Animal Health

Photograph by Arnoldt //Gaseb

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NNFU

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Rangeland Management
Small Stock Management
Large Stock Management
Crop Production
Mechanics
Labour Management
Farming Finances

TABLE OF CONTENTS

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This manual is part of a broader manual on livestock production which was developed by NASSP (National Agricultural Support Services Programme). We would like to thank the Ministry of Agriculture, Water and Forestry and the European Union for granting us the permission to use it.

Joint Presidency Committee
Windhoek, 2009

Preface

It is with great pleasure, gratitude and pride that the JPC presents this production manual.

After years of deliberation, careful planning, and a lot of dedication the NAMIBIA AGRICULTURAL UNION and the NAMIBIA NATIONAL FARMERS' UNION jointly embarked on the EMERGING COMMERCIAL FARMERS' SUPPORT PROGRAMME. This programme resulted from the realisation that the new group of emerging commercial farmers who, having been previously disadvantaged and mostly coming from the background of communal farming, were in dire need of basic (sophisticated) skills training to manage modern farming techniques. The planning phase entailed, amongst others, a need assessment way back in 2004/5, which clearly identified the areas of assistance required. After having analysed all the relevant data, the two unions set about structuring a two-year programme which would address the challenges faced by new farmers so that ultimately they would be able to deal with the daunting task of becoming successful commercial farmers. Besides a dedicated programme of lectures, training courses, study tours and mentoring, it was decided to also produce and publish a set of eight PRODUCTION MANUALS which would serve as valuable training guides with technical details, but would also be a source of reference for future everyday practical farming in Namibia.

It is with gratitude that we acknowledge the unrelenting support of many individuals, too numerous to name, and certain institutions which supported and still support the whole Emerging Commercial Farmers' Support Programme.

We sincerely hope that this initiative will make a lasting contribution to sustainable agricultural land utilisation and to the goals of land reform in Namibia.

On behalf of the JPC,

Ryno van der Merwe
(President, Namibia Agricultural Union)

Pintile Davids
(President, Namibia National Farmers' Union)

Windhoek, 2009

Foreword

Agriculture, as the backbone of Namibia's economy, has a major role to play in achieving Vision 2030. However, to be able to make a significant contribution towards the growth of the economy and thus wealth creation, agricultural production/output has to increase manifold. For the realisation of such an increase the following crucial issues have to be addressed. Subsistence farming should become commercialised, e.g. landownership in some form or other should be allocated to individuals, underutilised areas should be developed and put into production and the problem of bush encroachment should be addressed and solved at national level.

Food production at competitive and affordable prices for the consumer is the biggest challenge that farmers worldwide have to face. With input costs increasing at a higher rate than the increase in prices realised for produce from the farm, it is clear that productivity and the production capacity on farms have to improve continuously. This also applies to Namibia's agricultural sector.

Furthermore, if we want to participate in international trade with our export commodities, currently being beef, mutton, Karakul pelts and grapes, we have to be able to compete worldwide against all the countries exporting the same commodities. Apart from being price competitive we also have to be competitive in satisfying the needs of the sophisticated consumer in terms of quality, health issues, traceability, animal welfare and other ethical production norms, e.g. personnel management, conservation of biodiversity/ecology (fauna, flora and water resources), etc.

Agricultural production is no longer just a matter of producing whatever the farmer is able and willing to produce and then expecting to achieve good prices for the product.

Farmers have to become more involved in the value chain, and should become much more market orientated by being sensitive to the needs and preferences of the consumer whom they want to serve. In addition they have to adhere to international trading rules and regulations as prescribed by the World Trade Organisation (WTO), and also comply with the Sanitary and Phytosanitary (SPS) requirements of the various countries with which they want to trade. Norway, for instance, has zero tolerance for salmonella in beef/mutton, which is imported into that country, thus making it very difficult to serve this lucrative market.

*It is obvious that survival and growth in the agricultural sector can only be achieved if the farmer in future **pays greater attention** to the world around him, as has been the case in the past.*

Skills development and training of farmers and their employees are becoming imperative, and are of national interest.

Being a farmer and thus the owner of agricultural land in Namibia should be regarded as a privilege. Not every citizen in Namibia, as in countries all over the world, can own agricultural land. There is just not enough land available. Therefore every farmer has a responsibility to use his piece of land in a productive but also a sustainable way. Productive means exploiting the full production potential of the farm, furthermore contributing towards job creation in the primary and secondary sector, towards food production on national and international level and towards revenue for Government in terms of taxes paid. Sustainable means preserving and even improving the production potential, so that the generations to come can still make a living from that land. It should be the aim of every landowner to leave behind a farm that is in a better condition than the one he started off with, including production capacity, infrastructure and natural resources, e.g. underground water, fauna (game) and flora (plants).

Commercial farmers in general are often perceived as being wealthy, which, however, is not the case. Becoming a successful farmer in Namibia may take years and even generations, and requires love for and dedication towards farming, hard work, good management skills, financial discipline, persistency and a positive attitude.

Climate (rainfall) and other external unforeseen events can have a major influence on the progress made on the farm, and can ruin achievements made over years within a matter of time.

To get an indication of the current gross/net income on a cattle farm, the following indicators could serve as a guideline.

The average stocking rate on cattle farms in Namibia is ± 25 kg biomass (live mass) per ha. In old terms this meant ± 14 ha for every animal on the farm. In a cow/ox production system the production of beef (live mass) should be about 35 % of the stocking rate.

This means that if no herd building takes place, the farmer has 25 kg x 35 % = 8,75 kg live mass/ha available for sale every year.

At an average selling price (cows, oxen, heifers combined) of N$9.00/kg live mass he/she would be able to generate a gross income of N$9.00 x 8,75 kg = N$78.75/ha (± N$80.00).

The operational costs will be at least around 50 % of the gross income, which leaves a net income of N$80.00 x 50 % = N$40.00/ha.

On a 5 000 ha cattle farm the gross income will thus be ± N$400 000 and the net income, if operational expenditure is well managed, ± N$200 000. This amount is available for interest and capital repayments (Agribank), new improvements/replacements on the farm and private expenditures.

These indicators clearly show that a 5 000 ha cattle farm will not enable a farmer to become wealthy overnight. To the contrary, for those farmers to survive they often either create additional income with employment elsewhere, or they venture into diversification on the farm e.g. guest farms, hunting, crops, hay, olive and charcoal production, etc.

It is advisable not to diversify as long as the main production line is not well managed and exploited to its full potential.

Although the commercial farmer functions in isolation on his property and to a great extent depends on himself concerning the day-to-day activities and progress on the farm, it is still important to establish and maintain good relationships with the neighbours. The control of stock theft and illegal hunting, predator control and the maintenance of border fences, etc. require good and open communication with, and trust in the neighbours.

In conclusion, farming should be a constant process of learning. Even farmers with formal agricultural qualifications still have to keep in touch with the latest developments concerning farming practices, market requirements, consumer preferences, etc. It is advisable to make use of every opportunity to improve their own knowledge and skills, to enable themselves to adjust and therefore survive and prosper in an ever-changing world. Farmers' days, study groups and established successful farmers can be a good source of knowledge and new ideas and are often a stimulation to creative thinking.

INTRODUCTION

A livestock revolution is taking place in the world. The demand for livestock products is sharply increasing, also in the developing world. Many of the poorest people in the world are dependent on agriculture in general and livestock in particular for their livelihoods. It is generally accepted that increasing the productivity of livestock farming can serve for many people as a viable pathway out of poverty. Its inherent aridity and highly variable resource base makes Namibia mostly suitable for extensive livestock production.

Namibia has a highly developed commercial livestock sector with significant competence to produce high-quality livestock products for local and international markets. The communal livestock sector, on the other hand, is less developed and mainly focuses on subsistence-oriented livestock farming. A third sector, the emerging commercial farming sector, is currently evolving with most of the farmers having to make the transition from communal subsistence livestock keeping to commercial oriented market-based livestock production. The Government of Namibia wants to see 15 million hectares of currently white-owned land being transferred to previously disadvantaged Namibians by 2020. This will increase the number of emerging farmers at least threefold from current numbers.

It is for this sector that the Emerging Commercial Farmers' Support Programme (ECFSP) specifically caters to increase their competence (knowledge, skills and attitudes) to sustainably increase livestock production and subsequent incomes. It is mainly for these emerging commercial farmers that this manual on animal health has been developed, although it will be equally useful to communal and established commercial farmers.

Livestock production can be improved through various means that include improved breeding and selection practices, improved nutrition of the livestock herd and prevention and cure of animal diseases. In most of these practices, a long period of time is needed before progress can be shown, while the prevention of diseases can have a direct short-term impact on mortality rates of livestock and the subsequent income derived from healthy animals. This manual tries to provide the farmers with what is needed to make an immediate impact on the health status of his/her livestock.

This first section of the animal health manual discusses basic terms used when talking about animal health management, such as what is meant by vaccination of animals, what is meant when referring to antibiotic treatments, how to administer an injection, how to give medicine by mouth and, lastly, how to control parasites.

The second section of the manual discusses the need for animal disease control, and for addressing methods and means for spreading of infectious diseases amongst livestock. The manual then focuses on methods of disease control at farm level as well as on what government does to control livestock diseases in the country.

The third section of the manual addresses the treating of wounds and injuries amongst livestock as well as what to do when animals are poisoned.

The last section of the manual provides an extensive guideline on how to recognise important diseases and what further action is recommended to treat them.

The overall aim of this manual is to provide guidance to recognise diseases that can be treated by the farmer, and provide some reference on how to do treat minor ailments and when to call in professional advice and help.

Some livestock diseases can have devastating consequences for the entire livestock industry. The emerging commercial farmers are an integral part of the Namibian livestock production sector and therefore also have to assume a part of the responsibility for the long-term success of the industry, which is largely based on the overall animal health status of the country.

CHAPTER 1
Animal Health Management

There are many types of diseases that affect animals. They are usually classified by the cause of the disease.

Infectious diseases

Infectious diseases are caused by microbes that get into the body and cause disease. These can be viruses, bacteria or protozoa. They are very tiny organisms that invade the body and cause damage.

The body responds to this infection of microbes and tries to fight off these invaders. If the body manages to fight off these microbes it recovers from the disease. The body develops a memory of what these microbes look like so that it can act against them if they try to invade it again. This memory of the body is called immunity.

If the body cannot fight off the infection the animal usually dies.

Parasitic diseases

These diseases are caused by parasites like worms and ticks. A parasite is an organism that lives on an animal (external parasites) or in an animal (internal parasites) and feeds off that animal.

Poisoning

Poisoning of an animal occurs if the animal is exposed to a poisonous substance. This could be either by eating the poison like a poisonous plant or drinking water that is contaminated with poison. Poisoning can also occur if too much of a medicine or remedy is injected or applied to the animal or if too much of a substance that is normally not poisonous is taken in.

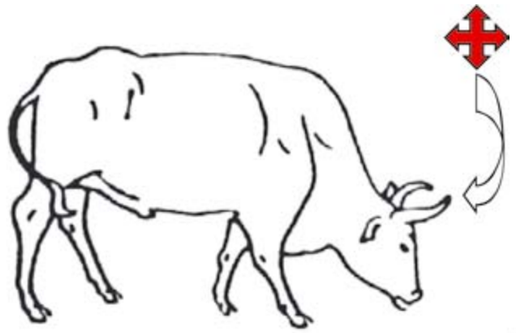
Deficiency diseases

These diseases are caused by the animal not getting in enough important nutrients like minerals and vitamins.

1. Vaccination

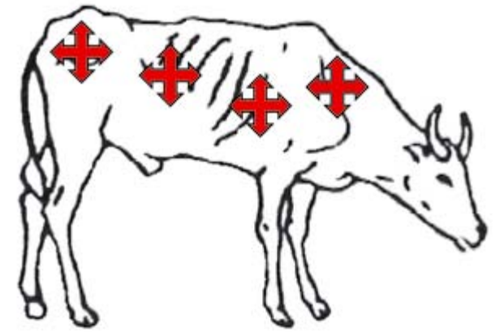
For some infectious diseases scientists can make a weakened or dead form of the disease-causing microbe in the laboratory, which can be injected into the body to develop the immunity – memory – to these microbes. This is called a **vaccine**.

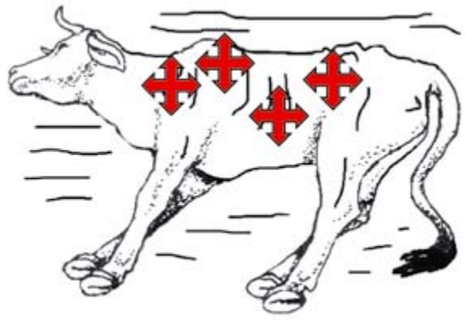
If the animal has been vaccinated against a disease and the memory is developed, the animal will not get sick if the real disease-causing microbes try to invade the body.

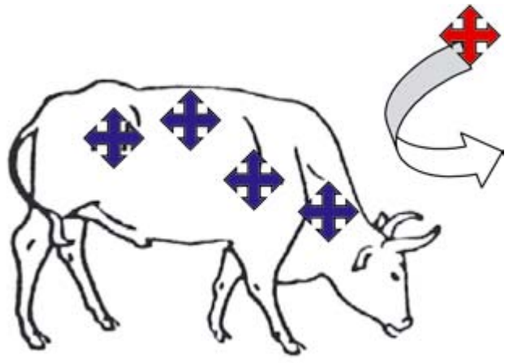


The animal comes into contact with the disease-causing microbes.

The disease-causing microbes invade the body and make the animal sick.





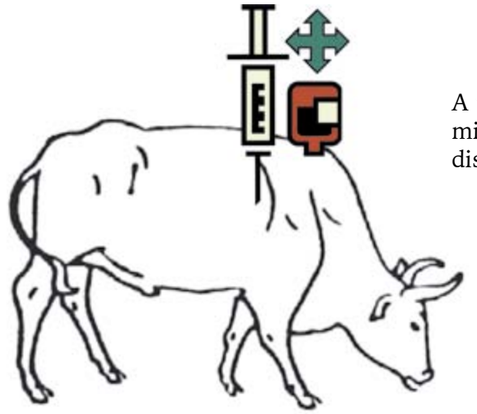


The animal can die of the disease …

… or the animal can get better with or without treatment.

The animal develops a memory of the disease-causing microbes, which helps to fight them off if they try to invade again.

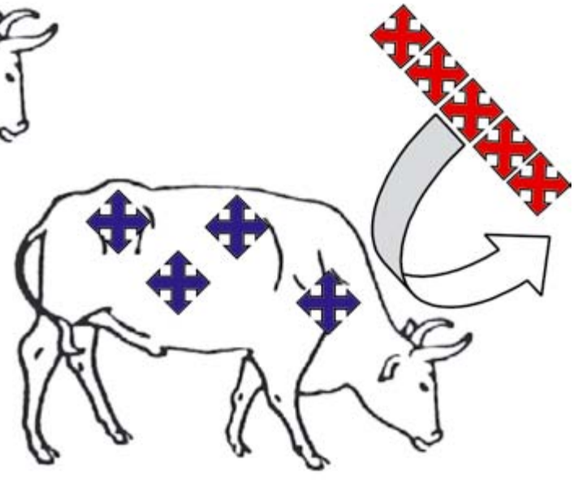
If an animal is vaccinated against the disease one tries to develop the memory of the body on how to fight the disease.



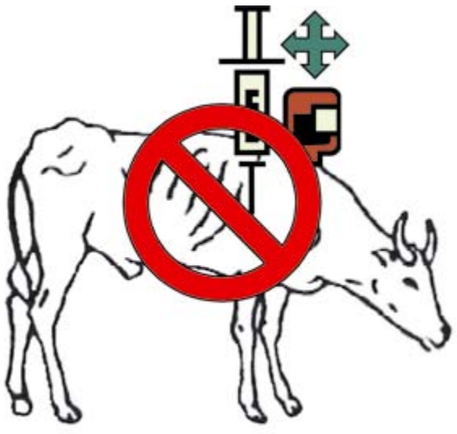
A weakened or dead form of the disease-causing microbe is injected into the animal to develop the disease memory called **immunity**.

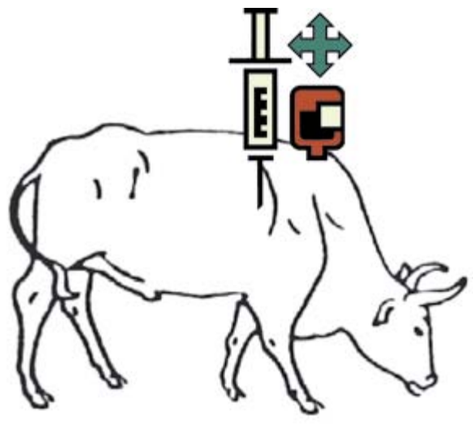
If the real disease-causing microbes try to invade the body of the animal, the memory of the animal helps it to fight off the invasion.

The animal is immune to the disease.

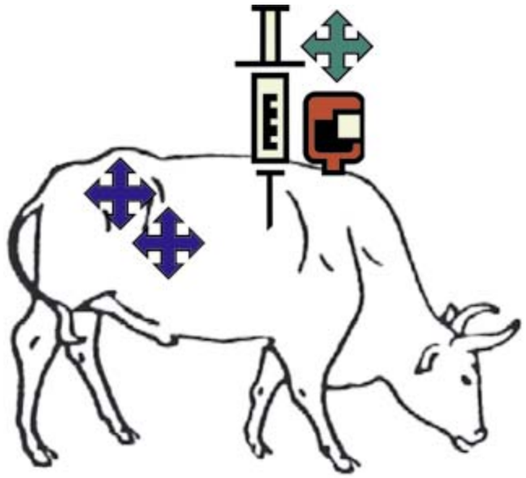


It is important to vaccinate only healthy animals. Weak and sick animals cannot develop a memory and may even get sick from the vaccine.



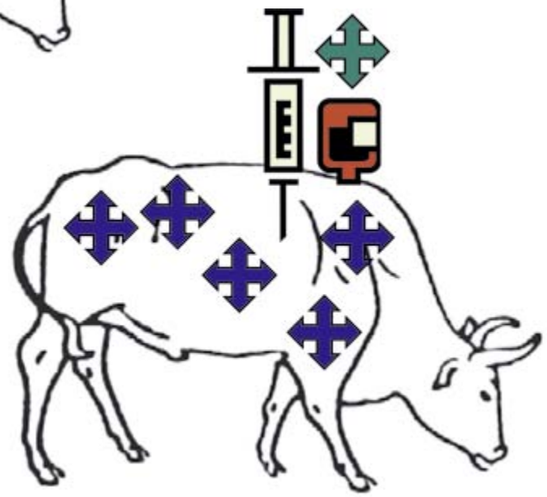


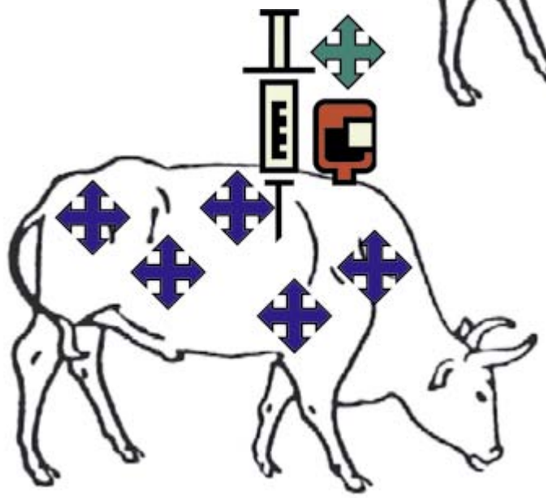
For effective vaccination and for the developing of immunity the animal needs to be vaccinated repeatedly.



For most diseases against which the animal is vaccinated for the first time, the immunity will not become very strong.

If the vaccination is repeated after one month, the immunity will become very strong.





If the vaccination is repeated after one year, the immunity will remain very strong.

The vaccination is then repeated every year.

It is very important that vaccines are kept cold in a refrigerator. They may not be frozen.

If the vaccines get warm they will no longer work or can even cause other problems and make the animal sick.

1.1 Vaccination schedule for cattle

1.1.1 Government-controlled vaccinations

The Directorate of Veterinary Services controls the risk of the spread of diseases that are of major economic importance by vaccination campaigns in high-risk areas and in the case of outbreaks of the following diseases:

- Foot-and-Mouth Disease
- Contagious Bovine Pleuro Pleumonia

The vaccination is undertaken by the Directorate of Veterinary Services and no individual, livestock owner or veterinarian, is allowed access to such vaccines.

1.1.2 Compulsory vaccination

The Directorate of Veterinary Services has the authority to enforce the vaccination of livestock against devastating diseases to be able to effectively control these diseases. It is the livestock owners' responsibility to prove that these vaccinations were indeed administered.

- Brucellosis – Brucellosis is an infection that can cause large-scale abortion storms in unvaccinated herds. The disease is also transmitted to humans by contact with aborted foetuses and foetal membranes as well as by drinking the milk of infected cows.
  All heifers under the age of nine months must be vaccinated against brucellosis (contagious abortion). This vaccination must not be repeated.
- Anthrax – Anthrax is a serious disease that causes acute death in animals and can also affect humans.
  All livestock has to be vaccinated annually against anthrax.

1.1.3 Essential vaccinations

- Botulism – Botulism is a paralysis syndrome caused by the toxins produced by bacteria in decomposing organic material. Animals usually get the disease by chewing on bones if they do not have access to a mineral lick. Once afflicted by the disease there is no cure.
  The primary vaccination should be repeated after 4–6 weeks and thereafter annually.
- Quarter Evil (Blackleg) – Quarter Evil is a fatal disease of young livestock, caused by bacteria thought to invade the body through the wounds in the mouth caused by changing teeth. It is usually so rapidly fatal that effective cure is seldom achieved.
  The primary vaccination should be repeated after 4–6 weeks and thereafter annually until the age of three years.

1.1.4 Optional vaccinations

Ask the veterinarian in your area about diseases prevalent in the area and recommendation regarding vaccination.

Sometimes seasonal changes in climatic conditions cause an increase in the incidence of certain diseases.

Some farming systems increase the risk of certain diseases.

Your veterinarian would be best able to advise you on additional vaccinations.

These may include:

- Rabies
- Lumpy Skin Disease
- Pasteurellosis
- Calf paratyphus

Guidelines for the immunisation of cattle

Age	Essential Vaccine	Optional vaccine
7–14 days	–	Live Paratyphoid Pasteurellosis (First)
3–8 weeks	–	Pasteurellosis (Second)
5–6 months	Brucellosis for heifers Botulism (First) Quarter Evil (First)	Lumpy Skin Disease
6–7 months	Anthrax Botulism (Second) Quarter Evil (Second)	Rabies
Annually	Anthrax Botulism Quarter Evil[1]	Lumpy Skin Disease[2] Rabies[3]

[1]Quarter Evil vaccination at least until three years of age
[2]Two different vaccines available:
One claims to provide livelong protection after a single vaccination, another vaccine is recommended to be repeated annually.
[3]The available rabies vaccines are claimed to provide protection against rabies for three years after vaccination, however, it requires very accurate records to know which animals in the herd are due for vaccination if the animals are vaccinated only every third year.

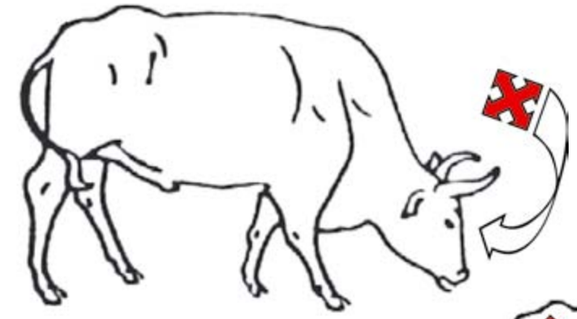
1.2 Vaccination schedule for small stock

Guidelines for the vaccination of small stock

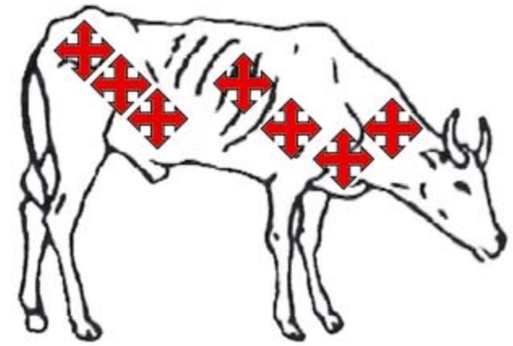
Age	Essential Vaccine	Optional vaccine
From 2 weeks	Pasteurellosis	
4–5 months	Pulpy Kidney (First) Tetanus (First)	Botulism (First) Quarter Evil (First)
6 months	Pulpy Kidney (Second) Tetanus (Second)	Anthrax Botulism (Second) Quarter Evil (Second) Enzootic Abortion (Ewes)
Annually	Pulpy Kidney Pasteurellosis	Anthrax Botulism Quarter Evil Enzootic Abortion (Ewes) – 4 weeks before breeding Tetanus Bluetongue – 9 weeks before breeding

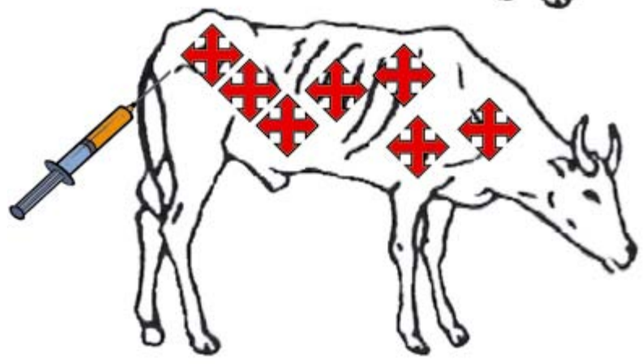
2. Antibiotic treatment

For some infectious diseases drugs like antibiotics help to cure the animal. These drugs have to be used with caution.



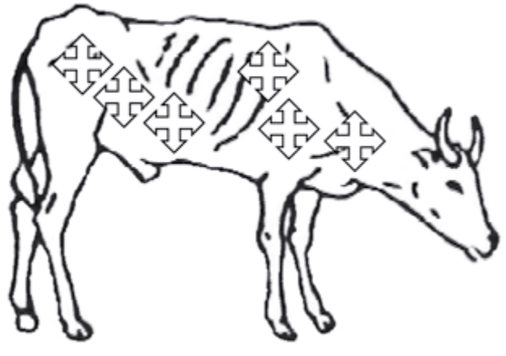
The body is invaded by microbes that make the animal very sick.





If an antibiotic is injected, it acts like a poison on the microbes and makes them weak or kills them.

The weakened or dead microbes can do no more harm to the body. The animal fights the infection with the help of the antibiotic and recovers from the disease.

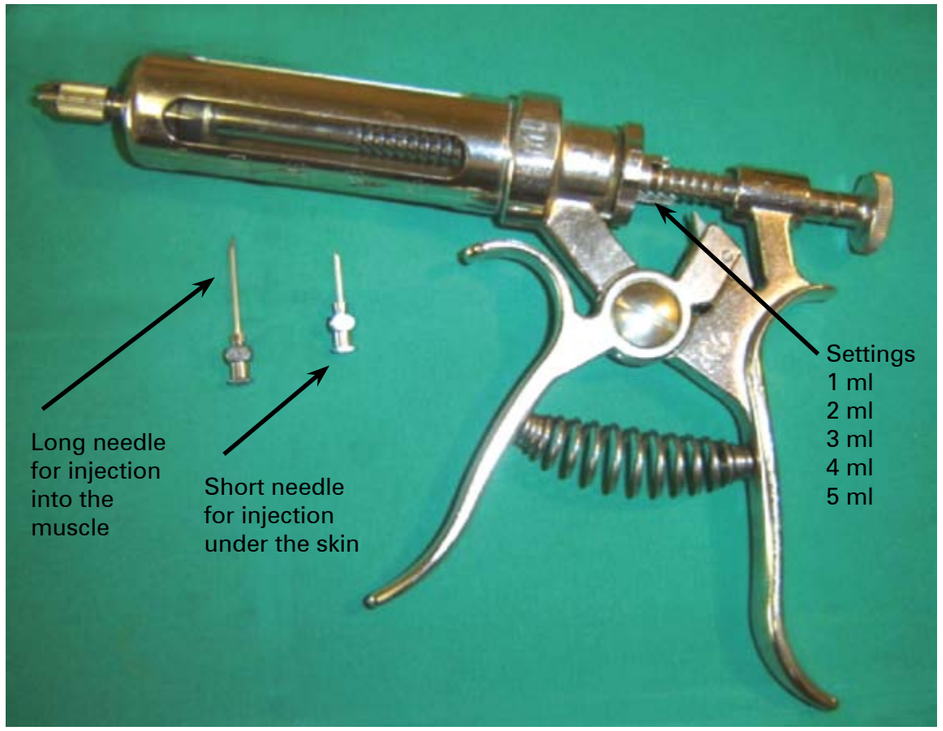


3. Giving injections

It is very useful if the farmer knows how to properly fill a syringe and give an animal an injection.

There are different types of syringes.

3.1 Pistol syringe



These syringes are very useful if many animals have to be injected, for instance with vaccination.

Make sure that the setting is correct for the amount of vaccine that must be injected.

If many animals are injected, change needles regularly (every 5–10 animals) and put the used needle into boiling water to sterilise it before re-use.

How to fill a pistol syringe:

Always use a clean needle to draw up the vaccine or medicine.

Inject the same amount of air into the bottle as the amount of medicine you want to draw up.

Draw the plunger back until the correct volume of drug is in the syringe.

Point the syringe upwards and gently displace the accumulated air and a few drops of vaccine or drug by squeezing the pistol lever or pushing in the plunger.

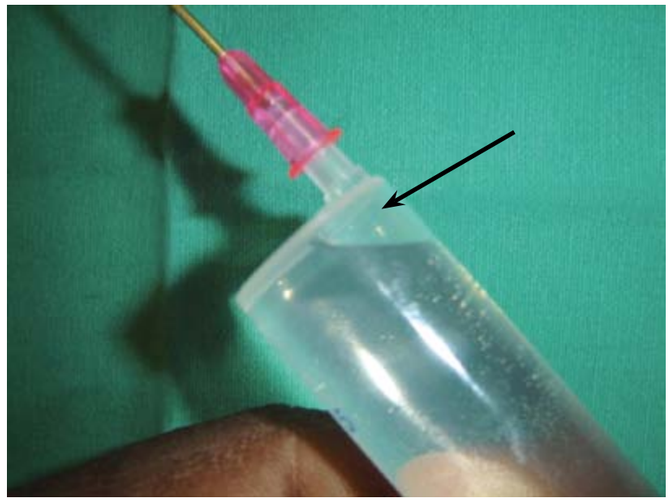
With no air in the syringe and the setting checked and adjusted if necessary, the syringe is now ready for use.

3.2 Disposable plastic syringes

Inject the same amount of air into the bottle as the amount of medicine you want to draw up.

Draw the plunger back until the correct volume of drug is in the syringe.

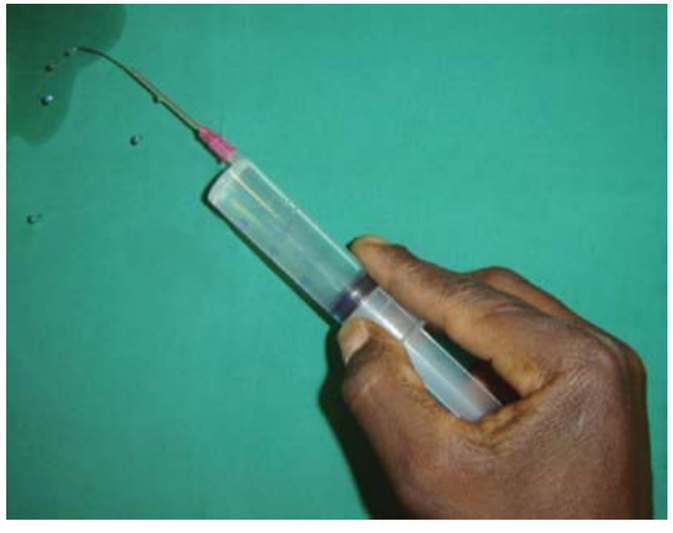
Gently tap on the syringe to loosen air bubbles and make them rise to the top.



Turn the syringe so that the hub is at the top and the air bubble directly under the hub.

Gently squirt out the air and a few drops of medicine.

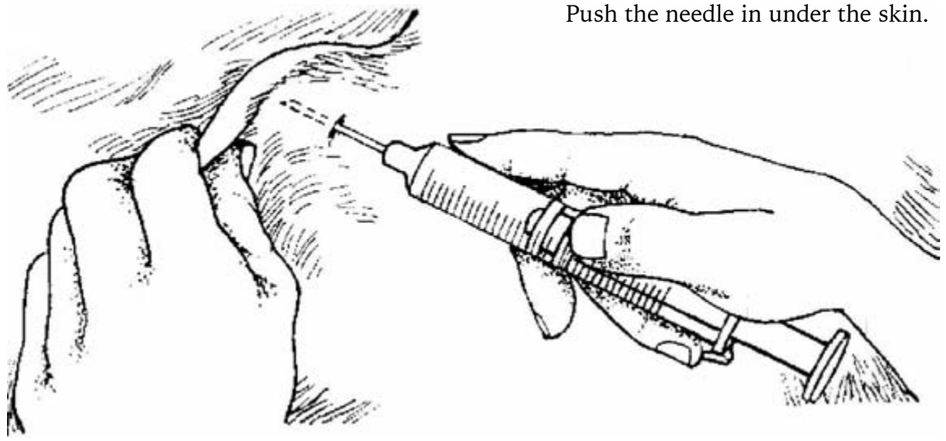
The syringe filled with the medicine is now ready for use.



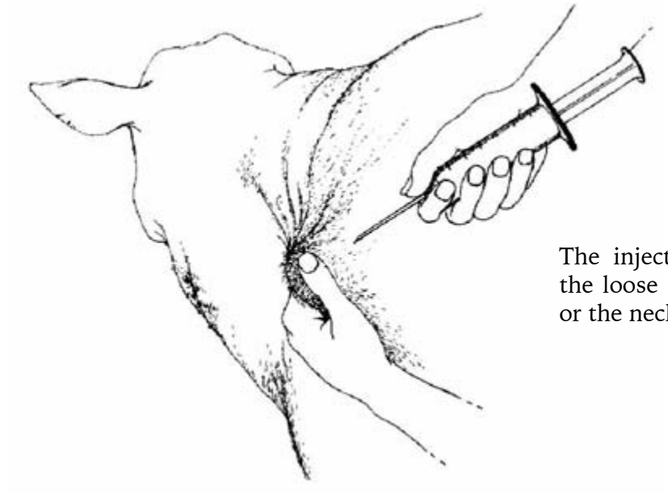
3.3 Injections under the skin

Most vaccinations are given under the skin.

Pick up a skin fold and hold it firmly.



Push the needle in under the skin.

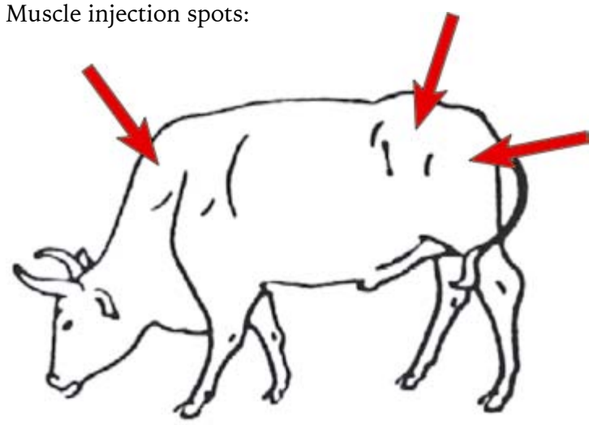


The injection can be given under the loose skin behind the shoulder or the neck.

3.4 Injections into the muscle

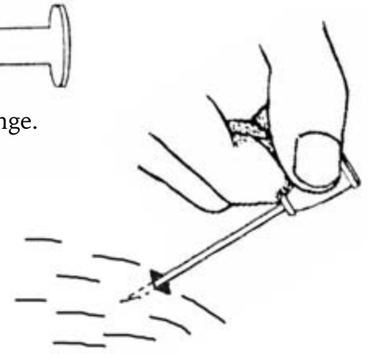
Most antibiotics have to be given by injection into the muscle.

Muscle injection spots:



The animal has to be well restrained to give an injection into the muscle.

Take the needle off the syringe.



Push the needle through the skin into the muscle.

Drugs that have to be injected into the muscle may not be injected directly into the bloodstream. To ensure that the needle is not in a blood vessel, it is important to place the full syringe onto the needle and pull back on the plunger. If blood enters into the syringe, it means that the needle is in a blood vessel and injection in that site would be dangerous. Pull the needle out and repeat the procedure at another injection site. If no blood comes into the syringe, the medicine can be safely injected at that site.

Take note: Many drugs administered by injection into the muscle are irritant and hurt when injected. The injection of the total dose of required drug should be divided into injections of small volumes and injected into different injection sites according to manufacturer recommendations.

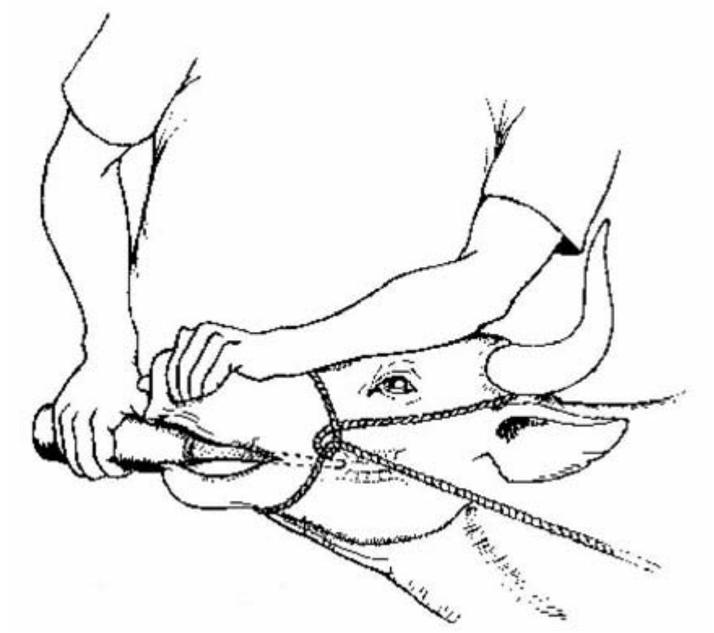
4. Giving medicine by mouth

Some medicines are given by mouth.

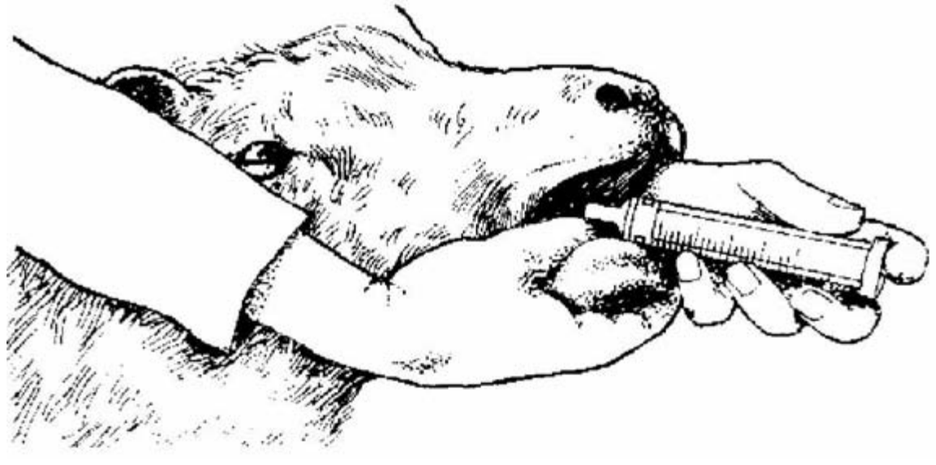
It is very important to let the animal swallow the medicine slowly.

An animal cannot swallow if you hold its tongue.

Give the medicine slowly, otherwise it will go into the windpipe and lungs.



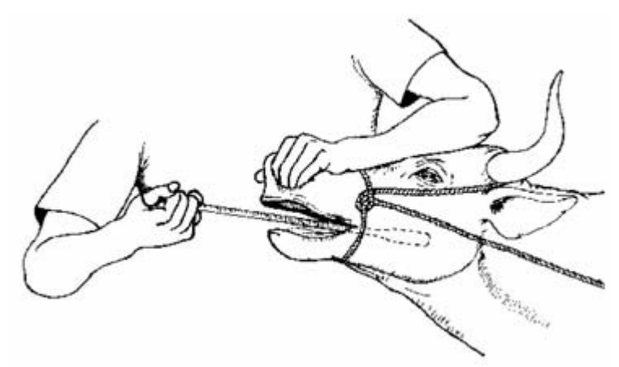
A bottle with rubber or plastic tubing attached to it can be used for dosing.



A disposable syringe can be used to give medicine to an animal.

Special dosing guns or syringes are available but they are quite expensive.

To administer medicine in the form of boluses (large pills) or paste, a special balling gun is often used.



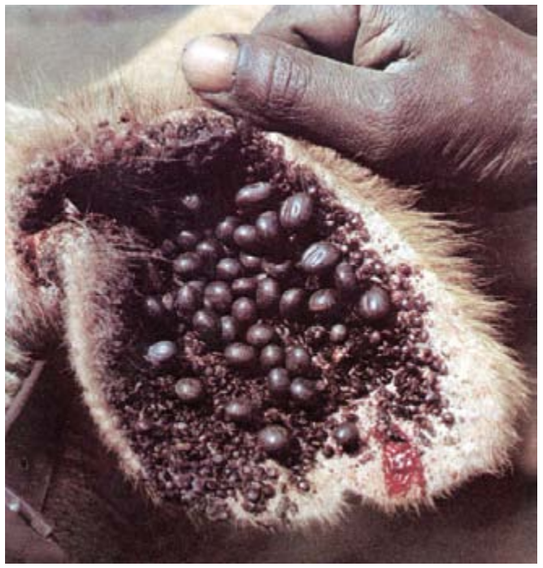
5. Parasite control

Animals are often plagued with parasites. These may be external parasites like ticks sitting on the outside of the animal on the skin or internal parasites like worms inside the animal, usually in the intestines.

These parasites draw blood from the animal or compete with the animal for nutrients in the intestines. If animals have a very heavy parasite burden they can get quite sick from it and even die.

5.1 External parasites

In Namibia the main external parasites on livestock are ticks.



Different kinds of ticks prefer different places on the body where they sit and suck blood.

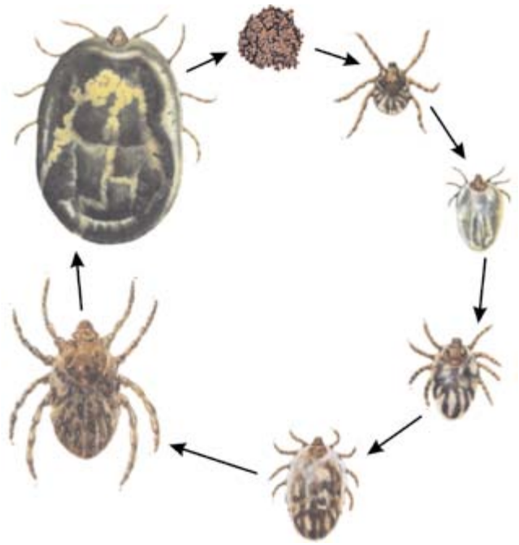
Apart from transmitting diseases they can, for instance, cause serious damage to the ears and udders of animals.

The photographs here show serious infestations under the tail, on the udder and in the ear.

(© All photographs on this page Cooper, McDougall & Robertson Ltd.)

A tick has a life cycle where not all the stages of development take place on the same animal and therefore they cannot be effectively killed with tick control.

The adult female tick sucks blood and then climbs off the animal to lay eggs.



The eggs hatch and the immature stages develop.

The immature stages also suck blood but not necessarily of the same animal.

The mature ticks usually stay on the same animal until they have gorged themselves with blood.

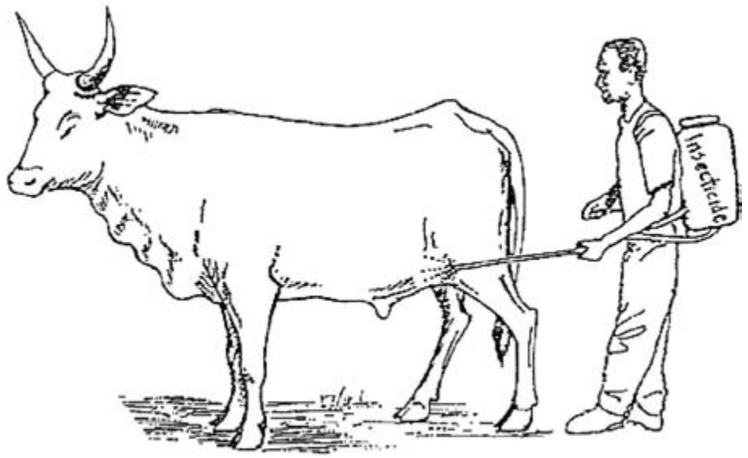
(Illustration adapted from Bayer Pharmaceuticals)

If the tick burden becomes too severe the animals should be treated against these parasites.

One can use different remedies to control ticks.

It is important to follow the directions of the manufacturer accurately.

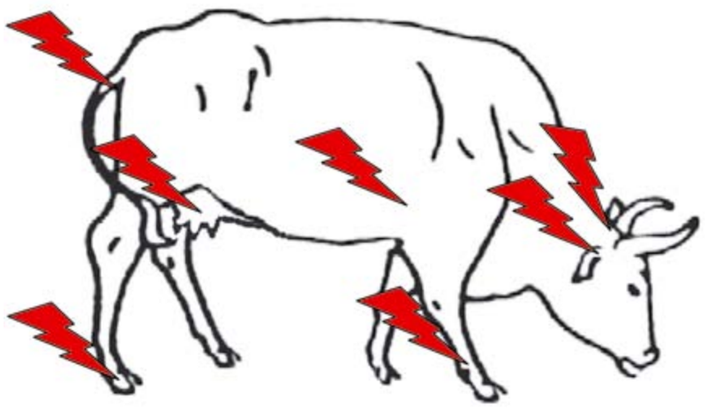
Hand spraying against ticks is a very effective way of tick control.



Different spraying pumps are available, from cheap pumps to very expensive ones.

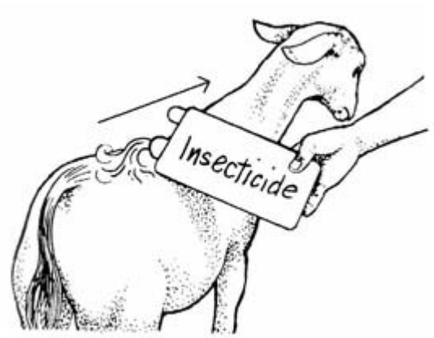
If a pump and a bucket are used, do not use the same bucket for feed or milking.

Tick grease is also very often used to control ticks. This is applied on the skin in the areas where ticks usually feed on the animal.



Tick grease is applied at the base of the horns, inside the ears, in the axilla, at the dewclaws, around the udder, under the tail and between the hind legs.

Pour-on remedies are also available that can be poured on the back of the animal in measured doses and which spread throughout the skin to kill the ticks.



5.2 Internal parasites

Internal parasites are mainly worms living in the intestine of the animal. They draw blood from the animal and compete with the animal for nutrients in the intestine.

Some worms live in the lungs of the animal, while others – the liver flukes – live in the liver.

With a moderate infestation the animal may lose condition gradually.

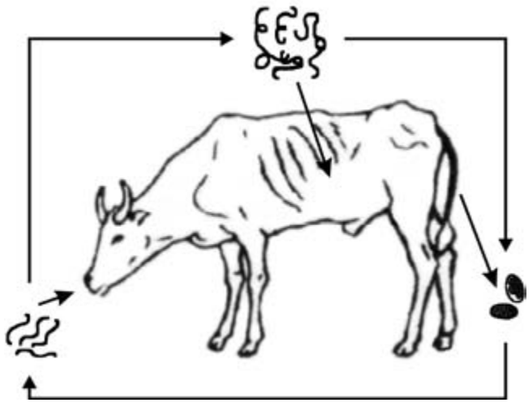
With severe infestations the animals may develop diarrhoea or even die of severe loss of blood.

Some worms can be seen in the dung while other worms are so small that they cannot be seen with the naked eye.

There are different types of worms.

These different types of worms have different life cycles.

- **Roundworms**



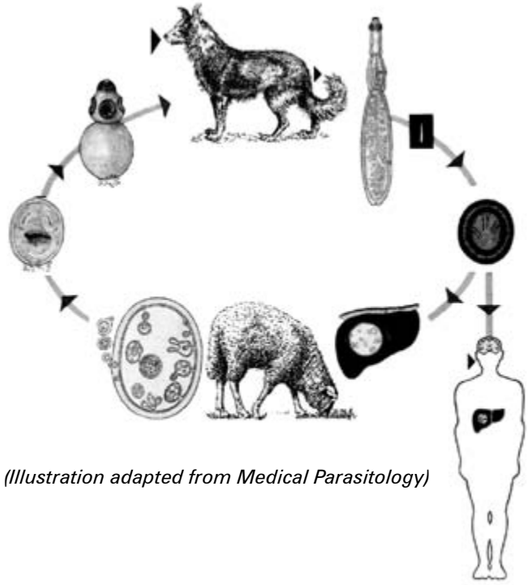
(Illustration adapted from Bayer Pharmaceuticals)

The adult worms live inside the intestine and lay eggs.

The eggs come out with the faeces and hatch in moist and warm conditions.

The immature worms that have hatched from the eggs are taken in with grazing and grow to adult worms in the intestine.

• **Tapeworms**



(Illustration adapted from Medical Parasitology)

There are many types of tapeworms. Some tapeworms occur in humans. They contaminate the grazing with eggs when people do not use a toilet – like measles, where cysts develop in cattle.

Other tapeworms are parasites of animals like dogs and the cysts develop in humans.

• **Flukes**

Adult flukes live in animals. Their eggs pass to the rangeland via the animals' faeces.

The eggs hatch in warm and moist conditions. These immature flukes then infest small snails where they develop further. They then leave the snails and contaminate the pasture. Animals take up these immature flukes while grazing and they finally grow to adult flukes inside the animal again.

Many worm remedies are available, but different remedies have to be used for different types of worms. It is important to follow the instructions of the manufacturer carefully when using these drugs.

It is also very important to combine parasite control with preventing contamination of the pastures and preventing opportunities for the eggs to hatch and thus for the immature worms to develop outside the animals.

CHAPTER 2
Animal Disease Control

Animal diseases are a danger to the livelihoods derived from livestock and therefore need to be controlled.

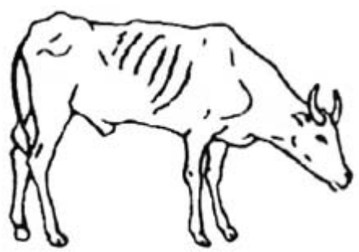
1. The need for animal disease control

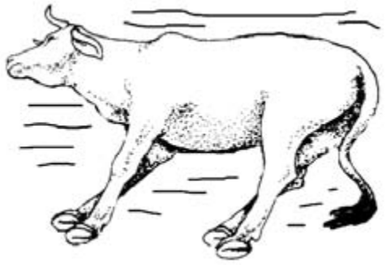
The hazards of livestock disease to people dependent on them are the losses incurred by the owner, which can include the following:

1.1 Death of the animal

An animal that died cannot be used because eating the meat may be dangerous.

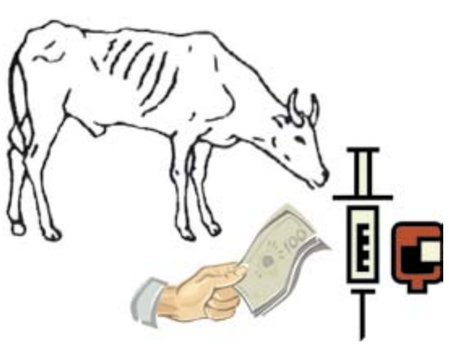
SUCH AN ANIMAL'S MEAT MAY NOT BE SOLD!

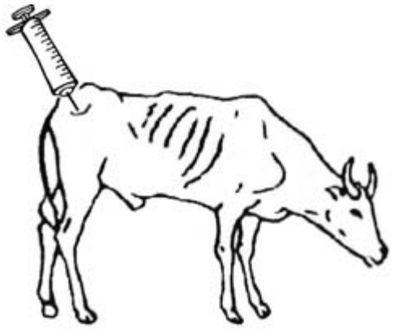




1.2 Cost of treating sick animals

The farmer has to buy expensive medicines to treat the animal or the farmer has to get someone, like the CAHA (Community Animal Health Agent) or Veterinary Services to treat the animal.

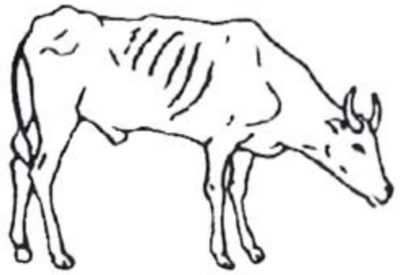




1.3 Loss of production

A sick animal will get thin and will not grow and become fat.

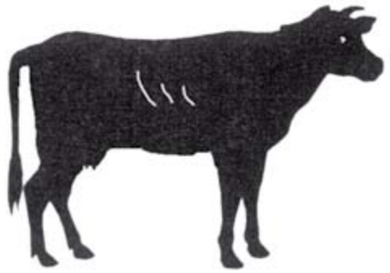
There is less weight of meat on the animal when it is sold.



A sick cow will not get pregnant.

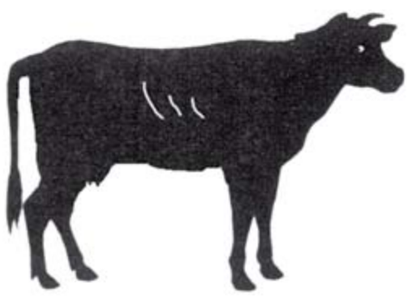
If she was pregnant before, she may abort.

A sick cow cannot raise a calf well.



A sick cow will give less milk or no milk at all.

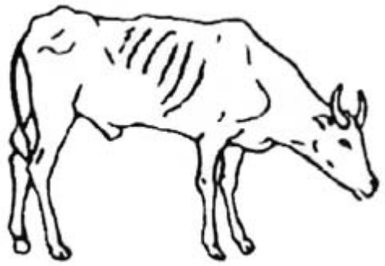
The milk cannot be used if the animal is treated with medicine.



1.4 Loss of market access

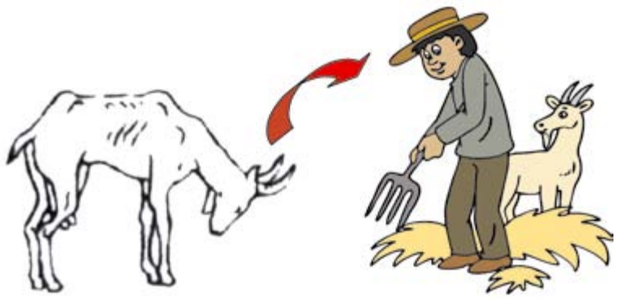
A sick and thin animal cannot be marketed for slaughter. The carcass will be rejected at the abattoir because it is unsafe for human consumption or downgraded because of poor quality.

There may be movement restrictions by Veterinary Services to prevent the spread of the disease. Even live animals may then not be sold or leave the farm.



1.5 Diseases can be transmitted to humans

Some diseases of livestock are important because they can be transmitted to humans and cause severe illness or even death. These diseases are called zoonoses.



People can contract these disease from –

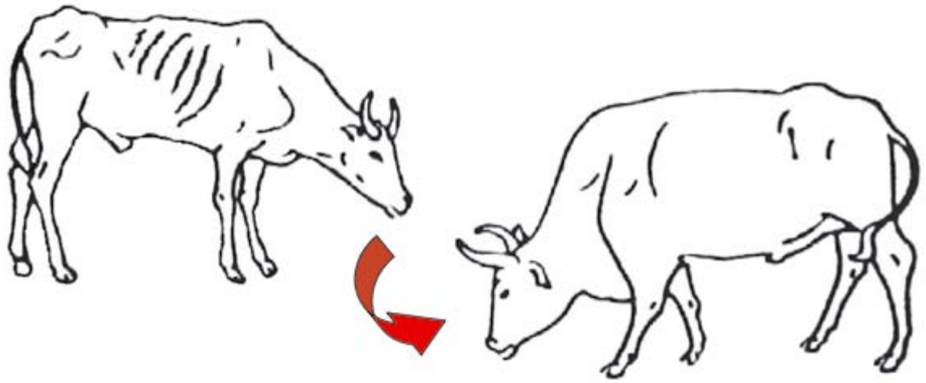
- drinking milk of a sick cow or ewe,
- eating meat of a sick animal, and
- coming into contact with tissue or fluids of an infected animal.

2. Ways in which infectious animal diseases are spread

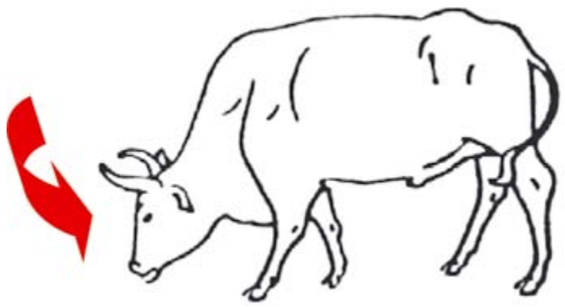
An infectious disease is a disease that is caused by germs. There are many kinds of germs like bacteria, viruses and protozoa. If the animal becomes infected with the germ it gets an infection which makes it sick.

A contagious disease is an infectious disease that easily spreads from one animal to another:

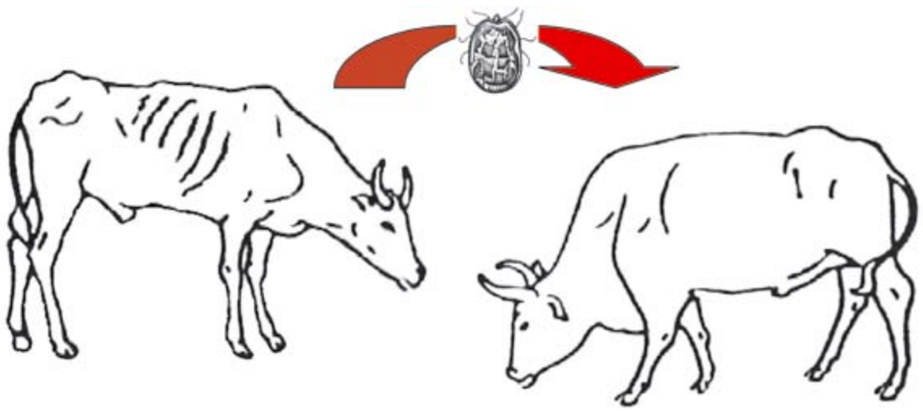
2.1 By direct contact



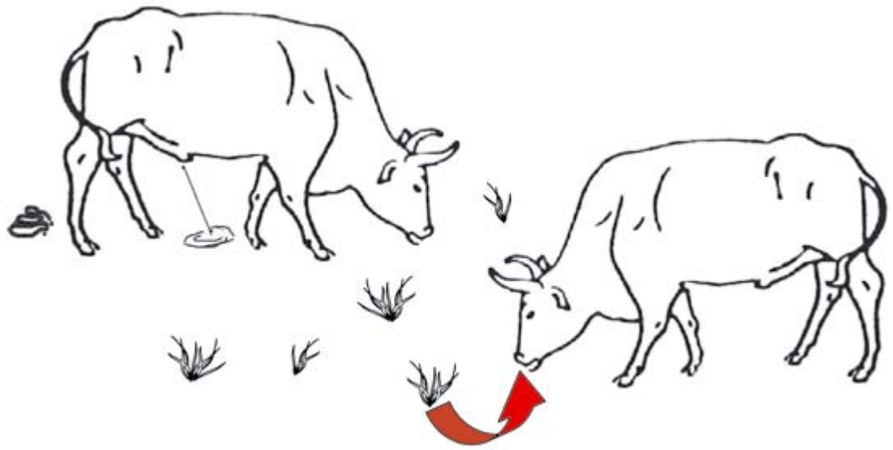
2.2 Through the air



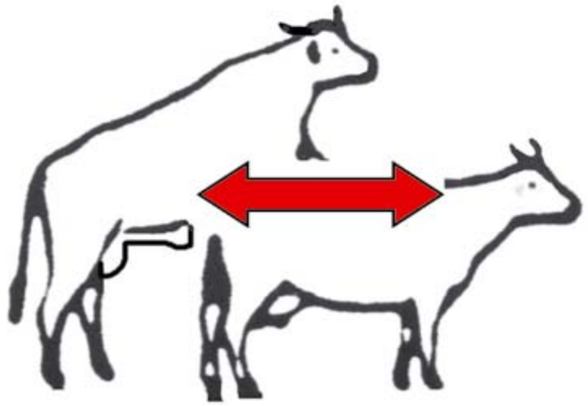
2.3 By insects such as ticks



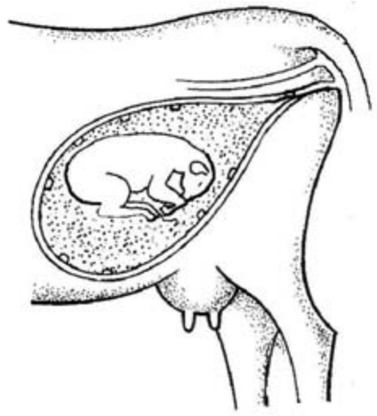
2.4 Through food and water



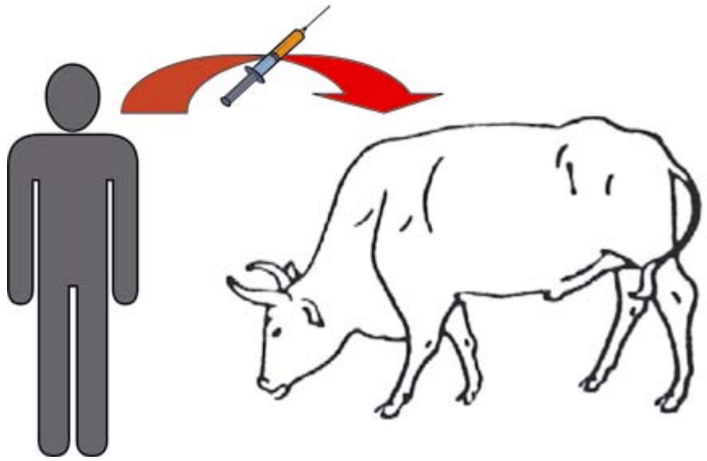
2.5 By mating



2.6 From female to the unborn young



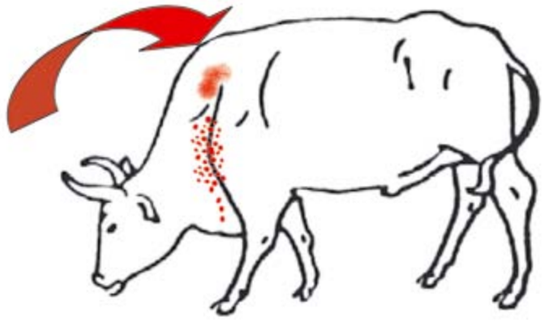
2.7 By humans using dirty needles or equipment



2.8 Through wounds

Wounds can be the result of –

- animals fighting,
- injuries in kraals and crush-pens,
- beating of animals, and
- attacks by dogs or wild animals.



3. Methods of disease control

The method of controlling a disease depends on the disease, the way it is spread and the economic importance to the farmer, the community, the country and internationally. The occurrence of diseases is area-specific and local veterinarians should be consulted.

The farmer can control many diseases by good management and vaccination.

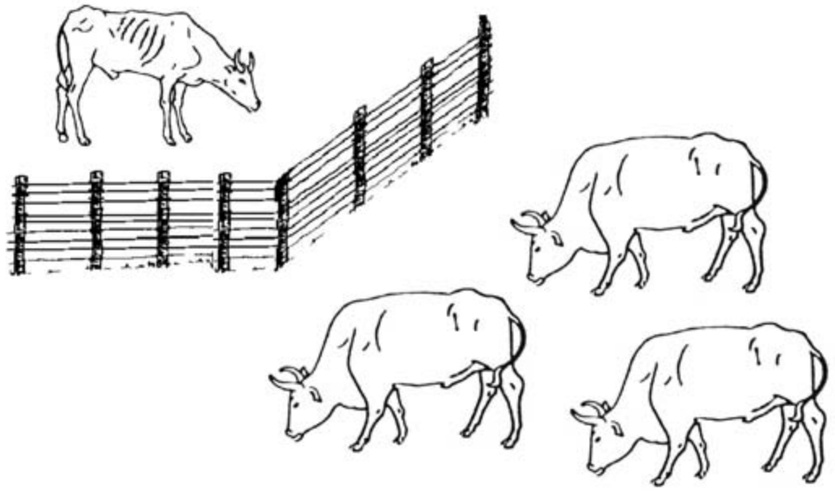
Some devastating diseases are controlled by the government.

The following steps will help prevent diseases and control the spreading of infectious or contagious livestock diseases.

3.1 Local farm-level disease control

- Vaccinate healthy livestock regularly against diseases.

- Separate sick animals from healthy animals.

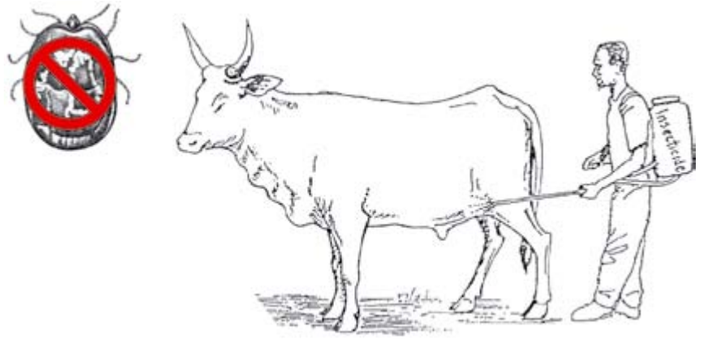


- Sick animals and healthy animals must not drink from the same trough.

- Sick animals and healthy animals must not eat from the same trough.

- Control ticks.

Regular tick control by spraying or the use of tick grease is important.



- Prevent overcrowding.

Too many animals kept in a small kraal helps spread disease.
Make sure there is enough space for all the animals.

- Clean kraals regularly.

Rake out the manure regularly.
The dung can be dried and burned or used as fertiliser on the fields.

- Do not build kraals next to the water source.

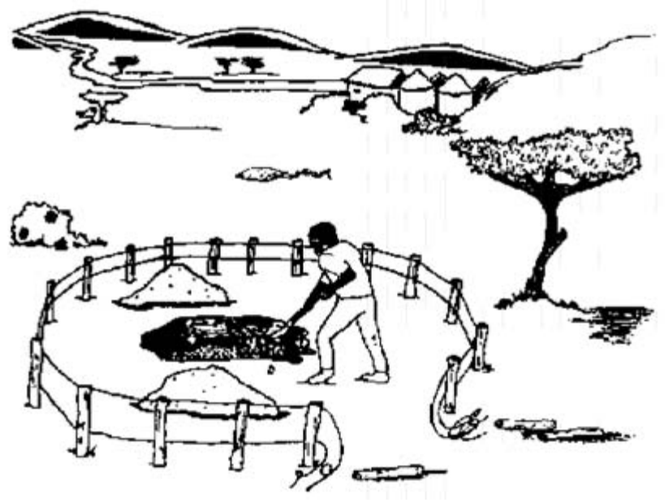
- Do not bury carcasses close to the water source.

- Prevent injuries to animals.
  Do not beat draught oxen.
  Make sure the yoke does not hurt the oxen.

Prevent the presence of sharp metal objects in kraals and mangas or in feed and water troughs.

- Prevent contamination of food and water sources.

  Do not leave carcasses of animals in the veld.
  Burn or bury the carcass.



- Prevent leaking water troughs.

  If the animals always stand in water, diseases can be transmitted. Maintain installations to prevent the leaking of water troughs.

- Always use clean instruments and equipment.

  Take syringes apart after use, clean well and put in boiling water for 15 minutes.

- Always wash hands before and after examining or treating a sick animal.

3.2 Government control of livestock diseases

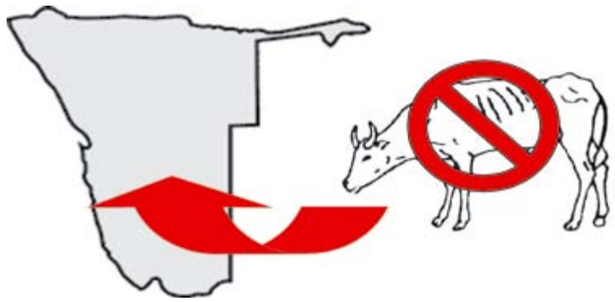
Some serious diseases are controlled by the government through the Directorate Veterinary Services of the Ministry of Agriculture, Water and Forestry.

The livestock industry is very important to Namibia's economy, therefore Veterinary Services must control animal diseases to protect the livestock industry and the livelihoods of farmers.

Veterinary Services protect the farmers' livelihoods by the following control measures:

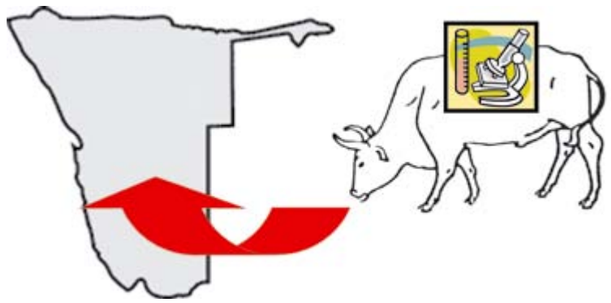
3.2.1 Import control

No animal or animal product carrying a disease may be imported into Namibia. A person who wants to import an animal or animal product has to apply for an import permit at Veterinary Services.



Veterinary Services will then check if any serious diseases like lung sickness or foot-and-mouth disease occur in the country or area of origin of this animal or these animals.

If there are serious diseases in the country or area of origin, Veterinary Services will not allow these animals or animal products to enter Namibia.



If there are no serious diseases in the country or area of origin, the animals may be tested for a number of diseases. Only if they are free from disease will the animals or animal products be allowed to enter Namibia.

All the countries in the world protect their farmers and livestock in a similar way.

All countries have to report the occurrence of diseases to the international organisation that controls animal diseases worldwide, namely the World Organisation for Animal Health (OIE).

3.2.2 Internal disease control

There are different ways in which Veterinary Services control diseases inside Namibia, but it needs accurate information to be able to do this.

This information is based on information supplied by the farmers to the stock inspectors and state veterinarians and on inspections done by Veterinary Services.

To enable Veterinary Services to protect the farmers' livelihoods, the farmers have to provide accurate information and cooperate with the officials from Veterinary Services.

- **Animal disease surveillance**

  Stock inspectors and state veterinarians regularly visit farms or crush-pens to carry out inspections of livestock.

The animals are examined and the findings recorded.

The farmer's stock card is checked.

- **Compulsory animal vaccination**

  There are a number of diseases against which all farmers have to vaccinate all their animals by law.

  These include the following:

  Anthrax – all livestock every year
  Brucellosis – all heifers under nine months of age
  Rabies – all dogs and cats every three years

  In areas where there is a danger of foot-and-mouth disease and lung sickness, all animals have to be vaccinated against these diseases once a year. This is done by Veterinary Services during the annual vaccination campaign.

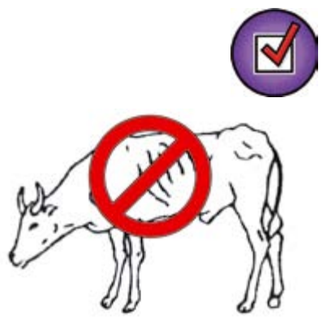
- **Animal movement control**

  To prevent diseases from being spread within the country, Veterinary Services have to place restrictions on the movement of animals.

  If a farmer wants to move cattle from one farm to another an Animal Movement Permit is required, which can be obtained from Veterinary Services.

  Veterinary Services will check the following:

  - Are there any serious diseases on the farm or in the area?
  - Were the animals vaccinated with the compulsory vaccines?
  - Is there a risk of spreading a disease?
  - Can the animals be identified?



  If no disease was reported for that farm or area and the animals were vaccinated and can be identified, Veterinary Services can issue an Animal Movement Permit if the officials are convinced that there is no risk of spreading a disease.

If Veterinary Services issue a permit for this animal movement it is only valid for a given time for the specifically identified animals and from one farm to the other as requested.

If there is any risk of spreading a disease Veterinary Services can refuse permission to move the animals or impose other restrictions such as quarantine and further inspections.

During such quarantine the animals are inspected regularly for signs of disease.

If there are no signs of disease and Veterinary Services are sure that there is no risk of spreading a disease, a movement permit can be issued.

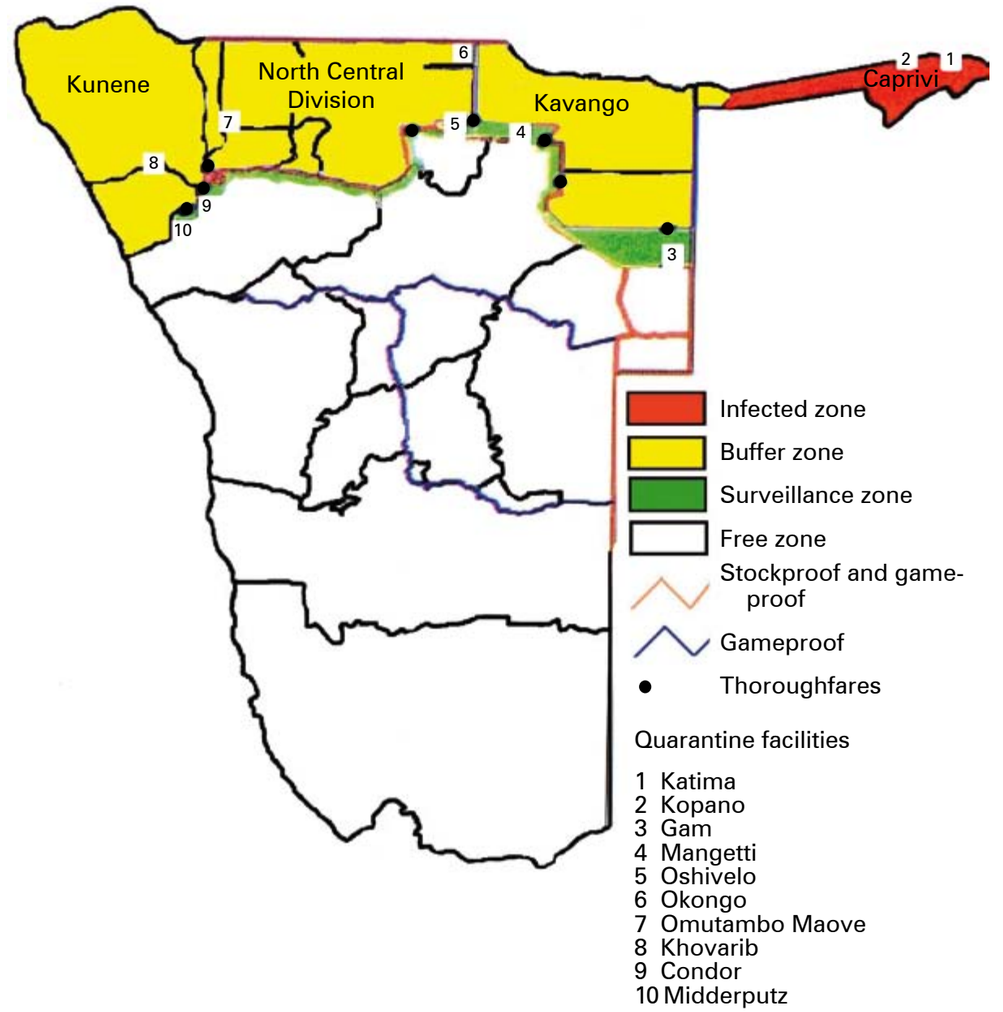
Many countries in the world are subdivided into zones where serious diseases like lung sickness and foot-and-mouth occur and zones where these diseases do not occur.

The export of livestock and meat is only allowed from zones that are free from these diseases.

The disease-free zones can only be kept disease free if very strict movement control is applied. This is regularly checked by the World Organisation for Animal Health (OIE).

Countries that want to import livestock or meat from another country also regularly check if this form of animal disease control is done properly for fear that they will carry diseases to their countries if they import from another country.

Therefore Namibia is also divided into animal disease zones and animal disease-free zones. (Refer to the map on the next page indicating animal disease zones in Namibia.) To protect Namibia's economy with regard to foot an dmouth disease, strict control over animal movements has to be applied.



CHAPTER 3
Treatment of Wounds and other Injuries

Livestock regularly gets injured. Injuries may occur for many reasons, which can be prevented by livestock management measures and removing dangerous objects from the animals' environment.

The farmer should aim at preventing injuries to his or her animals by ensuring that –

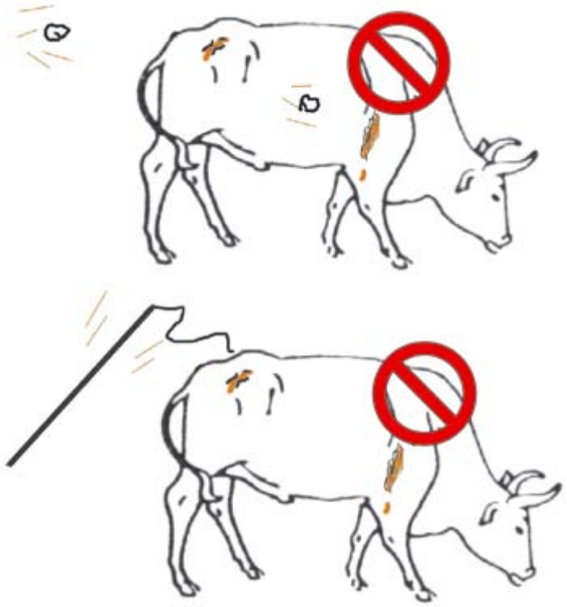
- the animals are dehorned;

- sharp metal objects in crush-pens and kraals are avoided;

- sharp objects on or in feed and water troughs are avoided;

- fighting of animals is avoided by early castration of bull calves;

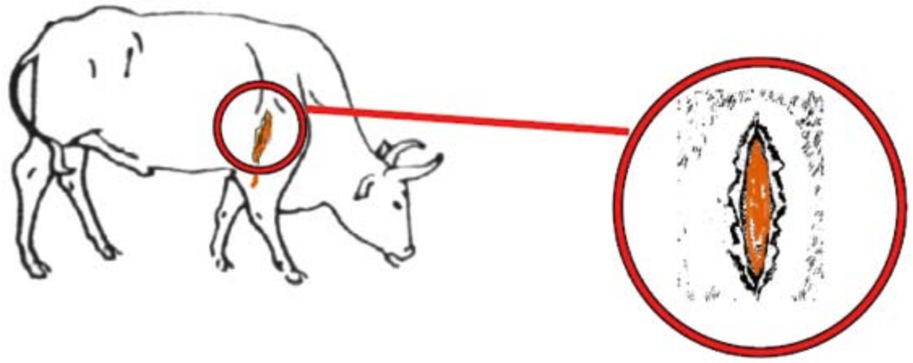
- the animals are not abused by avoiding throwing stones at them or beating them;



- the yoke of a draught animal fits well.

1. Treatment of superficial skin wounds

In most cases superficial skin wounds can be treated by the farmer.



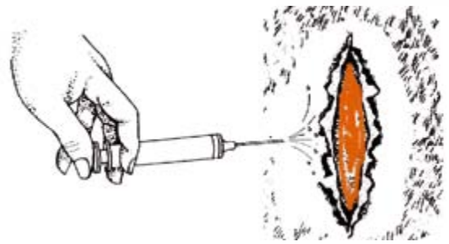
Wash hands thoroughly with soap and water.

Cut the hair around the wound.

Boil some water and let it cool.

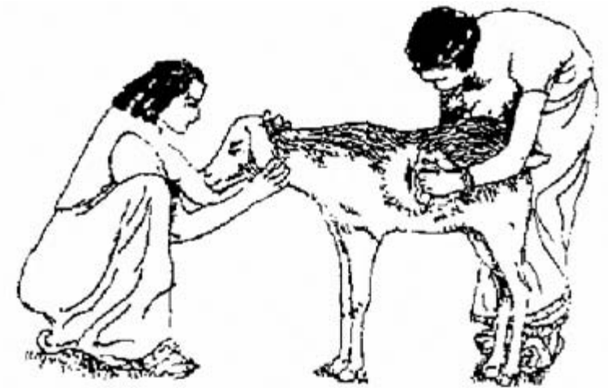
Add disinfectant to the water once it has cooled.

Wash the wound and surrounding area thoroughly with the water and antiseptic until all dirt is removed.



Squirt water and disinfectant into the wound until it is clean.

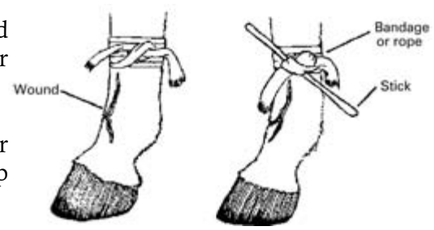
Dry the wound with a clean, dry cloth.



Spray wound spray into the wound and on the surrounding area.

For very deep wounds clean the wound as described above, but call a veterinarian to assist with further treatment.

If the wound is on a leg and bleeds a lot, the farmer can apply a tourniquet for 20 minutes to help stop the bleeding while the wound is treated.



2. Treatment of penis injuries of bulls

Bulls sometimes injure themselves serving cows or get an inflammation of the foreskin, which is often a result of tick bites.

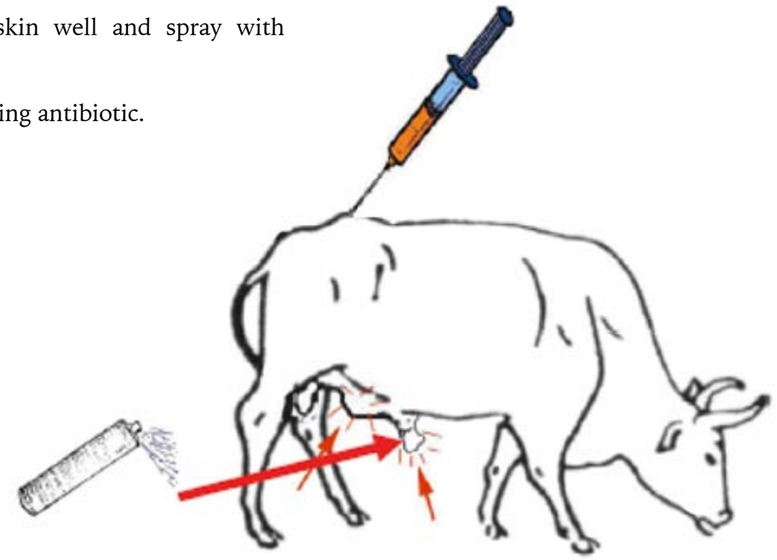
Such bulls will not be able to serve cows and that causes severe losses to production, as no calves will be born.

The treatment of such injuries should be given by a veterinarian.

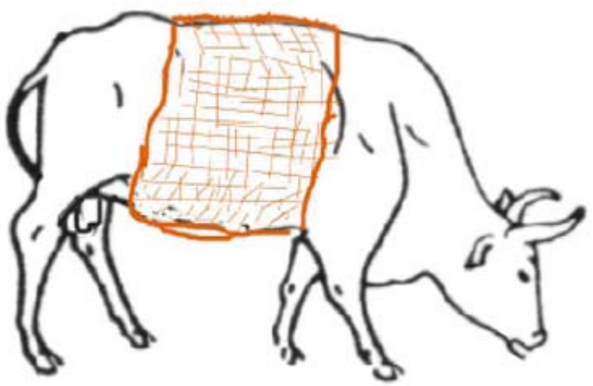
The farmer can, however, initiate emergency treatment on the farm.

Treatment on the farm:

- Clean the foreskin well and spray with wound spray.
- Inject a long-acting antibiotic.



- Put a bandage made of hessian bags around the whole body to press the penis against the body (this will help to reduce the swelling).
- The bandage has to be replaced every day after cleaning the foreskin.



CHAPTER 4
Poisoning in Livestock

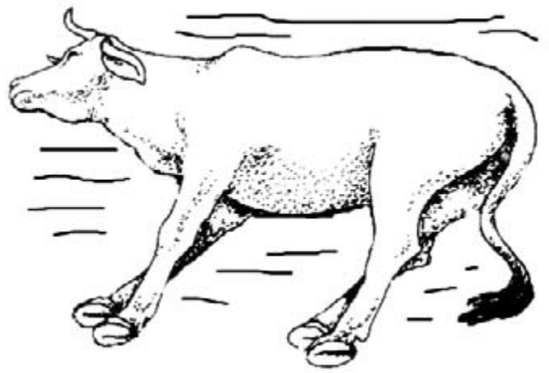
Poisoning is a regular occurrence among livestock. This can occur when animals eat poisonous plants when grazing, drink water contaminated with poison or are exposed to chemicals or poisonous refuse.

1. Poisonous plants and treatment of plant poisoning

1.1 Plants affecting the heart

These plants often cause severe stock losses in the early spring and summer, usually after the first rains.

The farmer will notice the animal collapsing after being herded or after drinking water.



Treatment is usually not effective, as the animal dies very quickly.

There are some charcoal-based poison antidotes available, like PPR Powder and Activated Charcoal Powder. These are mixed with water and given by mouth.

If the animal survives the poisoning it should rest, because the damage to the heart can cause it to die when it is herded or used as a draught animal.

Prevent poisoning by avoiding pastures where poisonous plants occur. If the pastures have to be used, prevent the animals from drinking water for one day after returning from grazing.

- ***Dichapetalum cymosum* (gifblaar, mubeti, poison leaf)**

The plant occurs only in the northeastern and eastern parts of Namibia and in the Sandveld areas.

Many plants look similar, but the leaves of poison leaf are smooth and hairless and have a distinct loop venation.

- ***Drimia* (*Urginea*) *sanguinea* (slangkop)**

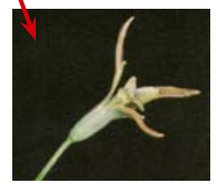
The plant occurs throughout Namibia and usually appears before the first rains.

The plant has a distinct red bulb.

- ***Dipcadi glaucum* (poison onion, malkop-ui)**

The plant occurs in most parts of Namibia.

It causes abnormal behaviour like head pushing and aimless wandering.



- ***Ornithoglossum vulgare* (Cape poison onion, Karoo-slangkop)**

The plant occurs throughout Namibia and usually starts flowering in August.

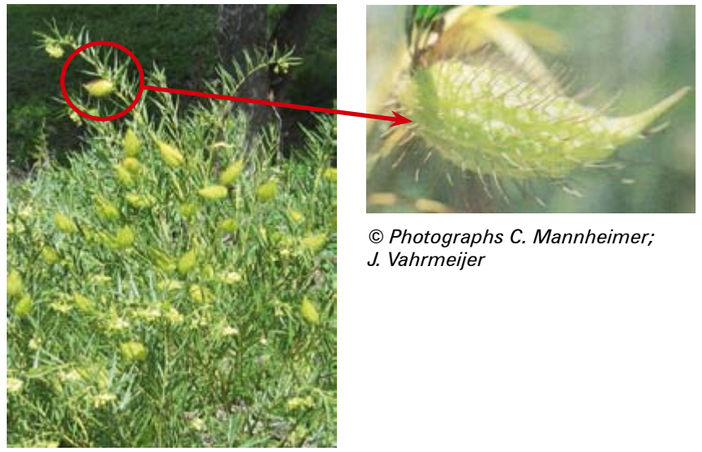
- ***Pseudogaltonia (Lidneria) clavata* (Cape hyacinth, groenlelie)**

The plant is common throughout Namibia and flowers from October to December.

- ***Gomphocarpus fruticosus (Asclepias fruticosa)* (wild cotton, milkweed)**

The plant occurs throughout Namibia in disturbed rangeland.

It is not a common cause of poisoning.



© Photographs C. Mannheimer; J. Vahrmeijer

- ***Pavetta schumanniana* (gousiekte tree)**

The plant occurs in the far northeastern areas of Namibia (Kavango and Caprivi).

It causes damage to the heart and animals can die up to six weeks after eating it.

© Photographs J. Vahrmeijer

1.2 Plants affecting the digestive system

- ***Geigeria ornativa* (vermeersiektebos)**

The plant occurs in most parts of Namibia, especially in overgrazed rangelands.

In sheep and goats it causes paralysis of the oesophagus so that the animals cannot swallow and appear to be vomiting.

In cattle it mainly causes stiffness of the muscles and eventually paralysis.

© Photograph J. Vahrmeijer

- ***Solanum lichtensteinii (incanum)* (thorn apple, gifappel)**

The plant occurs in most parts of Namibia – particularly around kraals and homesteads.

It causes severe diarrhoea, salivation, difficult breathing, cramps and paralysis.

© Photographs J. Vahrmeijer

- ***Ricinus communis*** **(castor-oil plant)**

The plant occurs in most parts of Namibia – particularly around kraals and homesteads.

The plant causes severe bloody diarrhoea, listlessness, convulsions, paralysis and death within ten hours.

© Photographs J. Vahrmeijer

- ***Gnidia polycephala*** **(January bush)**

The plant occurs in most parts of Namibia and is most poisonous in the flowering stage during winter.

Poisoning causes severe diarrhoea, rapid breathing and sometimes death.

© Photographs J. Vahrmeijer

1.3 Plants affecting the nervous and locomotory system

- ***Solanum tettense (kwebense)*** **(maldronksiektebos, rooibessie)**

The plant occurs in most parts of Namibia.

Poisoning causes permanent damage to the brain.

The animal stumbles as if it is drunk.

Animals often injure themselves falling about, and do not recover from the poisoning.

© Photograph J. Vahrmeijer

- ***Kalanchoe lanceolata*** **(ombakapuke, plakkie)**

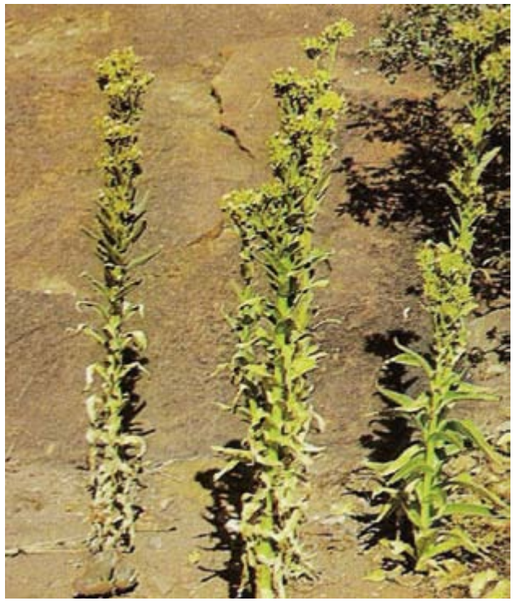
The plant occurs in most parts of northern and central Namibia.

Poisoning affects mainly sheep and goats, but cattle can also be affected.

It causes a syndrome called “krimp-siekte”.

Poisoning causes the animal to bloat followed by trembling of the muscles, extreme weakness, paralysis and eventually death.

Poisoning resembles botulism, particularly in cattle.



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1.4 Plants affecting the blood

Many plants contain a poisonous substance called nitrate. Poisoning with nitrate causes the blood to lose its ability to carry oxygen and the animal dies as a result of that.

The blood of the dead animal looks brown instead of red.

***Amaranthus thunbergii* (pigweed, cock's comb)** is a common cause of nitrate poisoning.

The nitrate content of such plants is very high if they grow near kraals.

Treatment is done only by intravenous injection of methylene blue.

Many plants also contain high levels of a poison called prussic acid.

Poisoning with prussic acid causes the oxygen carried by the blood not to be released in the body and the animal dies as a result of that.

The blood of the dead animal is bright red.

Lush green pastures that have wilted because of lack of rain can cause prussic acid poisoning.

Another common cause of prussic acid poisoning is if the animals go into the sorghum or mahangu fields when the plants are wilted.

Prussic acid poisoning can be treated and prevented by a drug called "HYPO".

Treatment

- Use 50 g (10 teaspoons) of HYPO mixed with water for sheep.
- Use 200 g (10 big spoons) of HYPO mixed with water for cattle.

Prevention

- Mix HYPO with drinking water at 2 kg HYPO per 1 000 litres of drinking water.
- Mix 3 kg lime sulphur per 45 kg lick supplement.

1.5 Plants affecting the skin

Some plants cause poisoning which is manifested by severe skin lesions.

These lesions are not the direct result of the plant poisoning but rather a secondary result due to liver damage caused by the plant.

Because of the liver damage the animal gets sunburnt very easily. This sunburn mainly affects the pale areas of the skin.

Treatment of these animals includes putting them in the shade and only feeding them dry hay. Green grass will worsen the condition. In very bad cases a veterinarian should be called to treat the animal with drugs, which will help the liver to recover.

- ***Lantana camara* (lantana)**

  This plant is a declared weed. It occurs everywhere in Namibia and many households keep it at their homesteads because of the beautiful flowers.

- ***Tribulus terrestris* (devil's thorn, dubbeltjie)**

  The plant occurs everywhere in Namibia.

  When this plant has wilted and is consumed by animals, it gives rise to liver damage, especially in sheep and goats.

  These animals will develop bad sunburn and swelling of the head and teats.

2. Chemical poisoning

Many animals are poisoned with chemical substances because they have access to feed stores or to discarded chemical refuse.

2.1 Lead poisoning

This arises mainly from cattle chewing on and swallowing old batteries or licking the tins of old lead-based paints.

Signs of poisoning are usually seen two to three days after taking in the poison.

The animals often bellow, stagger around as if they are blind and froth appears at the mouth. They often get muscle twitching and die.

If the animal ingested only a small amount of poison it lives longer and often shows constipation followed by diarrhoea before bellowing. Later blindness can even occur.

Treatment

Treatment is usually not effective.

The farmer can try to treat it by giving the animal activated charcoal and a laxative like Epsom salts.

Prevention

Do not litter.

Prevent access of animals to refuse dumps.

2.2 Urea poisoning

Urea poisoning regularly occurs if animals have access to urea fertiliser or overeat on urea-containing lick supplements.

Sometimes the lick gets wet in the rainy season and the urea dissolves. If the animals drink the water in the lick trough they can be poisoned.

The animals usually show bloat, abdominal pain, difficulty in breathing, shivering and staggering around and then collapse, bellowing and struggling. They die very rapidly.

Treatment

Treatment, if given quickly, can be effective in many cases.

Give 1 bottle of vinegar (750 ml) mixed with 1 litre of water immediately. This may have to be repeated if the animal does not respond.

Prevention

Store licks and fertilisers in a secure place where the animals cannot reach it.

Make animals used to urea-containing lick supplements gradually.

Do not use urea-containing lick in the rainy season, or provide lick troughs with lids so that the lick does not get wet.

2.3 Nitrate poisoning

Nitrate poisoning has been described under plant poisonings affecting the blood.

Apart from poisoning by plants containing nitrate, animals are often poisoned by nitrate-contaminated water sources.

Animal dung contains relatively high levels of nitrate. If, after heavy rains, the nitrate dissolves and is washed into the water source, the animals can get nitrate poisoning from drinking the water.

Prevention

Do not build kraals next to boreholes!

CHAPTER 5
Disease Reference and Treatment Guidelines

The accurate diagnosis of a disease that affects livestock has to be made by a veterinarian. Many diseases cannot be accurately diagnosed by a veterinarian by examining the animal alone. Often samples have to be analysed in a laboratory to make an accurate diagnosis of the cause of the disease.

Many diseases are characterised by very specific signs. Most diseases share common signs. That means if an animal shows certain signs of a disease, there are many possibilities of what the cause of the disease could be. This can lead to inappropriate treatment or uncontrolled spread of serious diseases because they were not correctly diagnosed and the proper control measures were not taken.

To determine the cause of a disease the veterinarian has to consider many factors:

- The environment
- Factors that may help the disease to develop
- Presence of vectors (like ticks transmitting certain diseases)
- The duration of the disease from first-observed abnormality to the current signs of disease or death
- The signs of the disease
- The severity of the signs
- What age group is mainly affected
- Whether male or female animals are affected, or both
- How many animals of the herd are affected – morbidity
- How many of the affected animals die – mortality
- Findings in the dead animals
- Laboratory examination results

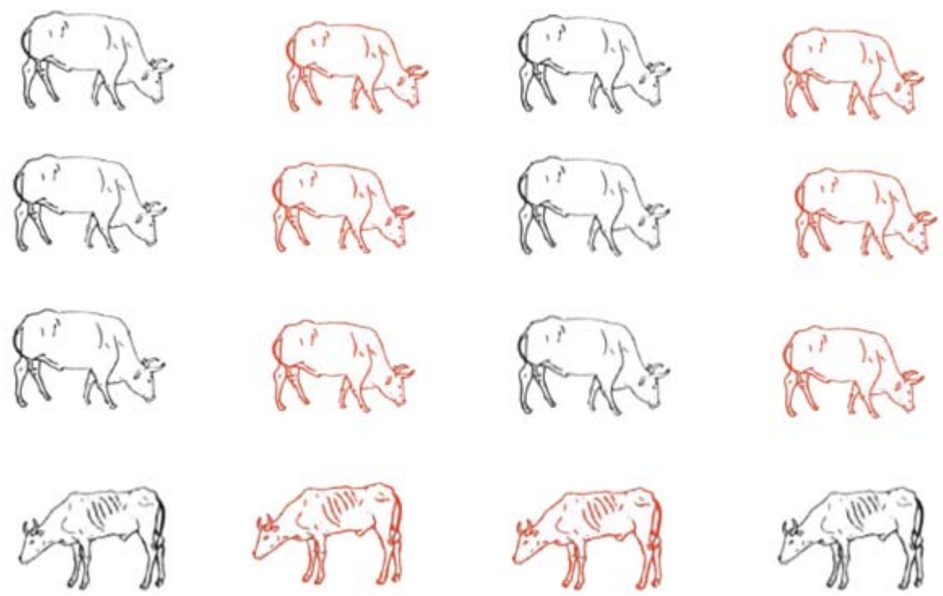
It is of the utmost importance that the farmer responds quickly to abnormalities observed in his or her livestock in order to –

- *prevent the loss of his or her animal or loss of production by his or her animals, and*
- *help prevent the spread of serious diseases throughout the herd, the area or the country.*

If an animal gets sick, separate it from the other animals and observe the sick animal closely. Also observe the other animals closely to see if they start showing similar signs.

IN TERMS OF ANIMAL DISEASE OCCURRENCE, THE FOLLOWING SCENARIOS MAY EXIST:

HIGH MORBIDITY

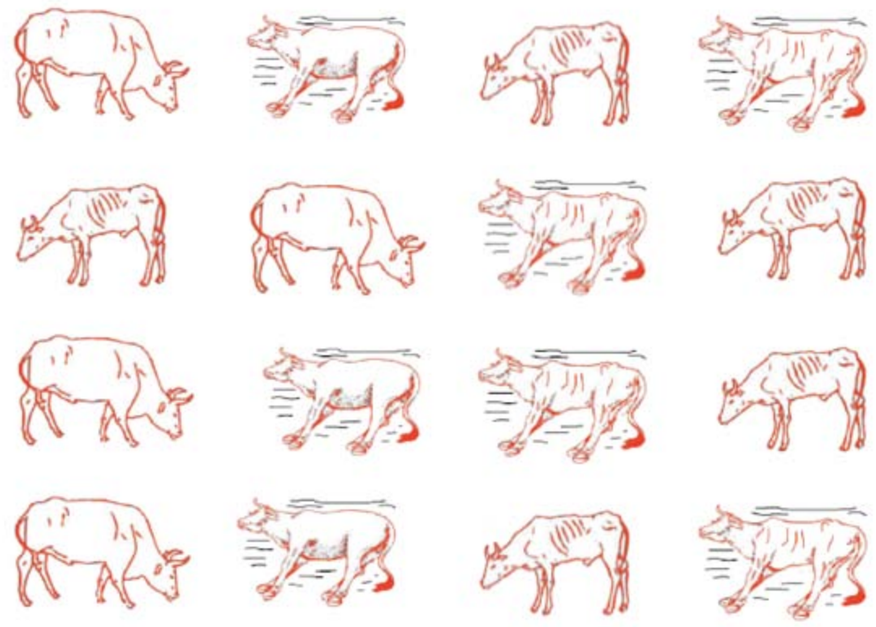


Many animals in the herd show the disease.

LOW MORBIDITY

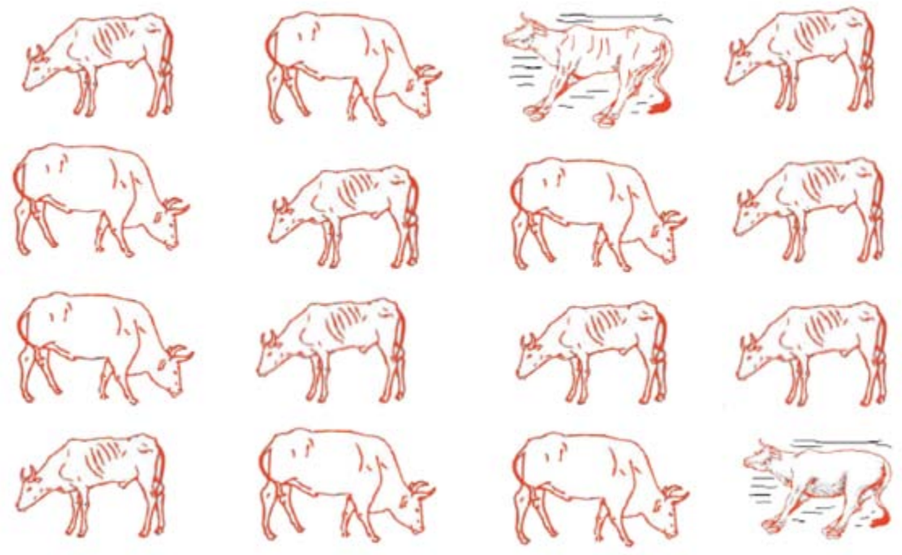
Few animals in the herd show the disease.

HIGH MORTALITY



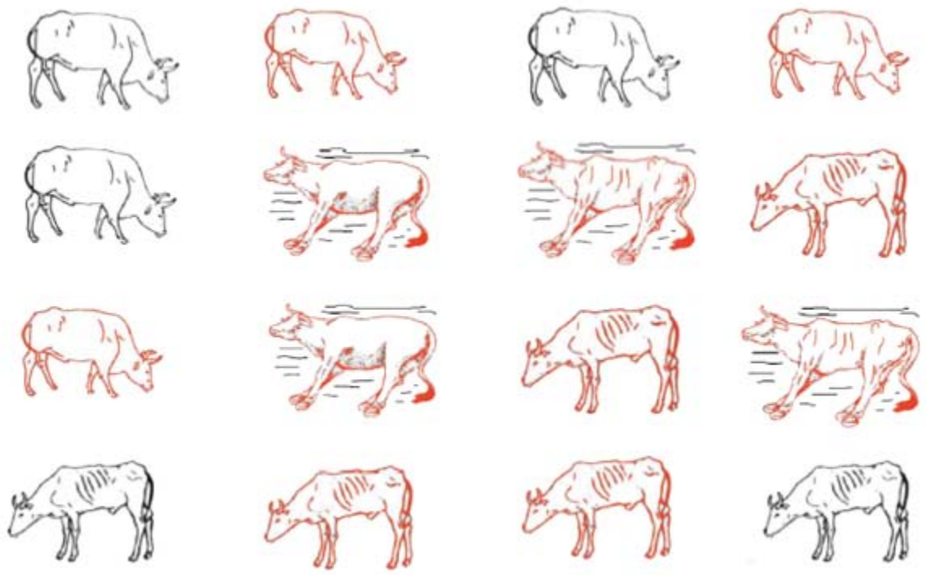
Many of the affected animals die.

LOW MORTALITY



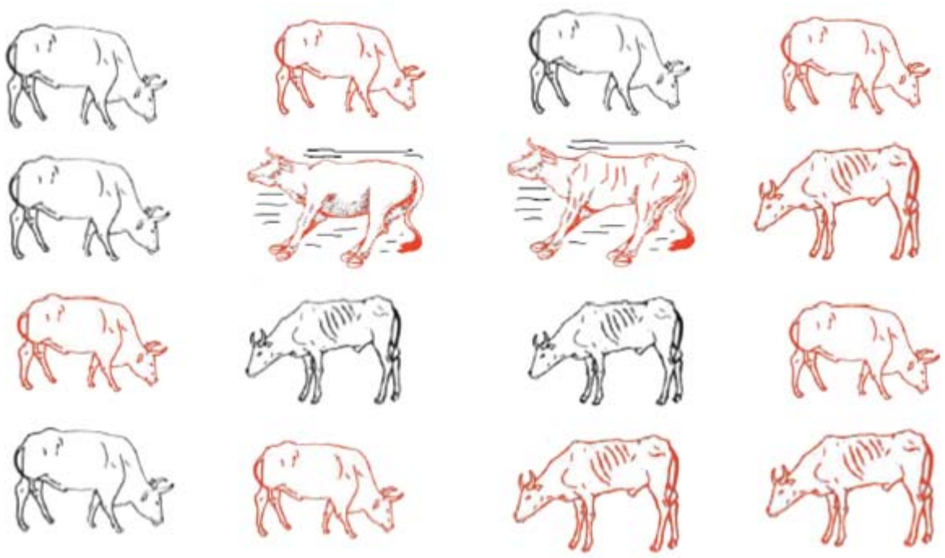
Few of the affected animals die.

HIGH MORBIDITY – HIGH MORTALITY



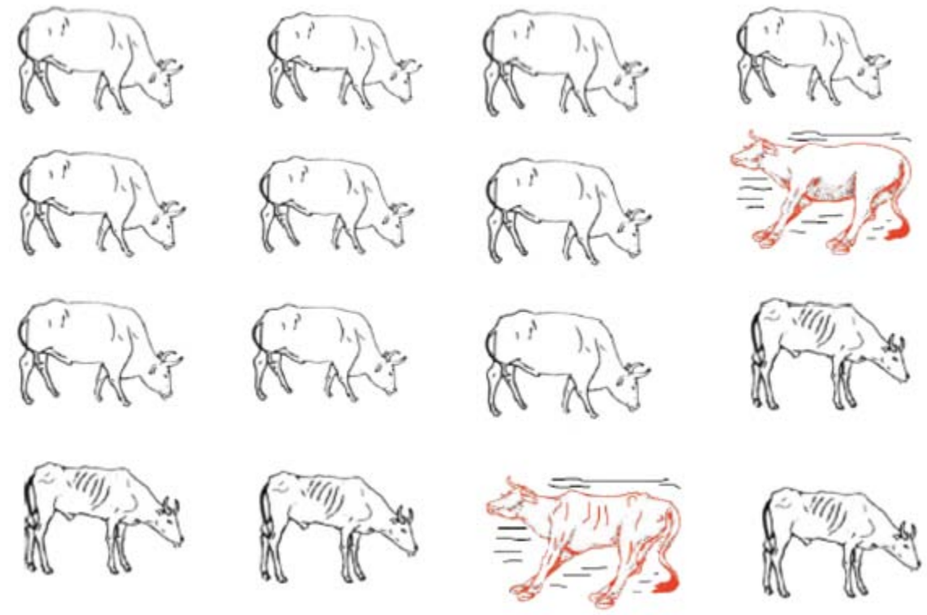
Many animals in the herd are affected by the disease of which many die.

HIGH MORBIDITY – LOW MORTALITY



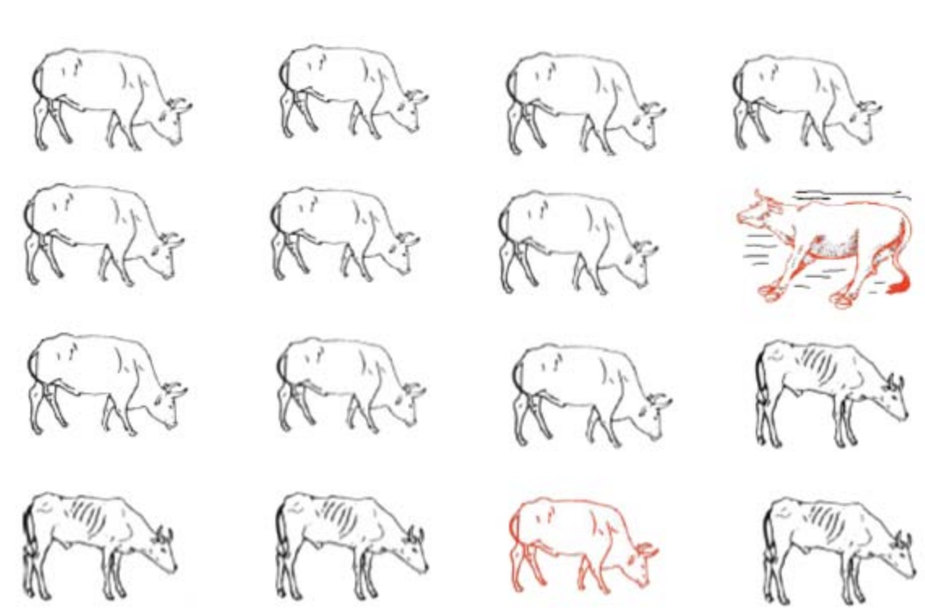
Many animals in the herd are affected by the disease but very few die.

LOW MORBIDITY – HIGH MORTALITY



Few animals in the herd get the disease, but most of those which get the disease die.

LOW MORBIDITY – LOW MORTALITY



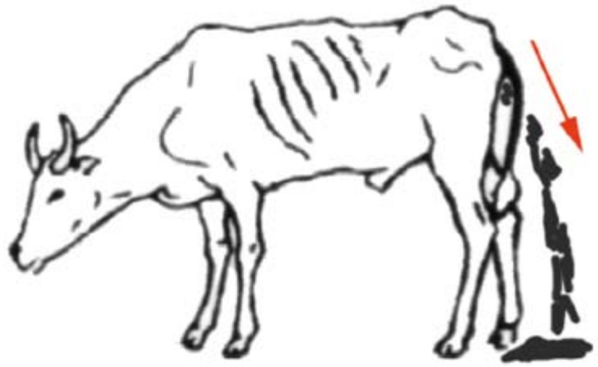
Few animals in the herd get the disease, and few of those that get the disease die.

The list of diseases below can help the farmer to determine how serious the problem is. If a single animal is affected the farmer can consider treating the animal himself or herself. If more animals show the same signs of the disease the farmer should get veterinary help immediately in order to prevent a disease outbreak.

Some of the diseases listed were eradicated from Namibia a long time ago. It is important to be on the lookout for these diseases – if no other disease description fits the picture or the disease has a very high morbidity and/or mortality, a responsible farmer would inform Veterinary Services immediately of the occurrence of this abnormality.

This is not a complete list of all the diseases affecting livestock and shows the disease/ syndrome as observed by the lay person.

1. DIARRHOEA



General treatment of diarrhoea

With diarrhoea the animal loses a lot of water and salt from the body. The aim of treatment is to replace the lost water and salt and to try and get the faeces more solid.

Make a mixture of
- 6 teaspoons sugar
- ½ teaspoon salt
- 1 litre water

and dose above mixture per 10 kg body weight to replace lost fluids.

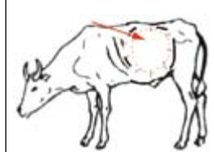
Addisional anti diarrhoea treatment:

- 5 heaped tablespoons Kaolin powder mixed with 1 litre water for cattle.
- 1 heaped tablespoon Kaolin powder mixed with a 250 ml cup of water for small stock.

Specific treatment depends on the possible causes of diarrhoea.

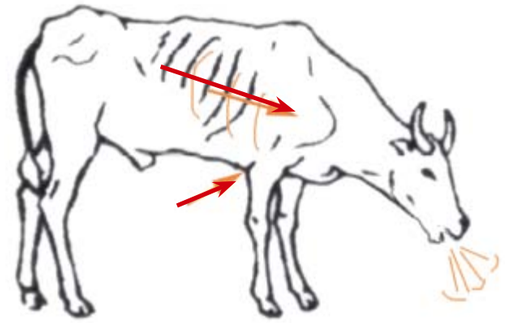
Possible cause	Other signs	Diagnosis	Treatment	Prevention
COCCIDIOSIS Disease caused by small organisms living in the intestine Under stress conditions they rapidly multiply and cause diarrhoea	Usually young calves Sometimes blood in faeces Low morbidity – low mortality	 Veterinarian or laboratory	 Sulpha antibiotics Give fluid replacement	 Prevent leaking water troughs  Clean kraals regularly  Prevent overcrowding in kraals
INTERNAL PARASITES Roundworms, flukes or tapeworms can cause diarrhoea   	All ages of animals can be affected More severe diarrhoea in calves Low morbidity – low mortality  One may observe pale mucous membranes which indicate anaemia (loss of blood makes the inside of the eye very pale)  Some animals may develop bottle jaw, which is a swelling under the neck	 Veterinarian or laboratory	 Treatment with specific worm remedies	 Prevent leaking water troughs  Clean kraals regularly  Prevent overcrowding in kraals  Prevent animals drinking at natural waters

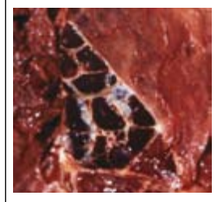
Possible cause	Other signs	Diagnosis	Treatment	Prevention
E. COLI ENTERITIS Esherichia coli is a bacterium that occurs in the intestine If these bacteria grow rapidly they can cause fatal diarrhoea	Severe watery diarrhoea, weakness and death in calves Low morbidity – high mortality	 Veterinarian or laboratory	 Long-acting antibiotics Give fluid replacement	 Prevent leaking water troughs  Clean kraals regularly  Prevent overcrowding in kraals  Vaccination
SALMONELLA (CALF PARATYPHUS) This is an acute bacterial disease that can rapidly spread within a group of calves	Very often severe bloody diarrhoea in calves Can cause sudden death of calves In dead calves the liver looks as if it has been boiled Low morbidity – high mortality	 Veterinarian or laboratory	 Long-acting antibiotics Give fluid replacement	 Prevent leaking water troughs  Clean kraals regularly  Prevent overcrowding in kraals  Vaccination

Possible cause	Other signs	Diagnosis	Treatment	Prevention
BOVINE VIRAL DIARRHOEA This disease is caused by a virus and mostly occurs in intensive calf-rearing systems	Can be mild diarrhoea or severe bloody diarrhoea Low morbidity – low mortality The incidence of abortions or low conception rates within the cow herd can indicate the presence of the virus in the herd	 Veterinarian or laboratory	 Long-acting antibiotics are only supportive and prevent complications by bacterial infections Give fluid replacement	 Prevent overcrowding in kraals  Vaccination
PLANT POISONING  Castor-oil plant  January bush	Exclusion of other causes of diarrhoea and circumstantial evidence like the presence of plants in the pasture and observation of animals ingesting the plants	Presence of these plants in the pasture Evidence of animals eating the plants	Give fluid replacement PPR or activated charcoal	Avoid access to poisonous plants
GRAIN OVERLOAD Pasty, foul-smelling diarrhoea as result of overeating on grain	Animals getting into feed store or mahangu field Animals overeating on supplementary feed without slowly getting used to it  The animals are often bloated	The diagnosis can be made from the signs of bloat, diarrhoea and access to abnormally large quantities of concentrate feed The rumen content is acidic	 Withdraw the concentrate food until the animals are better  Only give hay during recovery	 Slowly get animals used to the concentrate feed Start with small quantities and gradually increase the amount of feed

Possible cause	Other signs	Diagnosis	Treatment	Prevention
BOVINE MALIGNANT CATARRH (*SNOTSIEKTE*) A severe disease caused by a virus Occurs where wildebeest come into contact with livestock	 Inflammation and reddening of the eye  Nasal discharge  Severe inflammation of the mouth Low morbidity – high mortality	 Veterinarian or laboratory	 No treatment	 Report to Veterinary Services immediately
RINDERPEST Disease eradicated in Namibia, but still occurs elsewhere in Africa	Severe bloody diarrhoea and death within two days  Severe inflammation of the eyes  Salivation as a result of inflammation of the mouth  Severe inflammation of the mouth High morbidity – high mortality	 Veterinarian or laboratory	 No treatment	 Report to Veterinary Services immediately

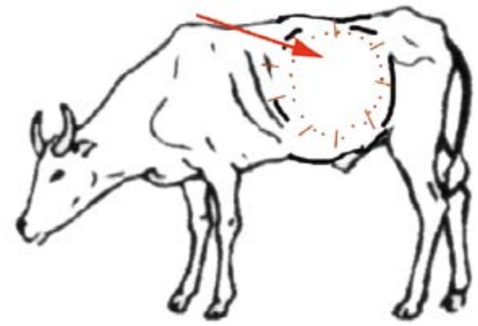
2. COUGHING



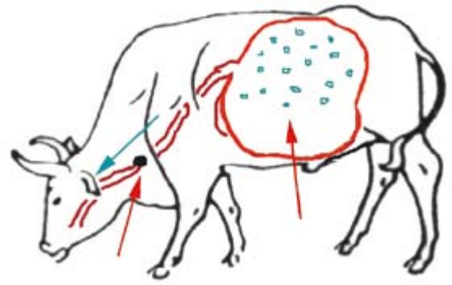
Possible cause	Other signs	Diagnosis	Treatment	Prevention
CONTAGIOUS BOVINE PLEURO PNEUMONIA (LUNG SICKNESS) The occurrence is limited to some northern and eastern parts of the country where it occurs sporadically	 The animals struggle to breathe  The lung tissue is solid and covered with a layer of fibrin  There is accumulation of fluid in the chest cavity High morbidity – high mortality in unvaccinated livestock	 Veterinarian or laboratory	 No treatment	 Report to Veterinary Services immediately Vaccination done only by Veterinary Services in certain areas

Possible cause	Other signs	Diagnosis	Treatment	Prevention
PASTEUREL-LOSIS This is an acute bacterial pneumonia	 Animals often have diarrhoea and a swelling on the lower neck  The lungs in the dead animal are usually dark blue-red Low morbidity – high mortality in unvaccinated livestock	 Veterinarian or laboratory	 Long-acting antibiotics	 Vaccination  Prevent overcrowding in kraals
LUNG WORM The worm infestation causes irritation of the airpipe and lungs	Sometimes the animals tire easily when herded or show coughing spasms Low morbidity – low mortality	 Veterinarian or laboratory	 Drench with specific worm remedy	 Prevent overcrowding in kraals

3. BLOAT



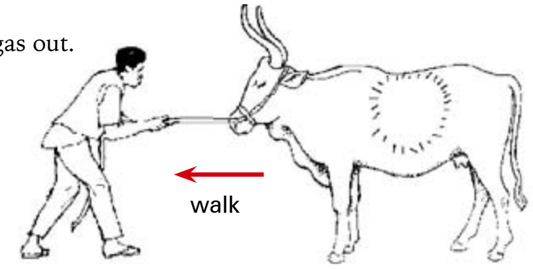
The animal shows distension of the left side of the body, which may be so severe that is has difficulty to breathe.

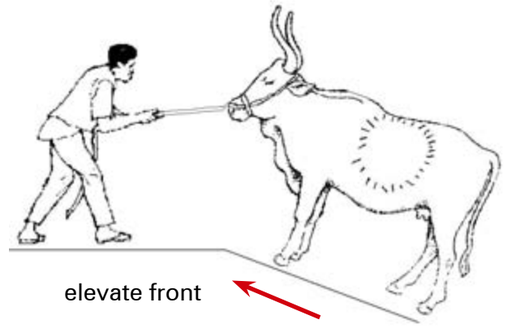


Bloat can occur when the gas normally formed in the rumen cannot escape because of a blockage or when too much gas is formed in the rumen.

General treatment for bloat

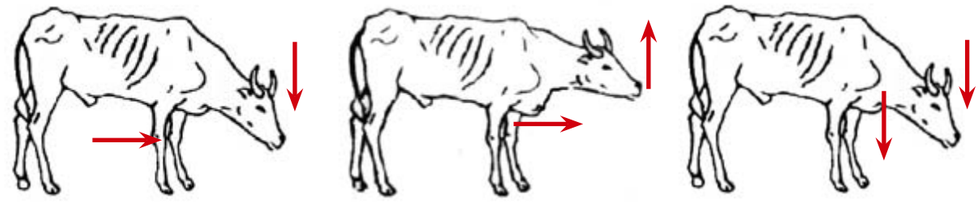
- Try to make the animal walk to get the gas out.
- Try to elevate the animal's front to get the gas out.
- Determine the most likely cause for the bloat (refer to the table on the next page) and treat accordingly.





Possible cause	Other signs	Diagnosis	Treatment	Prevention
UREA POISONING	Animal staggers as if drunk The animal may bellow and experience stomach cramps or have difficulty to breathe	Access to urea	Vinegar and water given by mouth	Prevent access to fertilisers and avoid overeating on lick containing urea
GRAIN OVERLOAD	Diarrhoea which is very smelly, like acid	Access to too much concentrate feed	Antacid given by mouth	Prevent excessive concentrate feed intake
FROTHY BLOAT	Animals on very lush green pastures The animal suddenly bloats without other symptoms If the bloat gets very bad the animal may have problems with breathing		Make the animal move If that does not help give "Bloat Guard" by mouth In very bad cases, put in a trocar	
FREE GAS BLOAT	Usually a blockage of the oesophagus causes this bloat because the gas cannot escape		Give some cooking oil to attempt to make the blockage move If that is not successful a veterinarian should be asked for help	

4. LAMENESS

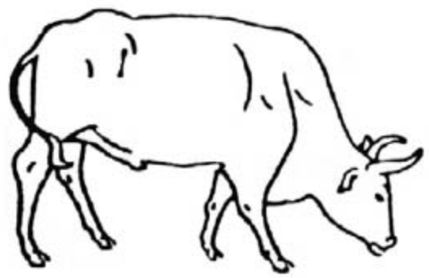


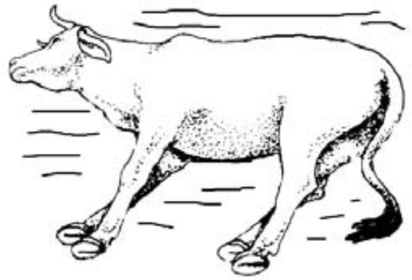
Possible cause	Other signs	Diagnosis	Treatment	Prevention
INJURY Injuries like bruising, cuts or bone fractures can cause moderate to severe lameness	Individual animals limp on one or more limbs Sometimes a swelling is seen Sometimes it is just a stick between the hooves	By visual inspection of the painful limb	Rest – keep the animal in the kraal until it is better  Inject long-acting antibiotic if there is an infected wound	Avoid situations where animals fight  Prevent sharp metal objects in kraals and mangas, or feed and water troughs
PHOSPHATE DEFICIENCY Phosphate is required in the body for strong bone structure The grazing in Namibia is generally deficient in phosphate The lameness is generally seen in all four limbs	 No phoshate lick available to the animals Often walk with arched back	Circumstantial evidence	 Supply phosphate lick  Inject phosphate containing medication or "Phosamine" "Metabolic"	 Make phosphate lick available  Supply P12  Supply salt lick

Possible cause	Other signs	Diagnosis	Treatment	Prevention
THREE-DAY-STIFF SICKNESS (EPHEMERAL FEVER) A viral infection affecting the joints causing severe joint pain	Usually occurs after good rains – transmitted by insects Animals may lie down and not walk at all Can also affect the lungs Low morbidity – low mortality	 Veterinarian or laboratory	 Inject long-acting antibiotic to prevent pneumonia	 Vaccination Avoid housing animals in low-lying areas and close to open waters Use insect repellents
PLANT POISONING  *Geigeria*  *Crotolaria*	*Geigeria* plant poisoning causes muscle pain resulting in stiffness and lameness in cattle *Crotolaria* plant poisoning causes inflammation of the hooves – sometimes the hooves grow very long as a result	Clinical signs and circumstantial evidence of the plant being consumed	 Anti-inflammatory drugs are useful to alleviate the pain	Prevent overgrazing Avoid pastures where plant occurs
FOOT-AND-MOUTH DISEASE Acute viral disease which spreads rapidly in a herd	 Often these animals limp because of inflammation between the hooves  Blisters or sores in the mouth and on the tongue High morbidity – low mortality	 Veterinarian or laboratory	 No treatment	 Report to Veterinary Services immediately  Vaccination done only by Veterinary Services in certain areas

Possible cause	Other signs	Diagnosis	Treatment	Prevention
CONTAGIOUS BOVINE PLEURO-PNEUMONIA (LUNG SICKNESS) Some animals develop swollen joints and have difficulty to walk 	Main symptom is coughing High morbidity – high mortality in unvaccinated livestock	 Veterinarian or laboratory	 No treatment	 Report to Veterinary Services immediately  Vaccination done only by Veterinary Services in certain areas

5. SUDDEN DEATH



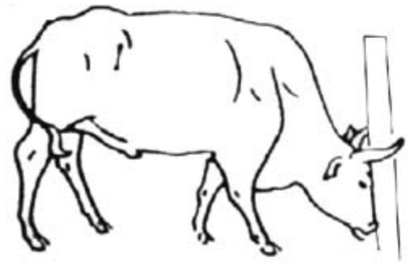


Possible cause	Other signs	Diagnosis	Treatment	Prevention
ANTHRAX Acute bacterial disease	Blood oozing from the nose, mouth and anus of the dead animal  **DO NOT OPEN SUCH A CARCASS!** Low to high morbidity – high mortality	 Veterinarian or laboratory	 No treatment	 Report to Veterinary Services immediately  Vaccination  Dangerous for people  After contact with the disease seek medical help

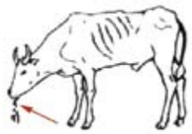
Possible cause	Other signs	Diagnosis	Treatment	Prevention
PLANT POISONING  Poison onion  Cape poison onion  Cape hyacinth  Milkweed  Gousiekte tree  Gifblaar  Slangkop	These plants usually grow early before the rainy season and cattle eat them because it is the first green plant material available Animals usually die acutely after they had water to drink	Presence of the plants in the pasture Acute death at water Plant material in rumen	 Treatment usually ineffective Can try PPR or activated charcoal	Avoid pastures where these plants occur It helps to keep animals away from water after they return from grazing until the next morning

Possible cause	Other signs	Diagnosis	Treatment	Prevention
BLACK-QUARTER Acute disease caused by the bacillus *Clostridium chauvoei* 	Usually affects animals from 6 months–3 years of age One often sees swelling of a hind leg or front leg with the meat appearing rotten and gas bubbles under the skin Low to high morbidity – high mortality in unvaccinated livestock	 Veterinarian or laboratory	 No treatment usually effective as the animal dies too quickly	 Vaccination
SNAKEBITE  A number of poisonous snakes can cause fatal bites to livestock	Often swelling is observed at the bite site	Circumstantial evidence Bleeding under the skin at the bite site	 No treatment	None
RIFT VALLEY FEVER Acute insect transmitted viral disease Causes acute deaths in young calves and lambs	Also causes severe outbreaks of abortions Usually after a very good rainy season Transmitted by mosquitoes	 Veterinarian or laboratory	 No treatment	 Report to Veterinary Services immediately  Vaccination  Dangerous for people

6. ABNORMAL BEHAVIOUR



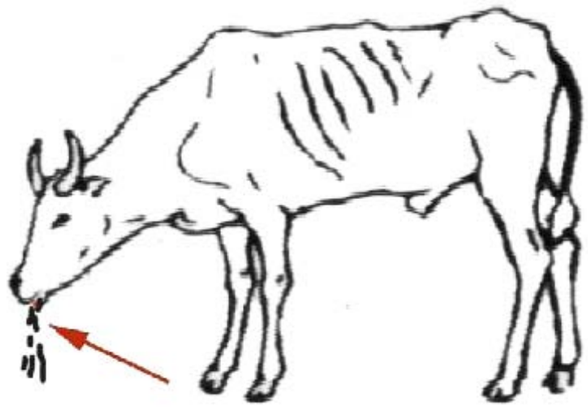
Abnormal behaviour may be head pressing, aggression or stupor.

Possible cause	Other signs	Diagnosis	Treatment	Prevention
RABIES Invariably fatal disease of warm-blooded animals Infection occurs from a bite by an infected animal	 Abnormal behaviour like bellowing Some animals may become very aggressive and chase people  Many rabid animals show salivation	 Veterinarian or laboratory Diagnosis made on brain tissue of the dead animal	 No treatment	 Report to Veterinary Services immediately  Vaccination  Dangerous for people  After contact with the disease seek medical help

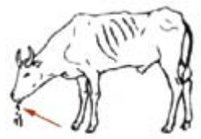
Possible cause	Other signs	Diagnosis	Treatment	Prevention
LEAD POISONING The nervous system of the animal is affected by lead poisoning	Access to old car batteries or paint tins Animals may appear blind Constipation and dark faeces is a common symptom Animals may be aggressive	Rumen content dark and smelly – often find remnants of batteries in rumen  Veterinarian or laboratory	 No treatment	Do not litter Do not allow cattle access to refuse dumps
BOTULISM This is a poisoning by poisons produced by bacteria growing in organic material like bones Animals get sick if they eat bones because of a phosphate deficiency	 The animals often salivate because they cannot swallow due to paralysis of the jaw and oesophagus  The animal lies down and cannot get up  Often they try to get up, but cannot because of paralysis of the legs  Sometimes the tongue is paralysed and hangs out	Circumstantial evidence of consuming bones when no lick is available Sometimes bones are found in the rumen of dead animals at postmortem examination	 No treatment	 Vaccination  Feed lick

Possible cause	Other signs	Diagnosis	Treatment	Prevention
PLANT POISONING  Red bessie  Malkop ui  Ombakapuke	Staggers as if they are drunk Usually sudden death, but may see head pushing and staggering Krimpsiekte Bloat, weakness and paralysis as with botulism	Circumstantial evidence of ingesting the plants	 No treatment	Avoid pastures with these plants
UREA POISONING Ingestion of urea often causes frantic staggering and bellowing	Often bloat and difficulty to breathe Abdominal pain Sudden death may also occur	Circumstantial evidence of ingestion of urea together with symptoms	Vinegar and water by mouth	Avoid urea lick in rainy season or cover lick troughs Prevent animal access to fertilisers and feed stores

7. SALIVATION



Salivation may be seen as a result of more saliva being produced or the animal's inability to swallow.

Possible cause	Other signs	Diagnosis	Treatment	Prevention
RABIES Invariably fatal disease of warm-blooded animals Infection occurs from a bite by an infected animal	 Many rabid animals show salivation  Abnormal behaviour like bellowing Some animals may become very aggressive and chase people	 Veterinarian or laboratory Diagnosis made on brain tissue of the dead animal	 No treatment	 Report to Veterinary Services immediately  Vaccination  Dangerous for people  After contact with the disease seek medical help

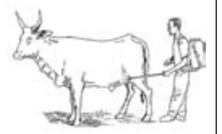
Possible cause	Other signs	Diagnosis	Treatment	Prevention
FOOT-AND-MOUTH DISEASE Acute viral disease which spreads rapidly in a herd  Salivate as result of inflammation of the mouth	 Blisters or sores in the mouth and on the tongue  Often these animals limp because of inflammation between the hooves High morbidity – low mortality	 Veterinarian or laboratory	 No treatment	 Report to Veterinary Services immediately  Vaccination only by Veterinary Services in certain areas
BOTULISM This is a poisoning by poisons produced by bacteria growing in organic material like bones Animals get sick if they eat bones because of a phosphate deficiency  The animals often salivate because they cannot swallow due to paralysis of the jaw and oesophagus	 The animal lies down and cannot get up  Often they try to get up, but cannot because of paralysis of the legs  Sometimes the tongue is paralysed and hangs out	Circumstantial evidence of consuming bones when no lick is available Sometimes bones are found in the rumen of dead animals at postmortem examination	 No treatment	 Vaccination  Feed lick

Possible cause	Other signs	Diagnosis	Treatment	Prevention
PLANT POISONING  Thorn apple	Also causes severe diarrhoea, cramps and paralysis	Circumstantial evidence of consuming these plants	 No treatment	Avoid access to these plants
SWEATING SICKNESS A tick-transmitted disease of particularly young calves Salivation occurs	 Causes mainly inflammation of the skin that looks as if the animal is sweating	Presence of *Hyalomma* (Bontpoot) ticks especially at the tip of the tail	 Tetracycline drugs	 Tick control
BOVINE MALIGNANT CATARRH (*SNOTSIEKTE*) A severe disease caused by a virus Occurs where wildebeest come into contact with livestock	 Inflammation and reddening of the eye  Nasal discharge  Severe inflammation of the mouth Low morbidity – high mortality	 Veterinarian or laboratory	 No treatment	 Report to Veterinary Services immediately

8. WEAKNESS

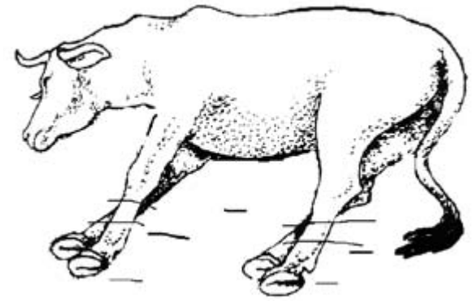
Many diseases of cattle have weakness as one of the signs of the disease.

A number of diseases have weakness as the most important sign without other easily noticeable changes.

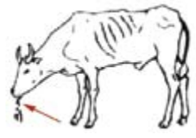
Possible cause	Other signs	Diagnosis	Treatment	Prevention
ANA-PLASMOSIS (GALL SICKNESS) This is a tick-transmitted disease causing the blood cells to break down	 The eye of the animal is pale Usually the faeces is dry and resembles pellets like antelope dung There is rapid, shallow breathing The muzzle of the animal is dry and scaly The animal has a fever	 Veterinarian or laboratory	 Inject long-acting oxy-tetracycline antibiotic Give good green feed to get the rumen working	 Tick control

Possible cause	Other signs	Diagnosis	Treatment	Prevention
BABESIOSIS (REDWATER) This is a tick-transmitted disease causing high fever and blood cells to break down	 The eye of the animal is pale with a yellow tinge Usually the urine has a reddish-brown colour There is rapid, shallow breathing The muzzle of the animal is dry and scaly The animal has a fever	 Veterinarian or laboratory	 Inject BERENIL	 Tick control
PLANT POISONING  Ombakapuke	Also shows bloat, trembling and severe diarrhoea	Circumstantial evidence	 No treatment	Prevent overgrazing
MILK FEVER This is a non-contagious illness caused by a lack of calcium in the blood and occurs direct after giving birth	Usually very rapid heartbeat that one can hear on the outside After calving the cow lies on its chest with the head to the side	Circumstantial evidence	 CALCIUM-BOROGLU-CONATE E or CALCITAD injection	Balanced diet  Feed lick

9. PARALYSIS



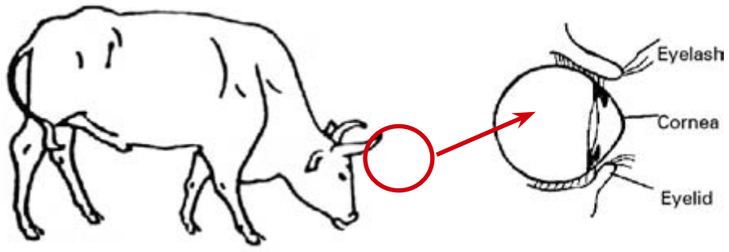
The animal is usually alert but has no strength to get up.

Possible cause	Other signs	Diagnosis	Treatment	Prevention
RABIES Invariably fatal disease of warm-blooded animals Infection occurs from a bite by an infected animal	 Abnormal behaviour like bellowing Some animals may become very aggressive and chase people  Many rabid animals show salivation	 Veterinarian or laboratory	 No treatment	 Report to Veterinary Services immediately  Vaccination  Dangerous for people  After contact with the disease seek medical help

Possible cause	Other signs	Diagnosis	Treatment	Prevention
BOTULISM This is a poisoning by poisons produced by bacteria growing in organic material like bones Animals get sick if they eat bones because of a phosphate deficiency  The animal lies down and cannot get up  Often they try to get up, but cannot because of paralysis of the legs	 The animals often salivate because they cannot swallow due to paralysis of the jaw and oesophagus  Sometimes the tongue is paralysed and hangs out	Circumstantial evidence of consuming bones when no lick is available Sometimes bones are found in the rumen of dead animals on postmortem examination	 No treatment	 Vaccination  Feed lick

Possible cause	Other signs	Diagnosis	Treatment	Prevention
LEAD POISONING Paralysis may be associated with lead poisoning because the nervous system of the animal is affected by lead poisoning	Access to old car batteries or paint tins Animals can appear to be blind No visible eye lesions or abnormalities is seen in the eye Constipation and dark feaces are common symptoms Animals may be aggressive	Rumen content dark and smelly – often find remnants of batteries in rumen  Veterinarian or laboratory	 No treatment	Do not litter Do not allow cattle access to refuse dumps
PLANT POISONING  Ombakapuke	Also shows bloat, trembling and extreme weakness	Circumstantial evidence	 No treatment	Prevent overgrazing

10. BLINDNESS AND EYE LESIONS

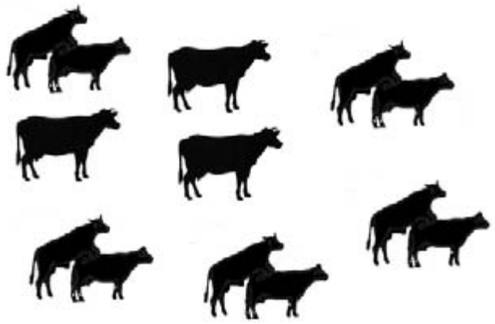


Blindness in animals can be caused by visible lesions in the eye or by disease of the nervous system while the eye appears normal.

Possible cause	Other signs	Diagnosis	Treatment	Prevention
LEAD POISONING The nervous system of the animal is affected by lead poisoning which may cause the animal to appear to be blind	Access to old car batteries or paint tins No visible eye lesions or abnormalities is seen in the eye Constipation and dark feaces are common symptoms Animals may be aggressive	Rumen content dark and smelly – often find remnants of batteries in rumen Veterinarian or laboratory	No treatment	Do not litter Do not allow cattle access to refuse dumps
INFECTIOUS OPTHALMIA Blindness due to severe eye lesions	Inflamaton of the eyeball (ranging in severity) 	Veterinarian or laboratory	Treatment with antibiotic eye powder or eye ointment 	Fly control Vaccination Prevent overcrowding in kraals

Possible cause	Other signs	Diagnosis	Treatment	Prevention
DRUG OVERDOSE Some worm remedies cause damage to the brain and eye if the animal is given too much of the medicine	No eye lesions observed History of recent deworming	Circumstantial evidence Veterinarian or laboratory	No treatment	Give all drugs and remedies strictly according to prescription
VITAMIN A DEFICIENCY Severe deficiency of vitamin A can cause abnormalities in very young animals so that the eyes and brain do not develop properly	No eye lesions observed	Circumstantial evidence Veterinarian or laboratory	No treatment	Vitamin A injection
BOVINE VIRAL DIARRHOEA Infection of the cow while she is pregnant may lead to brain abnormalities in the calf, which is then born blind	Often associated with high incidence of abortions in the cow herd Also other abnormalities in calves observed	Veterinarian or laboratory	No treatment	Vaccination

11. LOW CALVING RATES

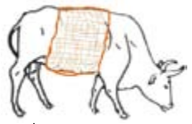


The bulls are observed repeatedly serving the same cows.

A large proportion of the cows do not calf.

The heat interval of cows varies – generally longer than the normal 21 days.

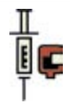
Possible cause	Other signs	Diagnosis	Treatment	Prevention
TRICHO-MONIASIS A venereal disease transmitted by mating	Cows show irregular heat cycle Cows often have vaginal discharge Abortions may be observed in the cow herd	 Veterinarian or laboratory	 No treatment	Test bulls for the disease before the breeding season Do not use infected bulls
CAMPYLO-BACTERIOSIS A venereal disease transmitted by mating	Cows show irregular heat cycle Cows often have vaginal discharge Abortions may be observed in the cow herd	 Veterinarian or laboratory	 Vaccination of affected animals increases the body's resistance to the infection so that the animal is cured	Test bulls for the disease before the breeding season  Vaccination
BOVINE VIRAL DIARRHOEA If infected at a very early stage of pregnancy the foetus may die off and get resorbed	Cows show irregular heat cycle Abortions occur and abnormal calves are born	 Veterinarian or laboratory	 No treatment	 Vaccination

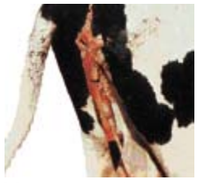
Possible cause	Other signs	Diagnosis	Treatment	Prevention
MAL-NUTRITION Cows in poor body condition do not easily conceive	Cows do not come on heat because of poor condition 	Poor condition of animals during the breeding season	 No treatment	 Feed lick Prevent overgrazing
BULL INFERTILITY	 Bulls may be infertile or have an infection of the genital organs	 Veterinarian or laboratory	 No treatment	Have bulls checked by a veterinarian Only use fertile bulls
BULL INJURY The bull may have broken his penis, or developed an infection and prolapse of the foreskin, or a heavy tick infestation of the foreskin	 Swelling or abnormal shape of the penis or foreskin	By visual inspection	 Place a sack bandage around the bull to push the penis tightly against the body to reduce swelling  Inject long-acting anti-biotics In severe cases surgical treatment by a veterinarian	Do not use virgin bulls on heifers – they are prone to inexperience Do not use bulls with a very long pendulous sheath (foreskin)  Tick control

12. ABORTIONS

An abortion is the expelling of a dead, under-age calf.

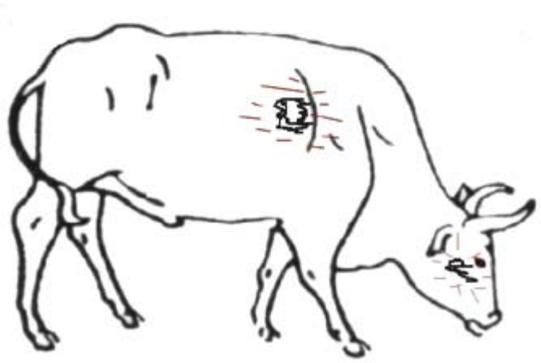
Possible cause	Other signs	Diagnosis	Treatment	Prevention
BRUCELLOSIS This is a bacterial disease transmitted by contact (direct and indirect) from one animal to another Abortions often occur in outbreak form 	 Many cows have retained placenta There may be a high incidence of animals with swollen joints	 Veterinarian or laboratory	 No treatment	 Report to Veterinary Services immediately  Compulsory vaccination of heifers under 9 months of age  After contact with the disease seek medical help
BOVINE VIRAL DIARRHOEA If infected at a later stage of pregnancy the foetus may die and be aborted	Cows show irregular heat cycle Abortions occur and abnormal calves are born	 Veterinarian or laboratory	 No treatment	 Vaccination

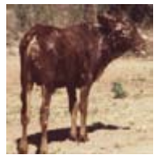
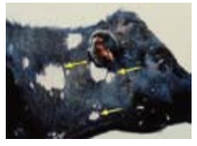
Possible cause	Other signs	Diagnosis	Treatment	Prevention
INFECTIOUS BOVINE RHINO-TRACHEITIS	Sometimes nasal discharge and cough seen in young animals	 Veterinarian or laboratory	 No treatment	 Vaccination
TRICHO-MONIASIS	Poor conception	 Veterinarian or laboratory	 No treatment	Test bulls for the disease before breeding Do not use infected bulls
CAMPYLO-BACTERIOSIS A venereal disease transmitted by mating	Cows show irregular heat cycle Cows often have vaginal discharge	 Veterinarian or laboratory	 Vaccination of affected animals increases the body's resistance to the infection so that the animal is cured	Test bulls for the disease before the breeding season  Vaccination
CHLAMY-DIOSIS (ENZOOTIC ABORTION) Causes sporadic abortions or abortion storms	Often associated with eye infections In small stock also weak lambs or lamb deaths	 Veterinarian or laboratory	 Vaccination to stop abortion storm Tetracycline antibiotics	 Vaccination

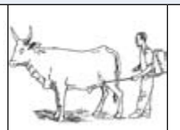
Possible cause	Other signs	Diagnosis	Treatment	Prevention
RIFT VALLEY FEVER An acute viral infection transmitted by mosquitoes Severe abortion particularly after a good rainy season	Also find sudden death in calves When the carcass is opened it appears very bloody and the liver is badly damaged	 Veterinarian or laboratory	 No treatment	 Report to Veterinary Services immediately  Vaccination  Dangerous for people  After contact with the disease seek medical help
MAL-NUTRITION Severe food shortage can cause a cow to abort	 Low conception rate	Circumstantial evidence	 No treatment	 Feed production lick and supplement roughage if necessary
VITAMIN A DEFICIENCY In the dry season a vitamin A deficiency can lead to the cow losing her calf	 Many cows have retained placenta	Circumstantial evidence	 No treatment	 Vitamin A injection

Possible cause	Other signs	Diagnosis	Treatment	Prevention
ANY FEVER Any disease-causing fever can cause abortion in a pregnant cow	Examples are gallsickness, redwater and pasteurellosis	Circumstantial evidence	Depending on the cause of the fever, some long-acting antibiotics can help	Depending on the cause:  Vaccination  Tick control

13. SKIN LESIONS



Possible cause	Other signs	Diagnosis	Treatment	Prevention
PAPILLO-MATOSIS  Irregular wart-like growths usually on young animals	May spread throughout herd	 Veterinarian or laboratory	The warts often regress after some time Some warts can be squashed and cut off and the others regress with time	Vaccination by autogenous vaccine Separate affected animals from rest of the herd
RINGWORM  A fungal infection of the skin spread by direct and indirect contact 	 Irregular bald, dry and scaly patches Can spread rapidly through the herd	 Veterinarian or laboratory	 Spray with ringworm remedy KAPTAN or Iodine spray	 Prevent overcrowding in kraals Separate affected animals from rest of the herd

Possible cause	Other signs	Diagnosis	Treatment	Prevention
SWEATING SICKNESS   Caused by a poison from certain ticks	Often see salivation of affected animal  Presence of Hyalomma tick (bontpoot) particularly at tail tip 	Circumstantial evidence	 Treat with a remedy against ticks  Inject long-acting antibiotic (Oxy-tetracycline) Put the animal in the shade	 Do regular external parasite control
PLANT POISONING  Lantana camara The animal gets sunburnt very easily and there is blistering or scaling of particularly the unpigmented areas of the skin	Eating this plant damages the animal's liver The eyes of the animal become yellow	 Veterinarian or laboratory Circumstantial evidence	Put the animal in the shade Do not give green fresh feed but rather dry hay to eat  Severe cases should be treated by a veterinarian	Avoid pastures containing these plants Do not plant these bushes at homesteads They are a declared weed

Possible cause	Other signs	Diagnosis	Treatment	Prevention
LUMPY SKIN DISEASE  A severe viral disease transmitted by biting insects	The air pipe may be affected causing difficult breathing and coughing	 Veterinarian or laboratory	 Inject long-acting antibiotic (Oxy-tetracycline) to prevent the nodules becoming infected	 Fly control  Vaccination  Report to Veterinary Services immediately
SKIN MITES  In severe cases there is hair loss and crusting of the skin	 The condition often causes a severe itch and the animals scratch themselves	 Veterinarian or laboratory	 Treat with external parasite remedies or avermectin injection	 Prevent overcrowding in kraals

Possible cause	Other signs	Diagnosis	Treatment	Prevention
FOOT-AND-MOUTH DISEASE Acute viral disease which spreads rapidly in a herd   Lesions often on udder skin	 Often these animals limp because of inflammation between the hooves  Blisters or sores in the mouth and on the tongue High morbidity – low mortality	 Veterinarian or laboratory	 No treatment	 Report to Veterinary Services immediately  Vaccination only by Veterinary Services

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