This can kill the animal. However, if the animal is so sick that it is already lying down, then the farmer should give an intravenous because the other injections may take too long to work. There are big veins on the animal's neck and near a cow's udder (Farmers can ask a state vet for demonstration or assistance with regard to this type of injection as it can be deadly if not done properly – it is also only suitable for certain types of medicine).

- **What kind of needle and syringe should I use?** Always use very sharp needles and syringes that are either new or have been boiled in water to sterilise them. A dirty needle will give the animal you are injecting the disease of the animal it was last used on. A dirty syringe could contaminate the medicine you are trying to give your animal. In this way, instead of treating your animal, you could make it even sicker. Boiling needles and syringes allows the farmer to re-use them safely. However, they should be boiled immediately after being used. The farmer must also watch that the needle does not get rusted, which happens after it's been boiled more than three times. A needle that is rusted must be thrown away carefully so that children and other animals cannot touch it.

Vaccinations should be given with a new needle so that the rust does not affect the vaccine.

- When injecting cattle, use a 20cc syringe and an 18 gauge needle.
- When injecting goats, use a 10cc syringe and an 18 gauge needle.

- When injecting chickens, use a 2cc syringe and a 20 gauge needle.
- When injecting pigs a 20cc and an 18 gauge needle for sows, boars and gilts.
- When injecting pigs a 10cc or 2cc and an 18 gauge needle or 20 gauge needle for piglets, porkers and baconers (Dependent on size of pig).

The best needle and syringe for vaccinations, which are usually subcutaneous, is a steel half inch needle with a 15 gauge Roux syringe. This makes vaccinating a much easier task. However, vaccinating can be done with the needles and syringes suggested above.

What medicine should I buy?

There are many things to think about when buying medicine. The following are important questions to ask: Which medicine do I need for the diseases my animals get? Is the cheapest medicine the best one to buy? Does this medicine have to be kept in a fridge? When will this medicine expire? How many doses does this bottle have in it?

There are two types of antibiotics. The first type is known as a short-acting antibiotic. It enters the blood quickly but does not remain in the blood for much time and requires an injection to be given every day for at least three days. Short-acting antibiotics must be given to animals sick with diseases that develop very fast, like Heartwater. The second type is known as a long-acting (LA) antibiotic, which enters the blood very slowly and works for longer. In some instances, a single injection may be enough, in other cases it may be necessary to repeat the injection after 3 days. Long-acting antibiotics can be given to animals that are sick with diseases that get worse slowly, such as Pneumonia or Mastitis.

Sometimes when a farmer buys medicine like a vaccine, the shopkeeper will give him or her a packet of ice in which to take the medicine home. This means that the medicine cannot be kept out of a fridge for more than a few minutes at a time. If the farmer does not have a fridge to store this medicine, it must be given to the animal that same day. Medicine that needs to be kept cold cannot be kept in a freezer or it will stop working.

Many shops sell bottles of medicine that can treat many cattle but have to be used within a fairly short time after opening. The farmer will realise that he or she may be wasting money buying such medicine knowing that there are few cattle to treat. In this situation, the farmer must ask the shop if it can sell a portion of the medicine. However, most shops will not do this. Another option is to share a bottle of medicine with enough neighbours so that it is all used before it expires.

Therefore, when buying medicine, consider the following:

- How much medicine must be given in one injection?
- How long does one injection last?
- Which type of medicine is needed?
- Can the medicine be stored in a cupboard or does it need a very cold place e.g. a fridge?
- How many animals can be dosed with the medicine in this bottle?
- When will this medicine expire?

Sometimes a disease will not be cured by the kind of medicine that you can buy at the cooperative and you may need to visit a vet to get a different kind of medicine that only a vet can sell.

How do I store medicine?

The most important thing about storing medicine is that the farmer must make certain that small children cannot go anywhere near the bottles and containers. Some of them are very dangerous poisons and they will cause children to get sick and even die. They should therefore either be stored in a cupboard out of the children's reach or in a cupboard or room that is kept locked at all times.

The next most important thing to remember about storing medicines is that too much light or sun will destroy that part of the medicine that works to treat the animal. Medicine should therefore be stored in a place like a cupboard in a room where no sun can shine on to it, e.g. Ivomec.

It is also important for the farmer to check expiry dates so that he or she does not give animals medicine that can no longer help them.

However, there are some medicines that require cold storage, especially live vaccines or vaccines that must be mixed with water. These must be kept either in a fridge or surrounded by ice in a cooler bag (*Note: They should not be kept in a freezer!*). They must also be kept in the shade and not in the sun on the day the farmer is preparing to use them if he or she is not ready to inject immediately.

It is also important that containers containing medicine are clearly marked, especially if you buy small amounts of medicine from someone and they are not in the original container. They need to be marked with the name of the product as well as the date when it will expire, which you will get from the original container.

How do I know which animals keep getting sick?

Some form of identification of individual animals is important to check if treatment has worked, so that you can keep a record of which animals you have treated and to see if the medicine is working. If your records show that you are spending a lot of money on a particular animal, you might decide to sell it.

How should I handle and use vaccines?

General tips when vaccinating cattle, sheep and goats

- ✓ Make sure that the vaccine you buy has been transported and stored correctly or it will not work properly or at all
- ✓ Use the correct method of administration
- ✓ Once mixed, use the vaccine immediately
- ✓ Check withdrawal period (i.e. recommended time between vaccination and slaughter of the animal)
- ✓ Sterilise syringes and needles by boiling in water for 15 minutes before use
- ✓ Ideally you should use a separate needle for each animal to prevent spread of disease
- ✓ If vaccinating pregnant animals, check the vaccine directions carefully because it might result in abortion
- ✓ Do not vaccinate animals that are sick
- ✓ Always give full set of injections where applicable (African Horse Sickness, Bluetongue) and at recommended intervals
- ✓ Store vaccines in a refrigerator – do not freeze!
- ✓ Do not use after expiry date printed on the bottle
- ✓ For vaccinations that come as a freeze dried pellet, use only the supplied liquid to dissolve them – do not use tap water as the chlorine will kill the vaccine
- ✓ Make sure vaccine is not exposed to high temperatures or sunlight
- ✓ Administer vaccine as instructed (subcutaneous or intramuscular injection).

General tips when vaccinating chickens

In addition to the tips above, you should also follow the following rules:

- ✓ Vaccinate all chickens on the same premises at the same time
- ✓ Do not open and mix vaccine until you are ready to vaccinate

- ✓ Do not use metal dishes for mixing vaccine – use plastic dishes
- ✓ Use cold, clean, unchlorinated water (not tap water) for mixing vaccines
- ✓ Provide sufficient containers so that all of the birds can drink at one time
- ✓ Take water away from the chickens the night before you plan to vaccinate them so that they become thirsty – then vaccinate them in the morning
- ✓ Open the vaccine bottle under the water
- ✓ Avoid exposing the vaccine mixture to sunlight
- ✓ Do not provide any other drinking water until all of the vaccine mixture has been consumed
- ✓ Add non-fat dry milk (skim milk powder) to the water if you are using chlorinated water.

How do I transport vaccines?

Vaccines need to be kept cold but can also be damaged by freezing. If you are carrying a vaccine home from the shop then it is best to wrap it in newspaper, put it in a plastic bag and then put it in a cool box with a frozen ice pack.

What basic medicines and equipment should I always have on hand?

It is important that you have easy access to the basic medicines and equipment so that you can keep your flock healthy and treat a sick animal promptly so as to prevent death.

Essential equipment

The following equipment is essential for healthcare of your animals:

- Knapsack sprayer – to spray animals to control external parasites, mainly ticks
- Scale or weight belt – to determine how much your animals weigh
- Rectal digital thermometer – to take your animal's temperature in order to diagnose infection
- Syringes (5cc, 10cc, 20cc) – size depending on animals you are injecting
- New needles – for giving injections (18 gauge for cattle, 20 gauge for goats/sheep)
- Plastic gloves or plastic packets – for handling aborted foetuses or abscesses
- Dosing nozzle.

The following items are recommended for general management:

- Burdizzo – to castrate male animals
- Elastrator – to castrate young lambs and kids (less than 10 days of age) or dock the tails of young lambs
- Ear tag applicator – to insert ear tags
- Hoof trimmers – to trim overgrown hooves
- Tattoo applicator – to tattoo pigs, sheep and goats
- Branding tool – to brand cattle
- Dosing gun – to give de-wormers to cattle, sheep and goats
- Large syringe for drenching/dosing sheep/goats (20cc, 50cc)
- Long plastic gloves for assisting sows or cows having difficulty calving/farrowing
- Soft tube – for emergency feeding of animals mainly kids and lambs
- Feeding bottle – for feeding orphans or weak lambs, kids or piglets.

The following items are needed specifically by pig farmers:

- Teeth clipper – to cut piglets' teeth
- Tail docking scissors – for tail docking in pigs
- Colostrum (e.g. Immulin P) for assisting in cases where some piglets did not receive any from the sow.

Key medicines

The farmer should always have these medicines on hand:

- Antibiotic eye powder (can also be used as a wound powder)
- Broad-spectrum de-wormer
- Dip (pour-on or conventional one to be mixed with water)
- Wound spray with fly repellent – to treat wounds, ears after tagging, etc
- Injectable antibiotic such as Terramycin or Hi-Tet
- Redwater injectable treatment
- Sulphur-based injectable drug – to treat Coccidiosis, Pneumonia or foot-rot
- Iodine spray – for external treatment of Fowlpox, wounds, footrot and navels.

4 Information About Specific Sickesses/Diseases

Sicknesses/diseases that affect many different types of livestock

Disease	Symptoms	Prevention	Treatment
Foot and Mouth Disease   	Lesions (sores) in the mouth and on the feet, salivation and lameness.	Vaccination is only permitted by government under certain circumstances.	No treatment – cases must be reported immediately and affected herds/flocks may be vaccinated or slaughtered to prevent the spread of the disease.

Figure 14: Sores in a goat's mouth and on a cow's hoof'.

Disease	Symptoms	Prevention	Treatment
Lung infections 	Coughing, nasal discharge and difficulties with breathing.	A multi-component vaccine can be used to prevent certain types of lung infections in sheep and goats	Sick animals can be treated with an oxytetracycline antibiotic such as Terramycin or Hi-Tet. Hi-Tet 200 LA dosage: <ul style="list-style-type: none"> • Intramuscular injection. • 1ml/10kg livemass. • Repeat after 3 days if necessary
Abscesses (Amathumba)  	Swelling that is hot, red and painful. Sometimes, they burst open and ooze pus.	Control excess ticks and general hygiene.	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. Use a boiled razor blade to cut the abscess. Then syringe warm (boiled) water with a lot of salt in it (1 tablespoon of salt in a cup of water) or iodine into the wound. Spray daily with a wound aerosol such as Woundsept Plus. Keep the wound open to allow it to drain. Bury or burn the material used to wipe the pus. This can infect other animals and people. Always boil the razor blade before using it. <div data-bbox="1268 212 1468 817">  <p>WARNING! If an animal has several very bad abscesses or gets abscesses often, it should be culled.</p> </div>

Figure 15: An abscess on a goat's jawⁱⁱ.

Disease	Symptoms	Prevention	Treatment
Bloat 	The animal's stomach swells It becomes uncomfortable and may lie down and cannot breathe and may die.	Do not allow animals to graze green lucerne and clover or other plants that cause them to bloat. They must be introduced VERY slowly 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.	Make the animal drink cooking oil (500 ml for a cow) 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.

Disease	Symptoms	Prevention	Treatment
<p>Mastitis (Ukufa kwemibebe)</p> <div></div> <div></div> <p>Figure 16: Chronic mastitis ⁱⁱⁱ.</p> <div><p>WARNING! Do not drink the milk from cows that have been treated – adhere to the recommended withdrawal period.</p></div>	<p>One or more of the quarters is swollen and painful.</p> <p>Udder produces either a brownish watery fluid or watery milk containing white or yellow clots or pus.</p> <p>Can cause the death of the quarter or even the animal if not treated.</p> <p>Once a cow has had Mastitis, it is more susceptible to getting it again.</p> <p>Remember that too many ticks on a cow or heifer's udders can also ruin the udder. The udders of cows and heifers must be dipped especially regularly when there are a lot of ticks.</p>	<p>Infected quarters are a serious source of infection for other quarters and cows. So, milk the cow/s with Mastitis after all the other cows have been milked. Also, milk the infected udder after milking the others. This helps stop Mastitis from spreading.</p> <p>Wash hands and udders carefully every time you milk.</p> <p>Always milk cows that have more milk than the calf can drink. A swollen udder with too much milk will cause mastitis.</p> <p>Treat wounds on the udder with Iodine spray.</p> <p>Allow the calf to suckle after milking as this helps prevent Mastitis.</p>	<p>Insert an intra-mammary injection like Pencilox Blue into the infected teat.</p> <p>To insert medicine into the teat: Milk the cow out completely. Clean the teat of the affected quarter well with methylated spirits or hot water. Use one tube per teat. Push medicine deep into the udder by massaging the quarter upwards. Treatment can be repeated for three consecutive milkings if necessary.</p> <p>You can also inject the cow with a long acting antibiotic such as Terramycin LA or Hi-Tet 200 LA.</p> <p>Hi-tet 200 LA dosage:</p> <ul style="list-style-type: none">• Intramuscular injection.• 1ml/10kg livemass• Repeat injection after 3 days if necessary.• Remember to inject not more than 20ml into one site and the other half in a new site.

Disease	Symptoms	Prevention	Treatment
<p>Scours or diarrhoea</p>   <p><i>Figure 17: Signs of diarrhoea.</i></p>	<p>Diarrhoea can be the symptom of a disease.</p> <p>There are many different causes of scours and each one can cause a different kind of runny stomach. They can include:</p> <ul style="list-style-type: none"> • Smooth, yellow diarrhoea • Smooth, white diarrhoea • Whitish diarrhoea with lumps of thin skin in it • Red or brown diarrhoea, which may mean blood in it. 	<p>Regular treatment for worms will prevent scours caused by worms.</p> <p>Consider vaccinating against paratyphoid. This will help prevent diarrhoea in slightly older calves, 1-2 months old.</p> <p>Alternatively, vaccinate mother with E-Coli vaccine a month before calving to help prevent calves of less than one month getting diarrhoea.</p> <p>In hand-rearing calves, kids and lambs, clean bottles, buckets etc well and keep good general hygiene measures.</p>	<p>A good general treatment is a mix of one spoon salt, 8 spoons sugar in one litre of clean, warm water.</p> <p>For young animals that have not been weaned, feed this mixture twice a day instead of milk (but not for more than three days).</p> <p>If scours is due to an infection of the gut (blood in the scours), then inject with a long acting antibiotic or give a dose of terramycin powder mixed with water.</p> <p>Hi-Tet 200 LA dosage:</p> <ul style="list-style-type: none"> • Intramuscular injection. • 1ml/10kg livemass. • Repeat after 3 days if necessary. <p>Terramycin powder dosage:</p> <ul style="list-style-type: none"> • Mix with water and give as a drink. • 1 level teaspoon powder/7kg livemass. • Repeat daily for 3 to 5 days. <p>Immodium tablets for 3-5 days</p> <ul style="list-style-type: none"> • Calves: 2 per day • Kids: 0.5 per day

Disease	Symptoms	Prevention	Treatment
<p>Coccidiosis</p> 	<p>The live animal This disease normally affects young animals. The animal produces slimy, bloody scours because the disease attacks the lining of the stomach, intestines, lungs and mouth. The animal gets very thin and weak and the inside of its eyelids, mouth and vagina are white because it is losing blood.</p> <p>The dead animal Tiny, greyish-white spots are often visible in the mucous membrane of the small intestine. Guts filled with fluid and blood.</p>	<p>Often to do with wet environment, so keep dry.</p>	<p>Give Sulfazine 16% as a drink. Sulfazine 16% dosage:</p> <ul style="list-style-type: none"> Initially give 14ml/10kg livemass Then give 7ml/10kg daily for two days <p>Other treatments Immodium for 3-5 days</p> <ul style="list-style-type: none"> Calves: 2 tablets per day Kids: 0.5 tablets per day <p>Vecoxan:</p> <ul style="list-style-type: none"> Lambs/kids: 1ml/2.5kg livemass body weight at about 4-6 weeks of age (Treat all lambs of the flock). Calves: 1 ml/2.5kg livemass administered as a single dose (14 days after moving into a potentially high risk environment).

Sickness/diseases mainly affecting cattle

Disease	Symptoms	Prevention	Treatment
<div>Anthrax</div> <div></div> <div><div>Warning! This disease affects people.</div></div>	<div>The live animal The animal often dies suddenly, with no symptoms having been seen even a few hours before.</div> <div>The dead animal Thick, dark blood is seen coming from the animal's nostrils and anus. This disease can infect people so the carcass must be buried or burnt and not eaten. The carcass must not be cut open or it will release germs that affect the surrounding area.</div>	<div>Animals should be vaccinated with Blanthrax which will protect them from both anthrax and Black quarter.</div> <div>Blanthrax dosage:</div> <ul style="list-style-type: none">• Subcutaneous injection• 2 ml under the skin.• Repeat the injection once a year.• First dose at 6 months old if mother was vaccinated and less than 6 months of age if mother was not vaccinated.	<div>There is not normally enough time to treat the animal so prevention is essential.</div> <div><div>Warning! Do not open the carcass.</div></div>

Disease	Symptoms	Prevention	Treatment
<div><div>Contagious abortion (CA) / Brucella</div><div></div><div><div><div><div>Warning!</div><div>This disease affects people – symptoms include fever, sweating and weakness, but not abortions.</div><div>The vaccines can all infect people and should be handled very carefully!</div><div>Vaccination of heifers over 8 months of age requires permission from a state veterinarian.</div></div></div></div></div>	<p>The live animal</p> <p>This disease causes abortions in the herd. They normally occur when the foetus is 4 to 7 months old but in some cases the cow will actually produce a calf, which is weak and dies. The disease also commonly results in retained placentas and the afterbirth often appears abnormal.</p> <p>Long-term infection of cows sometimes results in the development of a watery swelling on one or both knees.</p> <p>Bulls may become infertile due to infection.</p>	<p>Heifers should be vaccinated.</p> <p>Brucella S19 can be administered to heifers of 4-8 months of age (once-off vaccination). It cannot be used in animals over 9 months of age or will interfere with the blood tests and will cause animals tested for CA to test positive (a false positive).</p> <p>Brucella S19 dosage:</p> <ul style="list-style-type: none">• Mix fluid with tablet• Inject 5ml subcutaneously <p>Alternatively RB51 can be used – this can be used in female animals of any age – but pregnant animals may abort.</p> <p>RB51 dosage:</p> <ul style="list-style-type: none">• Mix fluid with tablet• Inject 2ml subcutaneously• If heifers are vaccinated at 4-10 months and then given a booster at 12-16 months, annual vaccination is not necessary.	<p>No treatment is available.</p> <p>Infected cows must be branded and culled to prevent the infection of other cattle as well as people.</p>



Figure 18:
Aborted foetus ^{iv}.



Disease	Symptoms	Prevention	Treatment
<p>Black quarter / Quarter evil (Umkhonywana)</p>  	<p>The live animal</p> <p>Affects young cattle of 3 to 6 months the most. It never occurs in an animal older than 3 years.</p> <p>They become lazy, hot and then lame. One leg is usually swollen and it feels spongy.</p> <p>The sick animals will die quickly.</p> <p>Sometimes it looks as though the animal was struck by lightning on its leg.</p> <p>The Dead Animal</p> <p>Red-brown water leaks from the swellings. It smells like rotting butter. When the animal is cut open, its muscles look like bubbly, black sponge.</p>	<p>Prevention is vaccination.</p> <p>To prevent Black Quarter, young cattle of 6 months must be vaccinated with a vaccine like Blanthrax, unless mother is not vaccinated in which case vaccinate at 2-3 months and repeat after 1 month.</p> <p>Dosage:</p> <ul style="list-style-type: none"> • Subcutaneous injection • 2 ml under the skin. • Repeat the injection once a year until the animals is 3 years old. <p>Bury or burn the carcass to prevent the disease from spreading to other animals. The meat can also cause humans to get sick.</p>	<p>Treatment is not often successful. The farmer can inject the animal with a penicillin injection, which must be obtained from a veterinarian.</p>

Figure 19: The spongy appearance of muscle in an animal with Black quarter¹.

Disease	Symptoms	Prevention	Treatment
<p>Vibriosis</p> 	<p>This is a venereal disease of cattle that is mainly transmitted during mating. It is a bacterial disease that causes temporary infertility due to early abortions of foetuses. The abortions are often not noticed and the farmer only notices that there are fewer calves being born than is expected. Infected cows will become pregnant again after 5-6 months and will then be immune against the disease although they may still spread the disease to other animals in the herd. Bulls are not affected although they spread the disease from one cow to another.</p>	<p>Prevention is vaccination. Vaccinate with Vibrio/Leptoform 5 vaccine. Dosage is 2ml/animal (intramuscular injection) Vaccination should take place 1-2 months before the breeding season or before new animals are introduced into the herd. It is recommended that all breeding heifers and cows be vaccinated annually. The vaccine must be stored in a refrigerator.</p>	<p>Antibiotics can be used to treat infected cows, but it is far better to prevent the disease than to treat it.</p>

Disease	Symptoms	Prevention	Treatment
<p>Redwater (Umbendeni)</p> 	<p>The live animal</p> <p>It has a very high temperature (40-42°C) and doesn't want to eat. It is tired, often lying down and breathes very fast.</p> <p>In the advanced stages of the disease, the inside the mouth, the rims of the eyes and the vagina are pale or yellow instead of pink. The animal also produces urine that is red in colour.</p> <p>Some animals become aggressive.</p> <p>As the disease progresses, the temperature drops to normal and then to below normal until the animal dies.</p> <p>The Dead Animal</p> <p>The blood in the animal is watery. The inside is pale to yellow instead of pink. The liver, gall bladder and spleen are enlarged.</p>	<p>Animals can be vaccinated but getting vaccine and storage is very difficult.</p> <p>To prevent Redwater, try to maintain the animals' immunity by letting a small number of ticks stay on the animals all the time.</p> <p>Dipping about once a month in areas where there are many ticks will help prevent Redwater.</p> <p>Calves born in Redwater areas become immune without severe sickness as long as they carry enough ticks when they are young.</p> <p>If an animal dies of Redwater, apply dip to kill the ticks on its body. The ticks are infected with Redwater and will infect other animals if they bite them.</p>	<p>If an animal gets sick with Redwater, it must be treated or it will die.</p> <p>Humans can eat the meat of an animal that definitely died of Redwater, as long as necessary hygiene measures are taken.</p> <p>Treat by injecting with a medicine like Dizene, Berenil RTU, or Imizole.</p> <p>Berenil RTU:</p> <ul style="list-style-type: none"> • A deep intramuscular injection. • Inject 5ml/100kg livemass. • Do not inject more than 10ml at any one site. • Dizene: 7ml/ 100kg <p>Imizole:</p> <ul style="list-style-type: none"> • to treat Redwater only: 1ml/100kg • to prevent Redwater and treat Gall-sickness: 2.5ml/100kg <div data-bbox="1046 224 1334 719">  <p>Warning!</p> <p>This medicine can kill the animal if too much is given.</p> </div>



Figure 20: Animal with advanced Redwater (Note red urine).

Disease	Symptoms	Prevention	Treatment
<p>Gallsickness – tick borne</p> 	<p>The live animal</p> <p>Symptoms are similar to Redwater except there is no red urine. The animal has a very high temperature (40–44°C) and doesn't want to eat. It is tired, often lying down and breathes very fast.</p> <p>Cows can stop producing milk and become thin.</p> <p>The inside of the mouth, the rims of the eyes and the inside of the vagina are white instead of pink, later becoming very yellow.</p> <p>The animal is very constipated with hard yellow-brown dung.</p> <p>When it is very sick, the animal's temperature drops back to normal and then below normal.</p> <p>The Dead Animal</p> <p>The blood in the animal is watery.</p> <p>The lining of chest and stomach are yellow instead of pink.</p> <p>The flesh is pale. The liver is enlarged and orange.</p> <p>The gall bladder is swollen with dark green bile.</p> <p>The spleen is enlarged and soft.</p>	<p>Young calves are only slightly affected and develop immunity if born in an area where the tick carrying this disease is found. Do not dip young calves. They must get bitten by the ticks to develop immunity, but beware of the udders in the heifers.</p> <p>Animals can be vaccinated but storing this vaccine is very difficult. It is therefore better to allow livestock to have some ticks so that they can develop immunity.</p> <p>Except for the udders of cows and heifers, which can be damaged by ticks, only dip when there are a lot of ticks on the cattle.</p> <p>If an animal dies of Gall-sickness, apply dip to kill the ticks on its body. The ticks are infected with Gall-sickness and will infect other animals if they bite them.</p>	<p>Treat by injecting into the muscle a short acting anti-biotic, like Terramycin 100 or Hi-Tet 120, for three days in a row, or using a long-acting ocytetracycline such as Terramycin LA. Dosage rates will vary depending on the make of the injection that you buy.</p> <p>Hi-Tet 120 dosage:</p> <ul style="list-style-type: none"> • Intramuscular injection • 1ml/10kg livemass • Inject every day for 3 days. • Remember not to inject all the medicine into the same site – rather put a maximum of 25ml into any one site and then find another site. <p>Other treatments</p> <p>Imizole: 2.5ml/100kg, will also treat Gall-sickness.</p> <p>Supportive treatments: Vitamin B complex.</p> <p>Metabolic stimulants such as Phosamine or Metastim will increase chances of successful treatment.</p> <p>Good nursing is necessary. Give the animal shelter from rain and sun and plenty of fresh, clean water to drink.</p>


Disease	Symptoms	Prevention	Treatment
<p>Sweating sickness (Imfudumalo)</p> 	<p>This disease is caused by the toxins produced by bont-legged ticks.</p> <p>The animals become ill and run a high temperature.</p> <p>Sticky moistness of the skin behind the ears, behind the elbows and between the hind legs.</p> <p>Loss of hair and inflammation of the mouth and eyes.</p> <p>January to March is the worst time.</p> <p>The moisture on the animal is not sweat.</p> <p>Young animals (1-9 months old) are most susceptible.</p> <p>The whole skin may be affected. The hair becomes loose and cakes with pus from under the inflamed skin.</p>	<p>If your animal gets this disease, it means you are allowing it to have too many ticks. This disease is caused by lots of Bont-legged ticks biting livestock.</p> <p>Allow some ticks on the livestock but not too many. Dip when there are a lot of ticks on the animals or, about once a month, when it is the time of many ticks, between January and March</p>	<p>Inject into the muscle with a long acting antibiotic such as Terramycin LA or Hi-Tet 200 LA, as well as Metastim and Vit B complex.</p> <p>Metastim dosage:</p> <ul style="list-style-type: none"> • 5 ml <p>Vit B complex dosage:</p> <ul style="list-style-type: none"> • 5ml <p>Vit A or Multivite</p> <ul style="list-style-type: none"> • 2ml <p>Hi-Tet 200 LA dosage:</p> <ul style="list-style-type: none"> • Intramuscular injection. • 1ml/10kg livemass • Repeat injection after 3 days if necessary. <p>Remember to inject not more than 20 ml into one site and the other half in a new site.</p> <p>Keep the animal in the shade and give it fresh, clean water daily. Remove all Bont-legged ticks by hand, not forgetting the tail.</p>



Figure 21: An animal with sweating sickness showing moist area around ears and on the face where hair-loss has occurred^{vi}.

Disease	Symptoms	Prevention	Treatment
<p>Lumpy skin disease</p>  	<p>The animal becomes hot and sweaty.</p> <p>Lumps of between ½ and 5 cm form in the skin over either the whole animal or parts of it.</p> <p>Affected animals usually have painful legs and are lame.</p> <p>The lumps dry out and form scabs, which peel.</p> <p>Lumpy skin lesions on the testicles may cause permanent sterility, while lumps in the udder may cause the loss of one or more quarters. Lumps internally in the lungs cause Pneumonia.</p>	<p>Cattle must be vaccinated every year with Lumpy Skin Disease Vaccine. They should be given 5ml (subcutaneous injection).</p>	<p>Lumpy skin cannot be treated, but secondary infections can be prevented by injecting the animal with penicillin, which must be obtained from a veterinarian, or long-acting Terramycin which can be bought locally.</p> <p>Sick animals should be given shelter and plenty of water and green food containing Vitamin A.</p> <p>Vitamin A injection: 2ml</p>

Figure 22: A calf with lumpy skin disease ^{vii}.

Disease	Symptoms	Prevention	Treatment
<div><div>Warts (Izimsumpa)</div><div></div><div></div><div><i>Figure 23: Warts on the nose of a cow^{viii}.</i></div></div>	<p>Two kinds of warts are usually found. One is a lumpy, solid growth. The other is a growth that looks feathery.</p> <p>They are found on the necks of young cattle as well as teats of cows, especially during their first pregnancy.</p> <p>They often go away by themselves.</p>	<p>Most animals become immune as they get older and then the warts go away by themselves.</p>	<p>Cut a number of warts off so that they bleed in order for some virus to get into the blood stream. This can stimulate an immune response, which will clear them.</p>

Sickness/diseases mainly affecting cattle and goats

Disease	Symptoms	Prevention	Treatment
Heartwater (Umqhaqhazelo emazinyaneni)  	<p>The Live Animal</p> <p>The organisms that cause Heartwater are transmitted by Bont ticks.</p> <p>Heartwater can result in death within 24 hours, but some cases survive 2 to 5 days.</p> <p>Infected animals show nervous symptoms: high stepping jerky gait, shivering, walking in circles.</p> <p>Later, jerky, paddling movements with the legs and the head pulled backwards when the animal goes down.</p> <p>The Dead Animal</p> <p>Excessive fluid in the heart sac, lungs, chest cavity and abdominal cavity.</p>	<p>To prevent Heartwater, try to maintain the animals' immunity by letting a small number of ticks stay on the animals all the time.</p> <p>Dipping about once or twice a month in areas when there are many ticks will also help prevent Heartwater.</p> <p>Calves born in Heartwater areas become immune without severe sickness as long as they are not excessively dipped for ticks while young.</p> <p>If an animal dies of Heartwater, dip it to kill the ticks on its body. The ticks are infected with Heartwater and will infect other animals if they bite them.</p>	<p>Treat the animal early before nervous symptoms show.</p> <p>Use a short-acting oxytetracycline such as Hi-Tet 120 for three days in a row, or new drug Doxycycline. Use an intravenous injection if you can, otherwise intramuscular.</p> <p>Dosage rates will vary depending on the make of the injection that you buy.</p> <p>Doxycycline dosage: 4ml/100 kg</p> <p>Hi-Tet 120 Dosage:</p> <ul style="list-style-type: none"> • Intramuscular injection. • 1ml/10kg livemass • Inject every day for 3 days. <p>Remember not to inject all the medicine into the same site – rather put a maximum of 20ml into any one site and then find another site.</p>

Figure 24: Typical nervous symptom of Heartwater ^{ix}.


Sicknesses/diseases affecting mainly goats and sheep

Disease	Symptoms	Prevention	Treatment
Pulpy Kidney (Enterotoxaemia) 	<p>The live animal</p> <p>This disease is caused by bacteria that often exist within the sheep's intestine but only cause disease symptoms under certain circumstances such as a change of grazing, exhaustion, sudden dietary changes and dosing with dewormers.</p> <p>The bacteria in the intestine produce a toxin (poison) which results in death.</p> <p>Symptoms vary – sometimes the sheep are found dead, at other times, they either (1) appear exhausted, show paralysis and a loss of consciousness and may have laboured breathing, salivation and diarrhoea or (2) have nervous symptoms with convulsions, accompanied by salivation, grinding of teeth and muscle twitches until death.</p> <p>The dead animal</p> <p>The carcass decomposes quickly and there are haemorrhages on the heart and blood under the skin in the neck region. The lungs may contain excessive amounts of blood and the heart sac may contain fluid. The kidneys may appear enlarged, dark red or pale brown and decomposed. They may contain large amounts of blood.</p>	<p>Vaccinate lambs with Enterotoxaemia Vaccine (including a booster injection) and then repeat vaccination annually.</p> <p>Give 1ml per animal as a subcutaneous injection.</p>	<p>Treatment is not possible – rather prevent it through vaccination.</p>

Disease	Symptoms	Prevention	Treatment
<p>Sheep-scab</p> 	<p>This is a highly contagious disease of sheep caused by a small mite (<i>Psoroptes ovis</i>) that lives on the skin. (It causes mange in goats)</p> <p>The live animal</p> <p>The mites feed on the skin causing itching, matted wool, bare patches due to loss of wool and emaciation.</p>	<p>Prevent the movement of infected sheep and goats.</p> <p>Keep treated sheep and goats away from infected sheep and contaminated camps and sheds.</p> <p>Wash and disinfect all vehicles, shearing equipment and clothing of herders/handlers.</p>	<p>Treat all infected animals (and animals that have been in contact with infected animals) with a registered product.</p> <p>Registered products include both dips (e.g. Taktik TR Cattle Dip) and injectable products such as Paramax or Dectomax, which both contain Ivermectin.</p>



Figure 25: Signs of sheep scab.

Disease	Symptoms	Prevention	Treatment
<p>Limping associated with abscesses and foot rot (Ukuxhuga ibenamathumba)</p> 	<p>Swelling in the foot that is hot, red and painful. Sometimes, they burst open and ooze pus.</p>	<p>Do not leave goats standing in water or mud for a long time.</p> <p>Dip the feet to kill ticks.</p> <p>Regularly check your goats' feet for ticks, especially ones that are limping.</p> <p>Clean overnight kraals/facilities monthly.</p>	<p>Open and drain the abscess when it has a yellow spot on it or when it softens.</p> <p>Use a boiled razor blade to cut the abscess. Then syringe/ pour warm boiled water with a lot of salt in it (1 tablespoon of salt in a cup of water) or iodine into the wound.</p> <p>Spray daily with a wound aerosol such as Woundsept Plus or iodine.</p> <p>Keep the wound open to allow it to drain.</p> <p>Bury or burn the material used to wipe the pus. This can infect other animals and people.</p> <p>Always boil the razor blade before using it.</p> <p>Treat with a long-acting oxytetracycline such as Terramycin (1ml/10kg) in bad cases.</p>




Disease	Symptoms	Prevention	Treatment
Tapeworm cysts in the brain 	Animals show signs of brain damage, for example, walking in circles.	Break the life cycle of the tapeworm. Do not feed dogs the brains or heads of sheep or goats. Deworm your dogs at least every six months. Treat the whole flock with an appropriate product if signs of infection are seen.	No treatment is possible once the animal shows symptoms, so keep your sheep, goats and especially dogs worm-free.
Mange  	Mange results in loss of hair and skin irritation.	Prevent the disease by dipping with a suitable dip if there are signs of mange in the area.	Inject infected animals with a product such as Dectomax or dip with a suitable dip such as Dazzel or Triatix (at a dosage rate of 2 teaspoons per 5 litres water).

Figure 26: Signs of mange^x.

Disease	Symptoms	Prevention	Treatment
<div><div><div>Orf</div><div></div></div><div></div><div><div>Figure 27: Signs of orf^{xi}.</div></div></div>	<p>Wart-like sores on the animal's lips and nose and around the mouth of especially young lambs and kids and on the teats of their mothers.</p>	<p>Vaccination of all lambs and kids when the females have stopped lambing for the season.</p> <p>Method of vaccination: Take a thick (18g) needle insert it into the vaccine. Then pierce the skin in the armpit of the animal.</p>	<p>Spray the affected areas with an iodine spray daily. Hard scabs can be softened with Vaseline or glycerine to make it easier for the animals to eat.</p> <div><div><div>Warning!</div><div>Use gloves as the disease can spread to the hands of humans.</div></div></div>

Disease	Symptoms	Prevention	Treatment
<p>Bluetongue</p>  	<p>Difficult rapid breathing as a result of Pneumonia, resulting in a general bluish colour of the mucous membranes of the eye and the mouth and. eventually of the tongue</p> <p>Sore joints, especially the feet and back. So bad that the animal can sometimes walk on its knees and tends to lie down a lot.</p> <p>Animal stops eating and the stomach stops moving.</p> <p>Animal becomes sensitive to sun and the ears become warm and pink.</p>	<p>Vaccinate especially sheep for Bluetongue every year in the spring as the disease is transmitted by midges – insects.</p> <p>Move sheep and goats to higher areas where there are fewer insects.</p>	<p>Treat the pneumonia with antibiotics – a long-acting Terramycin every 3 days until recovery.</p> <p>Dosage: Adult sheep/goats 5ml every 3 days injected into the muscle.</p> <p>Treat the pain with aspirin (2 tablets twice a day) or Phenylbutazone injection 5ml per day into the muscle.</p> <p>Treat the stomach with Metastim or Phosamine Stimulans 5ml per day and treat the sensitivity to the sun by putting the animal into the shade.</p>

Figure 28: Signs of Blue tongue ^{xii}.

Sickness/diseases affecting pigs






Disease	Symptoms	Prevention	Treatment
Mange 	Animals' coats look rough and dull and become itchy.	Treat affected pigs immediately and separate sick pigs from healthy pigs.	Treat with suitable product, either injectable (e.g. Ivomec at 1 ml per 33 kg live weight, under the skin), oral or pour-on dip).
Erysipelas (Diamond skin disease)  	Symptoms include large, dark red, diamond-shaped lesions on the skin. The pig will also have a fever.	Vaccinate pigs with Farrowsure Plus B (5ml dose) or Suvaxyn PLE+B (5ml dose) – this is a multi-component vaccine that covers three key diseases. <i>Young pigs:</i> vaccinate at 6 months of age and repeat 1 month later. <i>Adult boars:</i> Vaccinate every 6 months with a single dose <i>Adult sows:</i> Revaccinate with a single dose 1-3 weeks after farrowing Keep pens clean and separate sick animals from healthy ones.	Treat with antibiotics (penicillin).



Figure 29: Characteristic skin lesions. ^{xiii}

Disease	Symptoms	Prevention	Treatment
Leptospirosis 	<p>Symptoms include: High fever, lack of appetite, anaemia, abortions, mummified piglets, infertility and stillborn piglets.</p>	<p>Vaccinate pigs with Farrowsure Plus B (5 ml dose) or Suvaxyn PLE+B (5 ml dose) – this is a multi-component vaccine that covers three key diseases.</p> <p><i>Young pigs:</i> vaccinate at 6 months of age and repeat 1 month later.</p> <p><i>Adult boars:</i> Vaccinate every 6 months with a single dose.</p> <p><i>Adult sows:</i> Revaccinate with a single dose 1-3 weeks after farrowing.</p>	<p>Treat with antibiotics.</p>
Porcine parvovirus 	<p>The infected sow will not conceive (become pregnant) and thus will continue to cycle and show signs of heat.</p>	<p>Vaccinate pigs with Farrowsure Plus B (5 ml dose) or Suvaxyn PLE+B (5 ml dose) – this is a multi-component vaccine that covers three key diseases.</p> <p><i>Young pigs:</i> vaccinate at 6 months of age and repeat 1 month later.</p> <p><i>Adult boars:</i> Vaccinate every 6 months with a single dose.</p> <p><i>Adult sows:</i> Revaccinate with a single dose 1-3 weeks after farrowing.</p>	<p>No treatment is available.</p>

Disease	Symptoms	Prevention	Treatment
<p>Newcastle Disease (Uvolomisa)</p>  	<p>This is the only disease that makes chickens walk backwards.</p> <p>The birds gasp when they breathe and they breathe with an open beak.</p> <p>Sticky mucous comes from the mouth and there may be yellowish diarrhoea.</p> <p>Later the bird becomes paralysed and is unable to stand up.</p> <p>Most of the birds that contract the disease will die.</p>	<p>Vaccinate with La Sota or ND Clone 30.</p> <p>Directions for dosing:</p> <ul style="list-style-type: none"> • Boil 20 litres of clean water and allow it to cool completely • Dissolve the vaccine tablet in: <ul style="list-style-type: none"> – 5 litres for under 50 birds – 10 litres for 50-100 birds – 20 litres for over 100 birds • Allow the birds access to the medicated water for an hour or two, directly after mixing. • Confine the birds the night before without water so that they are thirsty and all drink the medicated water. 	<p>There is no treatment for Newcastle Disease, but sick birds can get other diseases that can be treated. Some birds with Newcastle Disease will recover. To help them, treat with an antibiotic such as Terramycin Powder or Cosumix Plus or Coliprim.</p> <p>Terramycin Powder dosage:</p> <ul style="list-style-type: none"> • Mix 4 level teaspoons in 7 litres of water. • Give to the chickens for 6 days in drinking water after restricting water for a few hours in the morning. <p>Cosumix Plus dosage:</p> <ul style="list-style-type: none"> • For adult chickens mix 1.5g in 1.5 litres of water (1 heaped teaspoon in 5 litres of water). • Give to the chickens for 3 to 6 days in drinking water after restricting water for a few hours in the morning. <p>Coliprim:</p> <ul style="list-style-type: none"> • 1 teaspoon in 2 litres of water, • Give it to chickens for 3 to 6 days in drinking water after restricting water for a few hours in the morning.







Figure 30: Signs of Newcastle Disease ^{xiv}.

Disease	Symptoms	Prevention	Treatment
<div><div><div>Fowl pox (Upokisi)</div><div></div></div><div></div><div>Figure 31: Chicken with Fowl Pox ^{xv}.</div></div>	<p>Sores occur on the wattles, comb and skin of the face. They start as a pale spot and become yellowish and swollen before drying out to a scab.</p> <p>Raw, yellowish sores can also occur in the mouth and windpipe. This is serious and can lead to suffocation and death.</p>	<p>Prevent the disease by vaccinating with Fowl Pox Vaccine.</p> <p>Use a syringe to mix the fluid and the freeze dried vaccine. Then dip a 14/15 gauge needle into the vaccine and shallowly pierce the skin on the outside of the chicken's thigh (to a depth of 3mm).</p> <p>It is recommended that birds be vaccinated between 3 and 12 weeks of age but older birds can also be vaccinated. Vaccination should result in life-long immunity.</p> <p>Isolate sick birds to prevent spread of disease.</p> <p>Do not vaccinate during or shortly after an outbreak of the disease.</p>	<p>There is no treatment for fowl pox but the farmer can use an iodine spray on the sores to prevent further secondary infections.</p>

Disease	Symptoms	Prevention	Treatment
Gumboro 	<p>Gumboro results in immune suppression and the chicken will show signs of secondary infections.</p>	<p>Vaccinate against Gumboro.</p>	<p>Treat the secondary infections with products such as Coliprim or Cosumix Plus.</p>
Diarrhoea in fowls 	<p>Fowl cholera: Birds are hot and shiver. They drink a lot of water. Slimy mucous comes from the mouth. They have watery diarrhoea with specks of blood in it. Most cases live 1-4 days.</p> <p>Chronic cases show symptoms of a cold and develop swellings of the joints of the wings and/or legs and the wattles.</p> <p>Lameness and drooping of a wing may result.</p> <p>Coccidiosis: Infection of the gut results in bloody diarrhoea. The birds are also drowsy and not interested in eating.</p>	<p>Isolate sick birds to prevent spread of disease to healthy birds.</p>	<p>Treat with Cosumix Plus or Coliprim.</p> <p>Cosumix Plus dosage:</p> <ul style="list-style-type: none"> For adult chickens mix 1.5 g in 1.5 litres of water (1 heaped teaspoon in 5 litres of water). Give to the chickens for 3 to 6 days in drinking water after restricting water for a few hours in the morning. <p>Coliprim dosage:</p> <ul style="list-style-type: none"> 1 teaspoon in 2 litres water Give it to the chickens for 3 to 6 days in drinking water after restricting water for a few hours in the morning.

Disease	Symptoms	Prevention	Treatment
<p>Bumble foot (Izilonda ngaphansi kwezinyawo (amabatha))</p>   <p><i>Figure 32: Bumblefoot^{xvi}.</i></p>	<p>The birds become lame in one leg and the pad is found to be swollen and painful.</p> <p>A brownish corn is usually found over the centre of the swelling.</p> <p>Pus may come from the side of the corn.</p>	<p>General cleanliness is important. Infected chickens should be kept separate and after cleaning their feet, you should dispose of the material in such a way that the environment is not contaminated with germs (for example by burning).</p>	<p>The corn should be removed and the swelling should be disinfected with iodine or methylated spirits.</p> <p>Pus should be removed from the lesion – make an incision if necessary. Clean the cavity with iodine.</p> <p>Cover the wound with a dressing and confine the bird in a cage on straw. Change the dressing every 3–4 days. Inject ½ml of long-acting oxytetracycline such as Terramycin LA into the chicken's upper leg muscle.</p>





Disease	Symptoms	Prevention	Treatment
<p>Mites (Okhupe)</p>   <p><i>Figure 33: Chicken's leg affected by scaly leg mites ^{xvii}.</i></p>	<p>There are two types of mites, one that lives on the chicken's legs and the other that lives on the chicken's body.</p> <p>Scaly leg mites burrow underneath the scales on the feet and legs causing roughness and lameness.</p> <p>Red mites are very small and appear blue or red after feeding on chickens' blood.</p> <p>They infest poultry houses, hiding in cracks.</p>	<p>Clean chicken house regularly and spray with Karbaspray.</p>	<p>Rub Benzyl benzoate over the legs. This can be bought from chemists where it is known as Ascabiol, the treatment for scabies in children.</p> <p>Dust the birds with Karbadust and spray the house carefully with Karbaspray.</p> <p>The birds can be treated by placing them in a feed bag with their heads out of the top. Pour the Karbadust into the bag and then dust the bird.</p> <div data-bbox="812 215 1015 607">  <p>Do not spray karbaspray on birds.</p> </div>




Disease	Symptoms	Prevention	Treatment
<p>Tampans (Fowl ticks)</p>   <p><i>Figure 34: Picture of a poultry tick ^{xviii}.</i></p>	<p>The bird become pale and is often paralysed.</p> <p>Tampans are parasites related to ticks. They are greyish-blue and hide in the chicken house. They only feed at night.</p>	<p>Clean chicken house regularly and spray with Karbaspray.</p>	<p>Treat birds with Karbadust and spray the house carefully with Karbaspray whenever there is an outbreak.</p> <div data-bbox="448 219 644 607">  <p>Do not spray karbaspray on birds.</p> </div> <p>The birds can be treated by placing them in a feed bag with their heads out of the top. Pour the Karbadust into the bag and then dust the bird.</p>
<p>Biting lice</p>   <p><i>Figure 35: Picture of lice that affect poultry ^{xix}.</i></p>	<p>Ruffled feathers that fall out from all over the body.</p>	<p>Clean chicken house regularly and spray with Karbaspray.</p>	<p>Treat birds with Karbadust and spray the house carefully with Karbaspray whenever there is an outbreak.</p> <p>The birds can be treated by placing them in a feed bag with their heads out of the top. Pour the Karbadust into the bag and then dust the bird.</p> <div data-bbox="1262 219 1458 607">  <p>Do not spray karbaspray on birds.</p> </div>

Sickness/diseases affecting horses

Disease	Symptoms	Prevention	Treatment
<div><div>African Horse Sickness</div><div></div><div></div></div>	<p>This is a viral disease transmitted by midges (small biting insects). The disease is common in late summer and autumn.</p> <p>There are different forms of the disease, which may include fever, haemorrhages in the mucous membranes, swelling under the skin of the head (especially above the eyes) and fluid in the lungs (causing a frothy discharge from the nose and difficulty breathing).</p> <p>It often results in the death of the horse.</p>	<p>Vaccinate every year with African Horse Sickness vaccine.</p> <p>The vaccine is sold as two separate injections (AHS I and AHS II) that must be given 3 weeks apart as subcutaneous injections.</p> <p>Horses should be vaccinated in early summer (October–November). But make sure to vaccinate every year even if outside of recommended months.</p> <p>The vaccine must be stored in a fridge.</p>	<p>Treatment is difficult and costly and the horse will often not recover. The disease does not respond to antibiotics.</p>

Figure 36: Horse with African Horse Sickness showing swellings above the eyes. ^{xx}.

Disease	Symptoms	Prevention	Treatment
<p>Rabies</p>   <p><i>Figure 37: Dog with rabies^{xxi}.</i></p>	<p>Animal behaviour changes – dogs become either aggressive or shy</p> <p>Other symptoms include:</p> <ul style="list-style-type: none"> • Being unable to eat or swallow • Salivation • Jaw hanging • Loss of balance and paralysis • Death within 5-7 days. 	<p>Vaccination is the only prevention.</p> <p>Puppies should be vaccinated at 3-6 months of age then boosted 1-9 months later.</p> <p>All dogs should then be vaccinated annually.</p>	<p>There is NO treatment – this is a fatal disease.</p> <div data-bbox="443 215 783 607">  <p>This disease affects other animals as well as people – it is a disease controlled by the state.</p> </div>
<p>Distemper</p> 	<p>Affected dogs display the following symptoms:</p> <ul style="list-style-type: none"> • Mucous from the nose and eyes • Diarrhoea • Muscle twitching • Weakness and death. <p>Young dogs show more of a fever and stop eating.</p>	<p>Vaccination is the only prevention.</p> <p>Vaccinate at 2-3 months of age and repeat 1 month later.</p>	<p>There is NO treatment as this is a viral disease, however secondary infection may be managed with antibiotics.</p> <p>Note: Once the brain is affected, there is no effective treatment.</p>

Disease	Symptoms	Prevention	Treatment
Biliary 	<p>This affects dogs of all ages. The disease is sudden and severe.</p> <p>Symptoms include:</p> <ul style="list-style-type: none"> • Loss of appetite • High temperature • Pale gums • Weakness • Death. 	<p>There is no vaccine available for this disease which is transmitted by ticks.</p> <p>The disease can be prevented by keeping the dog free of ticks.</p>	<p>Consult your local Veterinarian urgently for advice on treatment of the condition as this is a rapid disease.</p> <p>The medicine for treatment can only be injected and is fatal if overdosed.</p>
Parvo Virus 	<p>Unvaccinated young dogs are most susceptible.</p> <p>Symptoms include:</p> <ul style="list-style-type: none"> • Fever • Lack of appetite • Severe vomiting • Smelly diarrhoea – eventually with blood • Dehydration • Weakness • Death. 	<p>Vaccination is the very best prevention.</p> <p>Vaccinate at 2-3 months of age, and repeat after one month.</p>	<p>The affected dog can be given fluids with electrolytes by drip or by mouth.</p> <p>Home rehydration mixture:</p> <ul style="list-style-type: none"> • 1 teaspoon of salt and 8 teaspoons of sugar in 1 litre of water. Give 10-20ml every hour into the mouth. • The dog will also need to be nursed carefully and kept warm and comfortable. Newspapers should be changed regularly because of the diarrhoea.
Mange 	<p>See section under diseases affecting goats and sheep.</p>		

5 Vaccination Programmes for Livestock

Management programme for cattle

This is a management programme for a herd that does not have a controlled breeding season.

Month	Vaccination
January	
February	<ul style="list-style-type: none"> Deworm calves for tapeworms and roundworms
March	<ul style="list-style-type: none"> 15 March: Vaccinate female calves that were born between the previous July and December for contagious abortion (CA) – The vaccine Brucella S19 can only be given to female animals that are 4 to 8 months of age Castrate male calves that you are not keeping for breeding (use a Burdizzo)
April	<ul style="list-style-type: none"> Vaccinate all animals for Quarter Evil and Anthrax (Blanthrax vaccine) Vaccinate calves again for quarter evil 3 weeks later Deworm calves for tapeworms and roundworms Deworm all animals except calves for liverfluke Deworm thin cows for roundworms Start feeding winter licks
May	
June	
July	
August	<ul style="list-style-type: none"> Vaccinate all animals for lumpy skin disease Recommend: Vibriosis and Leptospira combination vaccination to all cows, heifers and bulls
September	<ul style="list-style-type: none"> 15 September: Vaccinate female calves born in the period January to June for CA (The vaccine Brucella S19 can only be given to female animals that are 4 to 8 months of age) Castrate male calves that you are not keeping for breeding (use a Burdizzo) Deworm all animals except calves for liverfluke Deworm thin cows for roundworms
October	<ul style="list-style-type: none"> Start feeding summer lick
November	
December	

(Developed by Joanne Mann, DAEARD)

Note: Depending on the area and the diseases that are prevalent, additional vaccinations can be carried out – consult your local vet.

Key vaccinations for other livestock types

This section covers key vaccinations for goats, sheep, chickens, pigs, dogs and horses

Goats and sheep	
Essential for sheep: Bluetongue (recommended for goats)	<ul style="list-style-type: none"> Vaccinate all sheep and goats every year in September (give the 3 injections 3 weeks apart)
Recommended: Pasteurella, Pulpy kidney, Clostridium, Tetanus	<ul style="list-style-type: none"> Vaccinate kids/lambs at 4 months of age with a multi-component vaccine (e.g. Multivax P) and repeat 1 month later Vaccinate adult sheep/goats every year in September and repeat 1 month later
Household chickens and layers	
Essential: Newcastle Disease	<ul style="list-style-type: none"> Vaccinate all chickens every 3 months with any La Sota vaccine
Recommended: Gumboro Disease	<ul style="list-style-type: none"> Vaccinate all chickens every 3 months when vaccinating for Newcastle Disease
Broiler chickens	
Essential: Newcastle Disease	<ul style="list-style-type: none"> Buy vaccinated chicks or vaccinate on arrival with Nobilis ND Clone 30 vaccine; repeat on Day 18
Recommended: Gumboro Disease	<ul style="list-style-type: none"> Vaccinate all chicks when 1 week old with Nobilis Gumboro D78 vaccine
Pigs	
Essential for relatively large herds: Erysipelas, Parvovirus, Leptospirosis	<ul style="list-style-type: none"> Vaccinate with multi-component vaccine (e.g. 5 ml dose of Farrowsure Plus B or Suvaxyn PLE+B)
Horses	
Essential: African Horse Sickness (AHS)	<ul style="list-style-type: none"> Every year, vaccinate all horses Give the first vaccine (AHS I) in late October and repeat with the second vaccine (AHS II) 3 to 4 weeks later
Recommended: Tetanus	<ul style="list-style-type: none"> Vaccinate all horses – repeat every five years
Dogs	
Essential: Rabies	<ul style="list-style-type: none"> Vaccinate puppies at 3-6 months of age and repeat 1-9 months later Vaccinate all dogs annually (every year)
Recommended: Parvovirus	<ul style="list-style-type: none"> Vaccinate puppies at 2 months of age and repeat 1 month later
Recommended: Distemper	<ul style="list-style-type: none"> Vaccinate puppies at 2 months and repeat 1 month later
Recommended: Deworming	<ul style="list-style-type: none"> Treat puppies with deworming tablets every 2-3 months Treat adults every 6 months.

6 Dosage Guideline Table

This table has been developed to show approximate weights that can be used when deciding how much medicine to give to a particular animal.

With cattle, the farmer must decide whether the animal he/she is treating is the size of a new born calf, a bigger calf, a young cow, a fully grown cow or a big ox (the same process must be followed if a goat is being treated). Then the farmer can use the weight given in the table below to assess how heavy his or her animal is and how much medicine it needs.

However, it is much better if the farmer can measure its weight more accurately, using a scale or a weight band.

		Hi-tet 120	Hi-tet 200 LA	Dizene	Veriben / Berenil	Sulfazine 16%	Terramycin soluble powder
Type of animal	Weights (kg)	1 ml per 15kg ml	1 ml per 10kg ml	7ml per 100kg ml	5ml per 100kg ml	14ml/10kg ml	1 tsp per 7kg teaspoons
New born goat kid	3	0.5	0.5			4	0.5
Half grown goat	20	1.5	2.0			28	3
Full grown female goat	40	2.7	4.0			56	
Full grown male goat	60	4.0	6.0			84	
New born calf (imvemve)	45	3.0	4.5			63	6
Calf 2-6 months	100	7	10	7	5	140	14
Calf 6-12 months	200	13	20	14	10		
Small cow	350	23	35	25	18		
Full grown cow	500	33	50	35	25		
Big ox	650	43	65	46	33		

7 Glossary

Abort	This is when a female animal expels (loses) her foetus before reaching the end of her pregnancy.
Abscess	A swelling that contains pus.
Active ingredient	This is the key ingredient in a medicine / stock remedy that makes it effective.
Afterbirth	This is the material that passes out of the mother after the birth of an animal. It comprises the placenta, the membranes that surrounded the foetus and the umbilical cord.
Anaemia	This is when there is a breakdown of the red blood cells in the blood resulting in thinning of the blood. Pale mucous membranes and pale gums are a sign of anaemia.
Antibiotic	A medicine used to treat infections / diseases caused by micro-organisms such as bacteria.
Antibodies	These are the proteins in the blood that are produced by the immune system. They attach to harmful organisms and prevent them making the animal sick.
Bacteria	These are small organisms (micro-organisms) that can cause disease and sickness. They are too small for you to see without a microscope.
Bone marrow	This is the soft material in the middle of bones. It is responsible for making white blood cells that are an important part of the immune system.
Broad-spectrum	This is a medicine that kills a wide variety / range of organisms or parasites.
Cc (vs ml)	This is the unit used to measure medicines. A cc is a cubic centimetre. One cc is the same as 1 millilitre (ml).
Cell	This is the basic unit of all living things. Plants and animals are made up of millions of cells.

Colostrum	This is the first milk that is produced by a mother after giving birth. It is highly nutritious and also contains antibodies that the young animal can absorb.
Conceive	This is when an animal becomes pregnant.
Contaminate	This is when something becomes dirty or impure.
Cull	To remove an inferior (low quality) or infertile animal from the herd. It can be sold or slaughtered.
Defaecate	The process where the animal expels waste from its digestive system.
Deworm	To treat an animal with medicine that kills worms inside the animal.
Diarrhoea	This is when an animal has a digestive upset and the faeces are very liquid.
Disease	This is a sickness or illness that can be caused by parasites, micro-organisms or nutritional deficiencies.
Dose	This is the process of giving medicine to an animal via its mouth. The word 'dose' can also refer to the amount of the medicine that must be given to the animal.
Drug	This is a medicine given to an animal to treat a sickness or disease
Electrolytes	These are salts given in water to animals to replace body fluids lost through bad diarrhoea or heavy sweating.
Faeces	This is waste material from the digestive system of an animal that passes out of the anus. It is known otherwise as dung or excrement.
Fever	This is when an animal has a raised body temperature due to a bacterial infection. The raised temperature is the body's way of destroying the disease-causing organisms.
Germ	These are small organisms (micro-organisms) that cause sickness and disease.
Haemorrhages	This is where the blood vessels rupture (burst) releasing the blood they contain.

Heifer	A young female animal before it calves (gives birth) for the first time.
Hygiene	This is a state of cleanliness and the practices that support a clean and healthy environment
Immune system	This is the animal's defence system that allows it to fight the organisms that cause disease and sickness. It can consist of natural immunity or it can be strengthened through vaccination.
Immune suppression	This is where the animal's immune system is weakened. This often occurs when the animal is stressed by poor nutrition.
Indigenous	This describes plants and animals that originated in the area where they now occur rather than being brought in from elsewhere.
Intramuscular injection	This is an injection where the needle is pushed into the muscle.
Intravenous injection	This is an injection where the needle is inserted into the vein.
Lesion	An injury, wound or sore on an animal.
Lick	A feed supplement that is given to animals to provide specific minerals, energy or proteins that are deficient in the animal's diet.
Lifecycle	This is the process whereby an organism or animal is born or hatches, matures and reproduces.
Mange	A condition where the animal is suffering from a skin infection that causes itchiness and hairloss.
Mastitis	Inflammation of the mammary tissue (udder) of an animal, often due to bacterial infection.
Mineral	Certain substances, such as calcium and phosphorus, found in animal feed and soil that are important components of bones and necessary for cellular processes.
Mites	Very small organisms that are found on the skin surface and which can cause mange. They can only be seen with a microscope.
Mucous membranes	These are the smooth, moist linings of the mouth, intestine and vagina.

Nasal discharge	This is the liquid material that runs out of the animal's nostrils/nose. It can be due to a viral infection of the lungs, or an allergy or it can be due to nasal bots.
Ox (oxen)	Castrated male cattle
Parasites	Small organisms that live on and feed off animals. They are found either within the body of the animal (e.g. worms in the intestine) or on the skin of the animal (e.g. ticks).
Quarter	The portion of a cow's udder associated with one teat.
Rectum	The lower part of the intestine from which digestive waste is excreted when an animal defaecates.
Ruminating	This is when ruminants such as cattle, sheep and goats regurgitate food that they have already swallowed and chew it further (they are otherwise said to be 'chewing the cud').
Rump	The area, at the top of an animal's hindquarters, to which the tail is attached.
Scours	A bad case of diarrhoea that often shows signs of blood in the faeces.
Sterilize	The process of treating items in such a way that any germs are killed – this often involves boiling them for a period of time.
Stock management	The process of managing your livestock, which involves taking decisions about breeding and feeding them and keeping them healthy.
Subcutaneous injection	An injection where the needle is pushed between the skin and the underlying muscle.
Supplementation	The process where animals are given feed or licks that makes up for deficiencies in their diet.
Symptoms	Signs of sickness and disease that can be seen in the live animal or the dead animal.
Temperature	This is a measure of how hot the animal's body is. Animals have a normal range of temperatures, but this can increase or decrease if they are sick.

Thermometer	This is the tool used to measure an animal's body temperature.
Urinate	This is the process where animals expel liquid waste from their bodies.
Urine	This is the liquid waste that is produced by the kidneys and expelled from the body during urination.
Vaccination	This is the process where an animal is given a vaccine to protect it against a particular disease. Vaccination is often done by injection (inoculation) but some vaccinations for chickens involve use of droplets deposited into the eye or sprayed above the chickens.
Vaccine	A vaccine is a type of medicine that protects animals against certain diseases. Vaccines either contain weak or dead forms of the organism that causes the disease. The animals develop antibodies in response to the vaccine which then protect them if they encounter the disease organisms.
Venereal disease	This is a disease that is passed between animals during mating.
Vet	A veterinarian – someone who is qualified to diagnose and treat sick animals.
Vitamin	A substance found in different foods that is important for the health of animals and people.
Vulva	The opening that leads into the birth canal of a female animal.
Wattles	The soft unfeathered parts that hang underneath a chicken's beak.
Weight band	A band that is placed around the girth of an animal and which allows you to estimate its weight.
Worms	Internal parasites found within the animal's digestive system (e.g. intestine) or other body organs such as the liver.

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