

LIVESTOCK HANDLER TRAINING MANUALS

MODULE 3: SEASONAL PLANNING

Black quarter and pulpy kidney



Infectious diseases that can only be effectively managed through preventative vaccination.

**ANIMAL HEALTH IS
IN OUR DNA**

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Developed by Dr Danie Odendaal

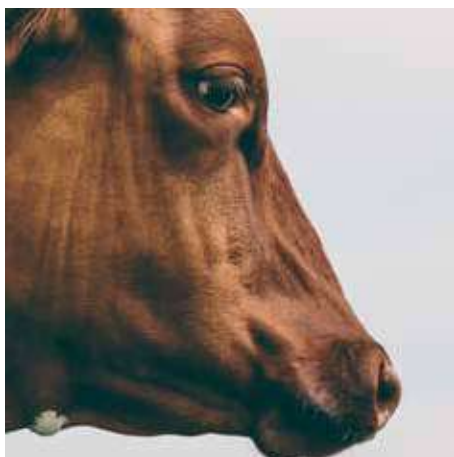
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INTRODUCTION

This manual forms part of Afrivet's series on primary animal health care (PAHC) for small stock and has been developed to help the veterinarian, animal health technician, livestock owner and livestock handler to understand the methodology used when implementing PAHC and production management.

These manuals are ideally suited as practical training aids for training livestock handlers in the principles of planned production management, disease prevention and early disease identification.

The information contained in this manual is a summary of the material used by Afrivet Training Services for the formal training of animal health technicians, extension officers, livestock farmers and livestock handlers.

Developed by Dr Danie Odendaal

Limitations in early disease identification and treatment

While daily observation and the early treatment of the first signs of disease in livestock using Afrivet's structured approach forms the cornerstone of PAHC, there is a limitation to this approach.

The limitation is that it does not manage several common deadly diseases which can occur on any farm but for which no effective treatment exists. Either because the disease causes death too quickly for treatment or there is no treatment available.

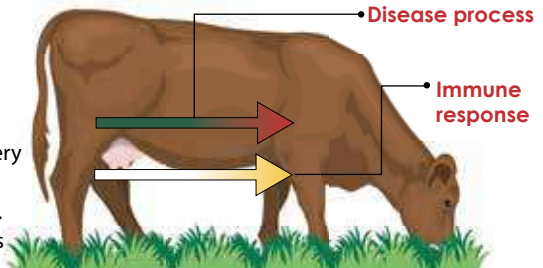
If these diseases are not controlled by vaccination, they limit the effectiveness of the early disease identification and treatment approach and will result in lost production.

The livestock handler needs to know the common diseases that cannot be treated and how best to prevent them.

Treatment versus prevention

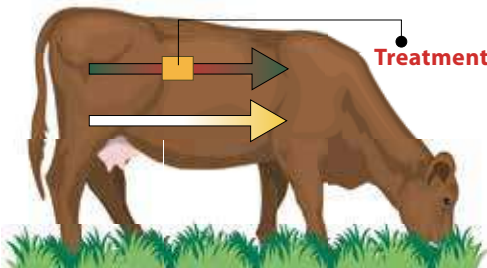
The development of disease with no treatment or preventative vaccination

If an animal gets infected by germs that cause sudden death, the disease will develop over a few days. If the signs of disease are not observed and the correct treatment actioned, the animal will get very sick and die before the body can develop resistance (immunity) against the disease. In this instance the immune response was too slow to respond to the disease.



The development of disease with treatment

If the first signs of disease are observed and through closer examination the right disease identified and correctly treated with an antibiotic, the animal will be cured by the treatment without any loss of production. Even after successful treatment, the animal can still get the disease again. Some diseases can be managed in this way, such as the pneumonia example discussed in Module 1.



With prevention through vaccination

If an animal, vaccinated against a disease, gets infected by the same germs that cause death, the body's own defence system will be ready to identify and destroy the germs before they can cause damage. The animal will not show any signs of disease nor production loss as the immune response is much quicker as a result of the vaccination. Vaccination cannot cure an animal that already has the disease. Diseases that occur frequently on a farm must be prevented in this way.

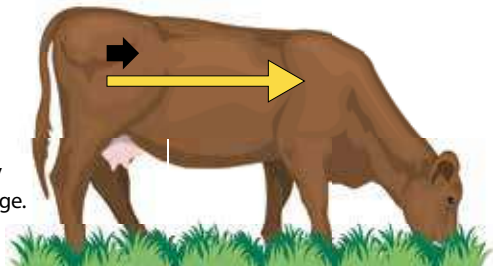


Illustration of disease development process

Illustration of the development or level of disease resistance over time

Diseases and production losses can be triggered by five main causes

Injury



Injuries, such as a broken leg, are difficult to treat and must be prevented through proper animal handling and maintenance of handling facilities.

Poisoning



Poisonings are difficult to treat because of the fast disease process and lack of effective treatments. They must be prevented by knowing the plants and other substances that cause poisoning and preventing the animals from eating these, through proper management.

Infection



Bacterial diseases such as black quarter and pulpy kidney, which develop very fast, and viral diseases such as lumpy skin disease and blue tongue, for which there are no treatments, need to be prevented through vaccination.

Parasites



Multi-host ticks that feed on the udder/testicles, form wounds that can form an abscess which is then very difficult to treat and the damage is done.

Nutrition



Overeating grains in unadapted animals causes high acid levels in the stomach, which will either kill the animal or cause long-term damage too quickly for treatment.



Prevention of diseases centres on an understanding of the disease process. That is why it forms the core of the PAHC approach.

In many cases, early identification and treatment of a disease (pneumonia as an example) will solve the problem, but there are common diseases that develop so fast that there is no time to treat the animal or there is no treatment available that is effective against the disease.

In this module we use black quarter in cattle and pulpy kidney in sheep to explain the problem.

Frequently asked questions – black quarter and pulpy kidney

Q: Where do these diseases occur?

A: These diseases, caused by clostridial bacteria, can occur on any farm in South Africa, at any time of year.

Q: Is it easy to identify the disease?

A: It is very difficult to see any sign of disease before the animal has died. It is also difficult to identify the disease in dead animals and therefore the veterinarian must be called to do an examination of an animal that has died suddenly.

Q: How many animals normally become affected?

A: They are diseases that can affect many animals in a short time.

Q: Can sick animals be treated?

A: If the animal has died because of black quarter the veterinarian can prescribe an antibiotic for the rest of the herd to prevent further deaths. In the case of pulpy kidney, there are no treatment options that effectively stop further deaths other than a change in nutrition management.

Q: Can black quarter and pulpy kidney be prevented?

A: Prevention of these diseases by vaccination and regular booster vaccinations is the only reliable way to stop these diseases from causing severe losses at some point on all farms.

Q: Which factors increase the chance for the development of pulpy kidney?

A: Any major change in the availability of food can cause the start of a disease outbreak. Before these changes occur, a booster vaccination must be given.

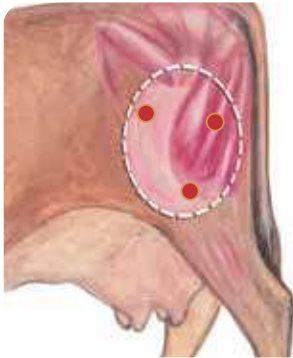
Q: Which factors increase the chance for the development of black quarter?

A: The germs (clostridium bacteria) that cause this disease, survive for a long time in the soil. Severe rainstorms can cause soil erosion that exposes germs in the soil. This can increase the exposure of animals to these kidney, there an outbreak but they occur in low levels in the soil even without disturbance of the soil.

Black quarter in cattle – the

Low-grade infection

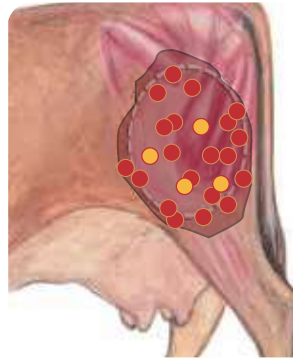
No signs of disease can be observed and the animal will look healthy and eat and produce normally.



● = Bacteria

One to two days after bruising

There are no clearly visible first signs of disease, other than lameness and swelling of one leg if the cattle are continuously observed.



● = Poison

First signs of disease

Development of black quarter

Normally there is no chance for treatment

The bacteria that cause black quarter enter the body through small wounds. These **germs will migrate to the large muscles and will remain (resting)** there without multiplying or causing damage. These germs will start to multiply only when these muscles are bruised.

Muscles are bruised, for example when animals are beaten or handled roughly in a badly constructed crush pen. This causes internal **bleeding and the accumulation of dead blood** forms the right condition for the **germs to start multiplying fast** and produce a **dangerous poison (toxin)** in the muscles.

This part of the disease process is not easily visible.

disease development process

Three to four days after bruising

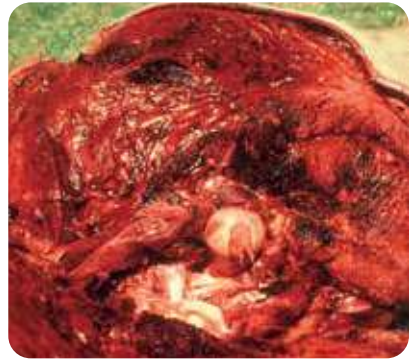
Sudden death of animals – mostly calves or young cattle but adult cattle can also die.



Photo's: University of Pretoria

Examination of dead cattle

When a veterinarian cuts the dead cattle open he/she will look for typical signs of the disease in the muscles, under the skin and in other



Poison that forms in the muscles will kill cattle

This poison is now taken up into the bloodstream and circulated throughout the body. This poison causes immediate and severe damage to all the vital organs in the body including the kidneys, heart, lungs and brain.

The veterinarian will take some samples to confirm the cause of the disease (diagnosis).



This part of the disease process is now easily visible.



Pulpy kidney in sheep – the

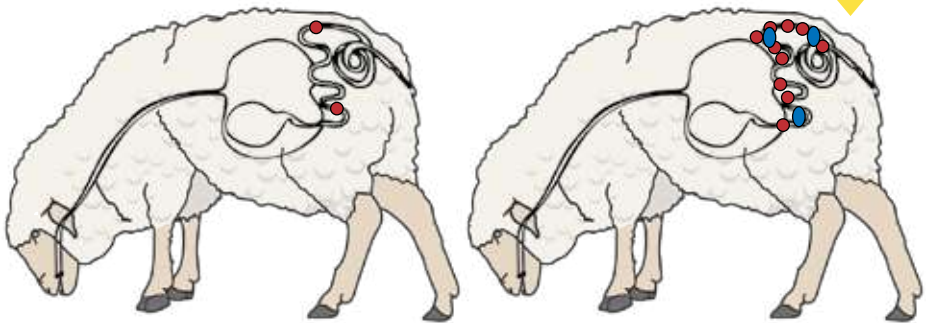
Low-grade infection

No signs of disease can be observed and the animal will look healthy and will eat and produce normally.

One to two days after change in the availability of food

There are no clearly visible first signs of disease, except for minor changes in behaviour if the sheep are continuously observed.

First signs of disease



● = Pulpy kidney bacteria

● = Poison, produced by bacteria

Development of pulpy kidney

Normally there is no chance for treatment

The bacteria that cause pulpy kidney occur normally in the intestines of sheep. These germs are present in low numbers because they multiply at a slow rate when the animals are grazing on veld. Very little free food is available that can be used for multiplication by these germs.

With a sudden increase in the availability of free food in the intestines when sheep are:

- Given a lick
- Moved to new lush pasture
- Dewormed

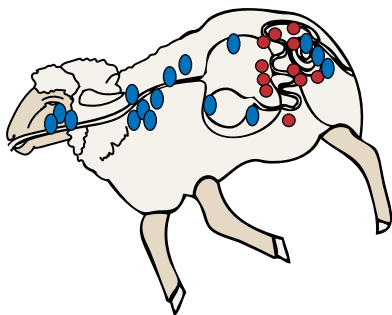
Because of the sudden availability of food the **germs start to multiply fast** and **produce a dangerous poison (toxin) in the intestine.**

This part of the disease process is not easily visible.

disease development process

Three to four days later

Sudden death, mostly of lambs and young sheep but adult sheep can also die.



● = Poison, circulated through the body

Examination of a dead sheep

When a veterinarian cuts the dead sheep open he/she will look for signs of the disease in the kidneys and other organs.



Poison that forms in the intestine which kill sheep

This **poison is now taken up through the intestinal wall into the blood and circulated throughout the body.** This poison causes immediate and severe damage to all the vital organs in the body including the kidneys, heart, lungs and brain.

Because the signs of the disease in the dead sheep are not always clear, the veterinarian will take some tissue samples to confirm the cause of the disease (diagnosis). In order to do this successfully, the dead sheep must still be fresh or an effective examination of the dead sheep cannot be done and no cause of death confirmed.

This part of the disease process is now easily visible.



Disease prevention

There are four basic approaches to disease prevention.

1. Increase general resistance

Neither black quarter in cattle nor pulpy kidney in sheep can be prevented by just following good management practices. These two diseases can still affect animals in very good condition. In the case of black quarter, good handling can reduce the chances of bruising.

2. Increase specific resistance

Regular vaccination, which must be done at least once a year, is the the only effective management action that can prevent these diseases. The vaccines against black quarter and pulpy kidney are inactivated vaccines and therefore don't give protection for more than a year. If conditions occur under which the germs causing pulpy kidney can start multiplying faster in the intestines, like when high energy supplements are provided during the dry season, immunity can be boosted by an extra vaccination.

3. Decrease exposure

The germs (clostridium bacteria) causing black quarter and pulpy kidney occur on most farms and therefore we can't avoid the contact and uptake of these germs by the animals when they graze.

4. Avoid exposure

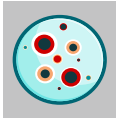
Follow strict biosecurity policy for testing new animals. These diseases must not be introduced onto a farm.

An excellent example would be brucellosis, which can never be allowed to come onto the farm through the application of strict biosecurity controls. This is not an option for the two disease under consideration here, as they already occur on most farms.

The important facts for the livestock handler

- Some diseases can only be prevented by vaccination.
- These vaccinations must be done regularly – at least once a year.
- **If the causes of sudden death are well managed by vaccination, all other animals dying suddenly can be viewed as an emergency for which professional help will be needed.**

How vaccines work



- A vaccine is produced from the same germs that cause the disease in animals. The germs in the vaccine are killed or weakened (inactivated) so that they cannot make the animal very sick.



- After the vaccine is injected, it will activate the animal's defence system, which will fight against the vaccine as if the animal had been infected by the actual germs that cause the disease.



- The development of resistance against these germs happens over time, which is at least two weeks long.



- In the process of developing resistance or immunity, special cells in the blood called white blood cells, are programmed to identify, destroy and remove the invading germs to stop them from causing damage to the body.



- Although the inactivated germs in the vaccine do not cause damage to the body, the animal will still develop resistance or immunity against this specific germ without it affecting the working of the body.



- Whenever the animal is exposed to the same germs in future, the animal's own body will be ready to destroy the invading germs within one day, before they can cause damage to the cells, organs and systems of the body.

The correct use of vaccines

1. Choose the right vaccine

Proper diagnosis of the diseases to be prevented and the correct vaccine is a must.

2. Keep the cold chain

- Most vaccines have to be stored at between 4 and 8°C and **must not be frozen (unless it is specifically a frozen vaccine)**.
- Avoid exposing vaccines to high temperatures and direct sunlight because this will destroy the vaccines. Keep vaccines cold after purchase, during transport and when using the vaccine. This is the greatest challenge for the person using a vaccine.
- Purchase vaccines from a reputable supplier from whom you are sure that the cold chain has been maintained prior to purchase.
- Vaccination, for this reason, should be a planned action. It must always be kept in a properly working fridge or small cool box with some ice in a sealed plastic bag, when being transported.

3. Always read the package insert

- Before use, read the package insert carefully.
- Ensure you're using the vaccine correctly for the age of the animal, that the vaccine is safe for pregnant animals, and whether there are any other precautions to adhere to, such as the dosage and the injection site and method.

Vaccination against pulpy kidney

- All adult animals must be vaccinated at least once a year against pulpy kidney. Under conditions where there is a major change in nutrition available, the vaccination can be repeated every six months. When animals are vaccinated for the first time, the vaccine must be repeated a month later.
- This will prevent the most important cause of sudden death in sheep and will enhance the effectiveness of the early disease identification and treatment approach in sheep flocks.

- Ensure the vaccine is within the expiry date.
- Ensure you understand and repeat at correct interval.

4. Use clean equipment for vaccination

- Clean syringes and needles must be used for vaccination. Reusable needles can be sterilised by boiling them in clean water for 15 minutes.
- Automatic syringes must be properly flushed before and after use with boiling water.
- Syringes and needles used for other purposes cannot be used for vaccination.
- Use the correct size needles for either injecting under the skin or into the muscle. Most vaccinations are given under the skin, using a short needle.
- Use a sterile needle when you draw vaccine from the bottle in order not to introduce germs into the vaccine bottle.
- Replace the vaccine bottle in the cool box when it is not used and after the vaccine is drawn up don't let the syringe lie in the direct sun or in a hot place. Use the vaccine in the syringe immediately or place it back into the cool box until it needs to be used.



Vaccination against black quarter

- All adult animals must be vaccinated at least once a year against black quarter. When animals are vaccinated for the first time the vaccine must be repeated a month later. It is always advisable to use a broad-spectrum clostridial disease vaccine when vaccinating young animals (three months to three years).
- This will prevent the most important cause of sudden death in cattle and will enhance the effectiveness of the early disease identification and treatment approach in cattle herds.





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