

Small-scale dairy farming manual

Volume 5

**Husbandry
Units 10 and 11**

Regional Dairy Development and Training Team

**for Asia and Pacific
Chiangmai, Thailand**

**Regional Office for Asia and the Pacific
Bangkok, Thailand**

**FOOD AND AGRICULTURAL ORGANIZATION OF THE UNITED NATIONS
Rome, 1999**

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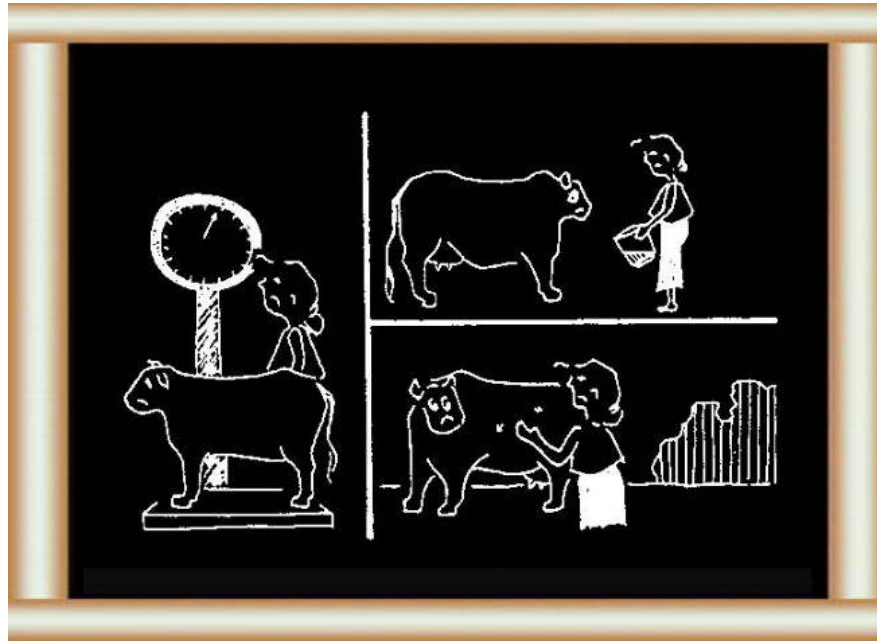
Small-Scale Dairy Farming Manual

Volume 5

Husbandry Unit 10.1

IMPORTANT CONDITIONS/DISEASES AFFECTING DAIRY CATTLE AND BUFFALO

page1



Extension Materials

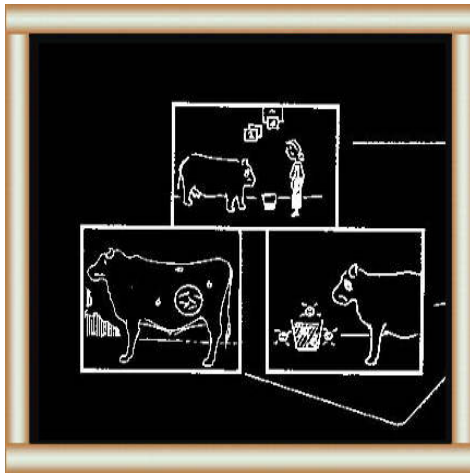
What should you know about diseases of dairy cattle and buffalo?



**What is disease and how does it affect you?
(4-13)**

**1 Disease is a change in your animal which
can cause:**

- lower production
- death
- you to lose money.



What types of disease are there? (14-16)

2 There are diseases caused by:

- micro-organisms
- parasites
- body and feed problems.

What are the more important conditions/diseases? (16-84)

3 There are several important

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conditions/diseases you should know about.

IMPORTANT CONDITIONS/ DISEASES AFFECTING DAIRY CATTLE AND BUFFALO

Husbandry Unit 10.1:

Technical Notes

Note: Numbers in brackets refer to illustrations in the Extension Materials.

Disease is broadly defined as an alteration (or a disturbance) in the structure or function of any organ or part of the body. Diseases reduce the productivity of animals and may even result in their death. Thus there will be losses from the farming enterprise. (4-13)

What is disease?

4 Disease is a change or disturbance in any organ or part of the body.





5 It lowers production and may cause death



6 in people as well as in animals.

It is common to consider diseases based on how they are caused. Infectious diseases caused by micro-organisms (e.g. bacteria and viruses) and parasitic diseases caused by various types of worms and insects receive much attention because of the possible transmission from animals to man, from one animal to another in a herd or even from animals in one herd to those in others. However, diseases resulting from metabolic, anomalous and traumatic conditions also deserve prompt attention to minimise losses.

Some important diseases affecting dairy cattle and buffalo in the region are:

Bacteria: Anthrax, Black Quarter, Brucellosis, Haemorrhagic Septicaemia, Johne's Disease, Mastitis, Tuberculosis

Viral: Foot and Mouth Disease, Rinderpest

Parasitic: These are of several types:

- Ectoparasites e.g. lice, ticks and mites

- Endoparasites e.g. worms in alimentary tract and lungs and protozoan parasites in blood. (15)

Metabolic: Bloat, Ketosis (Acetonaemia), Milk Fever, poisoning (16)

Anomalous: Dystokia, prolapsed uterus/vagina, retained placenta

Traumatic: Various types of external and internal injuries (some of which may become infected with microorganisms or invaded by maggots subsequently)

There are a large number of diseases and conditions that can affect dairy cattle/buffalo. Their incidence and economic importance vary from country to country. Some of the more important ones are discussed below (in alphabetical order).

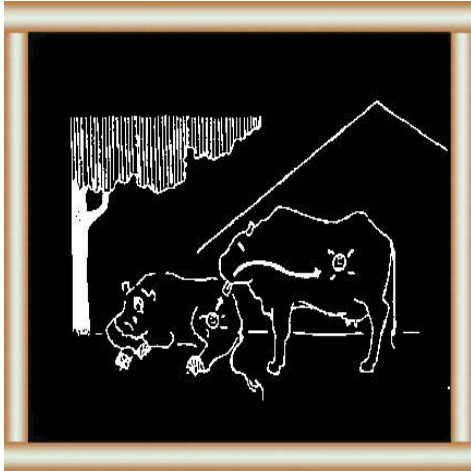
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How can disease make you lose money?

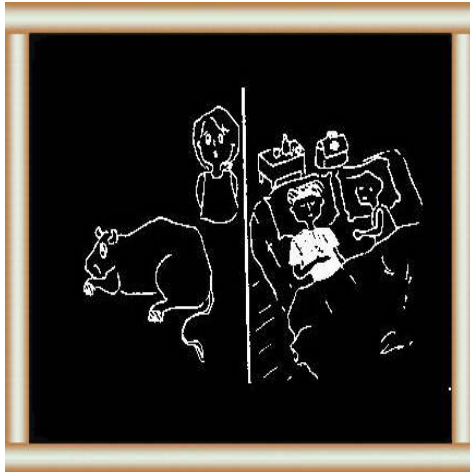
7 While your animal is sick, it has lower:

- weight gain
- milk yield
- reproduction.





8 Your sick animal can pass the disease on to other animals.



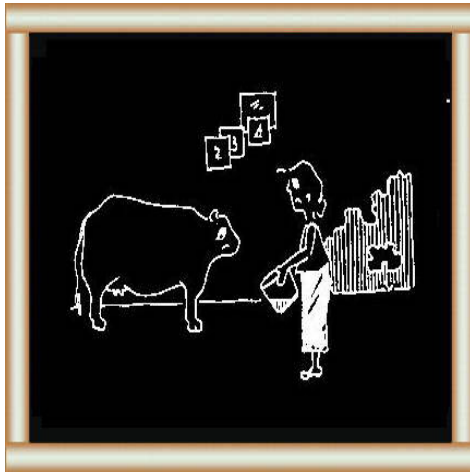
9 You and your family can catch infectious diseases from sick animals and then you cannot work.



10 You must pay for treatment.



11 Your animal may die.



12 If your animal gets better, it may still have lower production.



13 To save money, you must prevent and control disease.

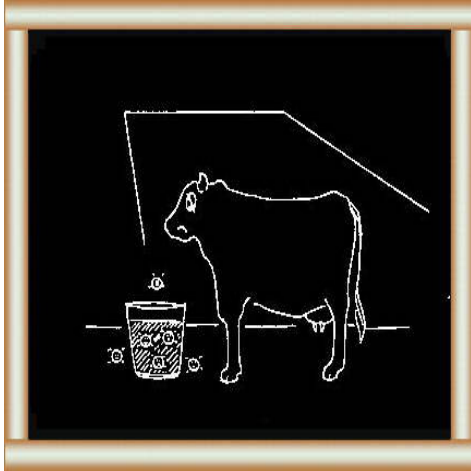
What types of disease are there?

14 There are many types of disease.

Some come from micro-organisms:

- bacteria

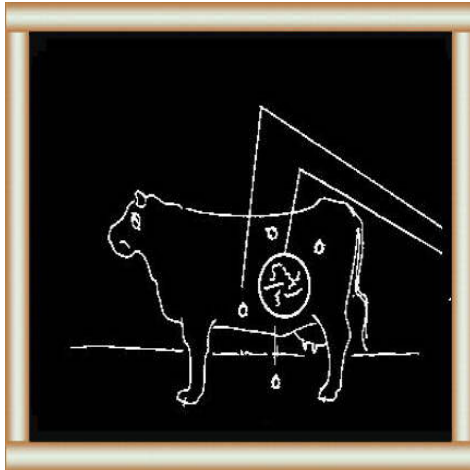
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- virus.

(See H.10.2-H.10.5)



15 Some come from parasites:

- outside

- inside

your animals.

(See H.10.6 Parasites)

**16 Some diseases come from:
- body problems**

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- food problems
- injuries.

Anthrax (17-26)

Anthrax is an acute infectious disease of all warm blooded animals including man. It is caused by a large bacillus called Bacillus anthracis, which is capable of forming spores on exposure to air. The spores can survive for many years in the soil.

The disease is found worldwide, but is more common in tropical countries.

The bacteria can enter the body through a wound or may be inhaled or ingested.

In many cases, an infected cow/buffalo is found dead suddenly, usually with a bloody discharge from the nose and anus, but without any previous signs of illness.

In other cases, the characteristic features are sudden onset, high

fever, difficult breathing, staggering gait, extreme weakness and rapid death.

If an animal dies suddenly without any previous signs of disease (or after showing signs indicated above), anthrax should be suspected. As anthrax is a notifiable disease in many countries, such deaths or suspected cases should be reported to the government veterinarian.

No post mortem examination should be attempted. However, a blood smear should be taken from the ear or tail, as soon as possible after death. All precautions should be taken to prevent contamination of the surroundings. Persons handling this type of animal should wash themselves thoroughly thereafter and boil clothing for about 20 minutes before re-use.

Other precautionary measures to be taken are as follows:

- Carcasses of animals which have died or are suspected to have died of anthrax should be buried at least 1.8 m deep, covered with quick lime and the area fenced off.**
- All infected material, soil and bedding etc should be burnt.**
- All susceptible animals should be kept away from infected areas and vaccinated. Vaccination should be repeated annually at least for three years after the last case.**

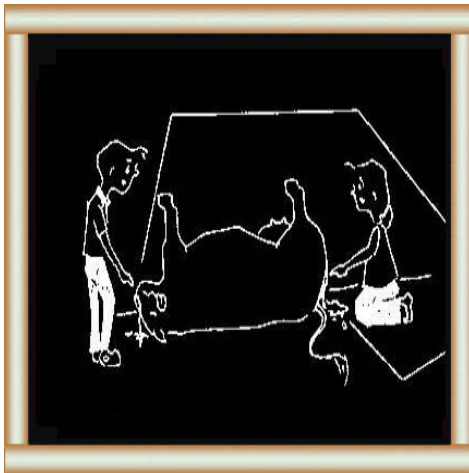
What are the more important diseases?



Anthrax

17 Anthrax is a bacterial disease which attacks all animals including man.

18 Signs of Anthrax include:



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- high fever
- difficulty in breathing
- difficulty in walking
- weakness and quick death.

19 Sometimes there are no signs but your animal dies suddenly with a bloody discharge

from:

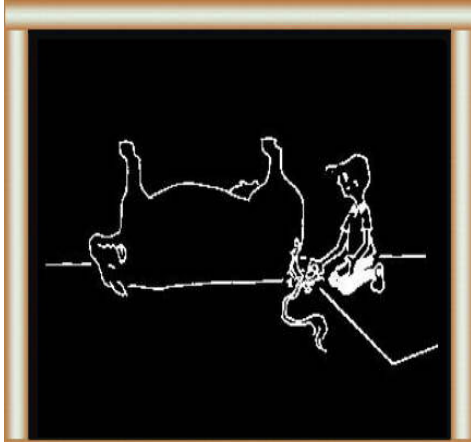
- nose
- anus.



20 Your animals can get Anthrax by contact with the bacteria through:

- a wound
- breathing in dust
- feeding.

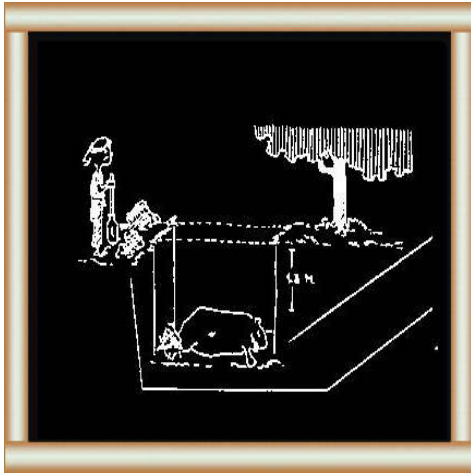
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**21 Call your extension worker or vet as soon as possible.
He will take a blood smear.**

22 Try not to move the dead animal or let anything come into contact with it.



**23 Bury carcasses at least 1.8 m deep.
Cover with quick lime and fence the area off.**

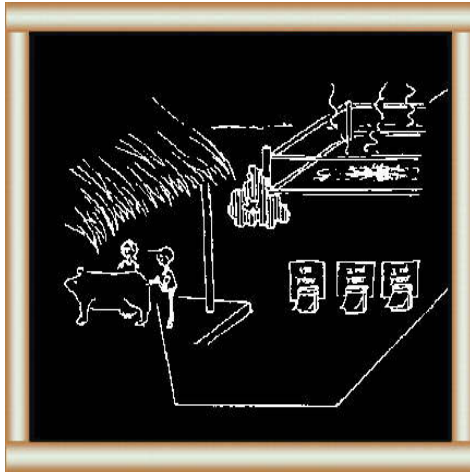


**24 Burn soil, bedding and any materials which
come into contact with the dead animal.**



**25 Wash yourself carefully after any contact.
Boil your clothes for at least 20 minutes
before reuse.**

26 Keep healthy animals away from infected



areas.
Vaccinate all animals once a year for 3 years
after the last case of Anthrax.

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Black-Quarter (also called Black-Leg or Quarter-III) (27-31)

This is an acute infectious disease of cattle, sheep and pigs, caused by a bacillus called *Clostridium chauvoei*. The bacteria are found in the soil and in the gut of normal animals, and may invade the body through a break in the skin or mucous membrane. They produce

spores which are very resistant to heat and survive a long time in the soil.

The disease is widespread in tropical countries and affects mostly the young adult cattle of the age group 8-18 months old.

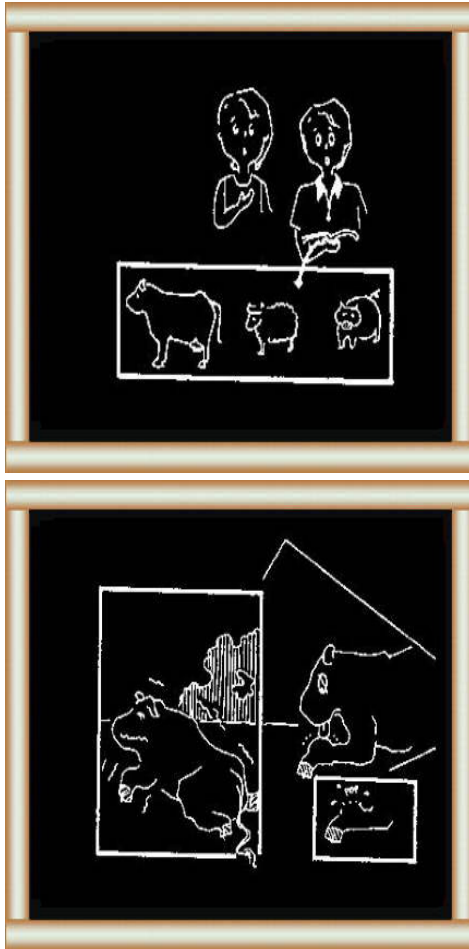
The affected animal is first noticed to be lame. This may be associated with a swelling over the upper part of the leg. The swelling spreads rapidly and crackles on touch, due to accumulation of gas under the skin. Other features are similar to anthrax.

Sometimes an animal may be found dead suddenly, without showing any previous signs.

If black-quarter is suspected, a blood smear from the swelling should be sent immediately for examination, which will be sufficient to differentiate it from anthrax.

In areas where the disease is reported, cattle between 6 months and 3 years of age should be vaccinated annually.

The carcasses of infected or suspected animals should be dealt with as in anthrax.

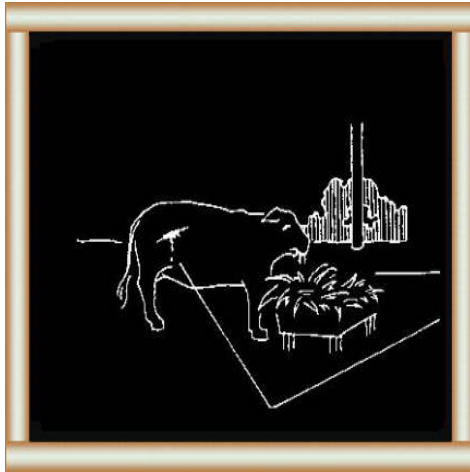


Black-Quarter (Also Black-Leg or Quarter-III)

27 Black-Quarter is a bacterial disease which attacks cattle, sheep and pigs.

28 Signs of Black-Quarter include:

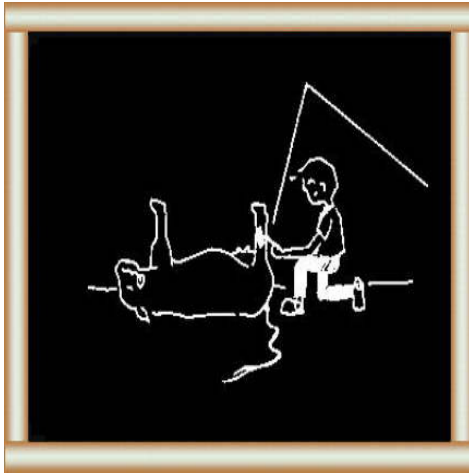
- lameness
- swellings on upper parts of legs which spread and crackle on touch owing to gas under the skin
- other signs similar to Anthrax.



29 Young adult animals, 8-18 months old,
most often get the disease by contact
through:

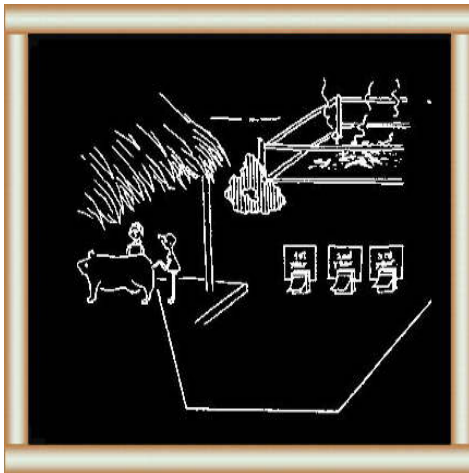
- feed
- wounds on the skin or mucous membranes.

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V2

**30 Call your vet or extension worker.
He will take a blood smear from the swelling
to assist diagnosis.**



**31 Deal with carcasses and infected materials
as for Anthrax (See 23, 24).
In areas with disease, vaccinate animals
between 6 months and three years of age
each year.**

Bloat (32-38)

This is a condition in which the rumen gets distended with gas that accumulates in it. Signs that can be observed include the swelling of the left side of the body between last rib and hip bone, uneasiness shown by stamping of the feet, frequent passing of small quantities of urine and dung, difficult, rapid breathing and slight protrusion of the tongue.

The animal may collapse and die suddenly if relief is not provided.

A handful (about 100 gm) of common laundry detergent powder put into the mouth or about 500 ml of a mineral oil e.g. peanut oil, linseed oil given as a drench, if the animal can swallow, may bring about relief. Sometimes it may become necessary to introduce a stomach tube or in most severe cases, even to introduce a trocar into the rumen through the left paralumbar fossa, which is best done by a vet. In an extreme situation, a farmer may use a sharp, pointed knife to pierce the rumen to prevent death.

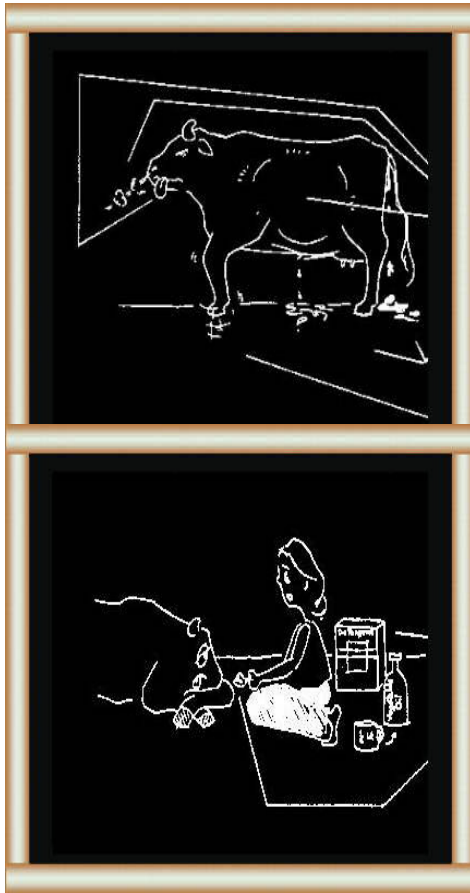
Once bloat has been relieved, the following practices are adopted to prevent its recurrence: walking the animal; standing the animal with the forequarters elevated; and applying a stick across the mouth to allow for the escape of excess gas.



Bloat

32 In bloat, gas makes the rumen expand.

**33 Signs of bloat include:
- tongue slightly out**



V2

- quick breathing
- swelling of left side of body between last rib and hip bone
- frequent passing of small amounts of dung and urine
- stamping of feet.

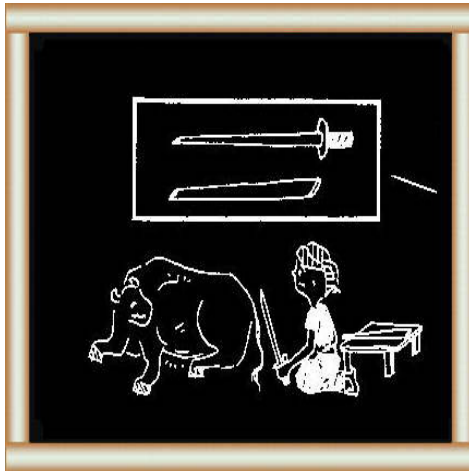
34 You must act quickly or your animal may die.

Put a handful of laundry detergent powder into the animal's mouth or give 500 ml of mineral oil (e.g. peanut or linseed oil) or 100

ml of turpentine to an adult animal as a drench.



35 If your animal cannot swallow, you may have to use a stomach tube.



36 In areas where bloat is common, keep a trocar and cannula ready for use.



37 In an emergency you may have to pierce the rumen with a sharp pointed knife to prevent death.



- 38 After relieving bloat, you can prevent it developing again by:
- walking your animal
 - keeping the front part of your animal higher than the rear
 - putting a stick across the mouth to let gas escape.

Brucellosis

see [H.10.2](#)

"Downer" Cow (39-45)

This refers to a situation in which the cow lies down and does not get up. When she is urged to get up, she may make a feeble attempt but is unable or too depressed to try.

The situation may be a result of one or more of several conditions such as acetoanaemia, milk fever, hypomagnesaemia, infectious and debilitating disease, severe intoxication or even an injury. The first three conditions are mostly observed in high milk producers.

Such a situation necessarily requires treatment by a vet. Certain steps that need to be taken before the arrival of the vet are:

- Tie the animal loosely with a rope which can be cut off easily if there is a danger of the cow being strangled from struggling.**
- Tie the two hind legs together above the fetlock region, leaving a space of about 18 inches between them to prevent the cow spreading her legs apart and damaging her hips.**
- Make the cow comfortable by providing dry bedding and if she is on a cement floor sprinkle some sawdust, sand or grit around the hind**

feet, to make it easier for her to stand without slipping.

A drench of treacle mixed with glucose may be helpful in the case of acetonaemia and can do no harm in other conditions, provided the animal can swallow.

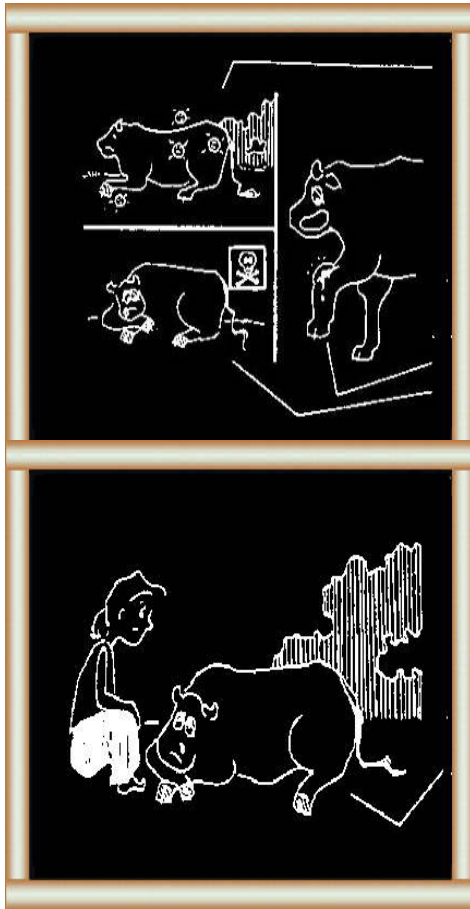
It would be a good practice to collect all possible information such as the following and make it available to the vet on his arrival.

General health of the herd, current production, reproduction status, nutrition, previous sickness and treatment, vaccinations, any peculiarities noticed for the last few days and after the cow went down should also be reported.

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"Downer" Cow

39 "Downer" Cow may result from:
- some conditions which often go along with



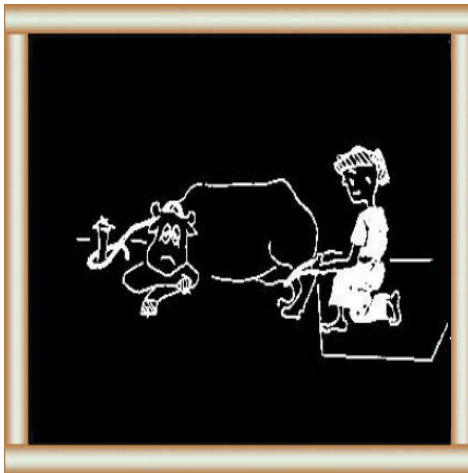
V2

- high milk production
- diseases which weaken animals
- poisoning
- injury.

40 Your animal lies down and does not get up.
She may try, but is too weak or depressed.



41 You must call the vet but while you wait:
- tie your animal loosely with a rope which you can cut off if she struggles and is in danger of strangulating



42
- tie the hind legs together above the fetlocks leaving about 45 cm between them.
This prevents your animal spreading her legs and damaging her hips.



43 Make your animal comfortable with bedding.

If on a cement floor, sprinkle sand, sawdust or grit around hind feet so your animal can stand up without slipping.



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44 If your animal can swallow, give a drench of treacle mixed with glucose.

45 Before the vet arrives, prepare information on:

- health of the herd, previous sickness, treatment and vaccinations
- the present production, reproduction and

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V2

nutrition

- anything unusual you noticed after your animal went down.

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Foot and mouth Disease (FMD)see [H.10.3](#)

Haemorrhagic Septicemia (HS)see [H.10.4](#)

Johne's Disease (46-49)

A chronic infectious disease of cattle and other ruminants caused by a bacillus, *Mycobacterium johneii*. Cattle, sheep and goats are most commonly affected, but the disease is also reported in buffalo.

Infected animals lose condition and show reduced milk yield. A bubbly diarrhoea with a characteristic smell sets in. Diagnosis is difficult. The disease may be confirmed by laboratory examination of faecal specimens or pieces of affected gut wall.

There is no treatment. The best method of control is to slaughter infected animals and their calves.

Other control measures include:

- Strict maintenance of hygiene and proper disposal of infected faeces and bedding.**
- Separate calves from adults in infected herds.**
- Keep infected pastures free from all ruminants for at least one year, preferably plant the pastures to other crops.**



Johne's Disease

46 Johne's Disease is a bacterial disease which attacks cattle, sheep, goats and buffalo.

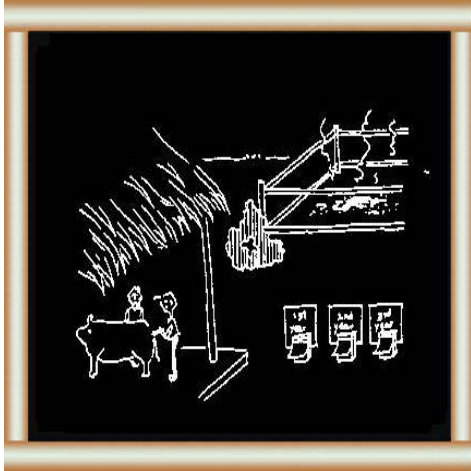
47 Signs of Johne's Disease include:



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- poor condition
- low milk yield
- bubbly diarrhoea with strong smell.

48 Diagnosis is difficult so take a sample of the diarrhoea for your vet to check.



**49 You cannot treat the disease.
Slaughter infected animals and deal with
carcasses and materials as for Anthrax. (See
23, 24)**

**Keep calves separate and animals away from
infected areas for one year.**

Mastitis

see [H.10.5](#)

Parasites

see [H.10.6](#)

Poisoning (50-54)

Poisoning of cattle and buffalo can occur in many ways. They may graze on poisonous plants such as Bracken Fern or on roughage on which weedicides have been sprayed; they may drink kerosene oil or excessive amounts of salt solution by accident; they may be sprayed with or dipped in an insecticide solution with too high a concentration of insecticide; they may be given straw with too high a concentration of urea.

The first-aid measures depend on the cause of the poisoning. A diagnosis has to be made as to whether the symptoms are due to poisoning or any other disease, and if it is poisoning, as to the cause of poisoning.

In most cases of poisoning by vegetable poisons taken by mouth, absorption can be hindered by giving strong (boiled) black tea or coffee. However, the animal may need further vet attention.

Urea poisoning can be suspected if there is a history of urea feeding (especially straw treated with urea just prior to feeding) and

symptoms appear within a few hours. The symptoms are frothing at the mouth, staggering, trembling, gasping and laboured breathing and convulsions in severe cases. Death may result within a few hours after the first symptoms.

A litre of vinegar is a good antidote for urea poisoning, if given when first symptoms appear and the animal is able to swallow.

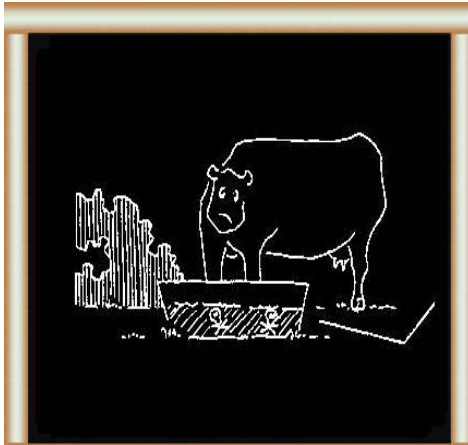
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Poisoning

50 Poisoning may result from feeding on:

- poisonous plants
- roughage sprayed with weedicide
- straw with too much urea



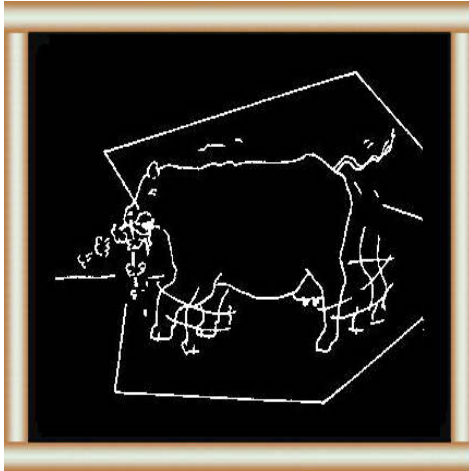
51 or from:

- drinking oil or salt solution by accident
- spraying or dipping in too strong a solution of insecticide.



52 Try to find the cause of poisoning.

For vegetable poisons, slow absorption by giving strong (boiled) black tea or coffee. You may also need to call the vet.

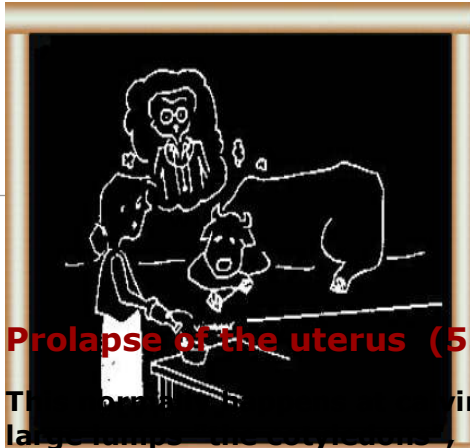


53 If you feed urea and your animal is:

- frothing at the mouth
- trembling and staggering
- gasping with laboured breathing
- convulsions in bad cases

54 your animal may have urea poisoning and may die.

If your animal can swallow, give 1 l of vinegar as soon as symptoms appear.



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Prolapse of the uterus (55-57)

The prolapse is a large, red, fleshy mass protruding from the vulva. A huge red mass, dotted with large clumps of blood, is seen protruding out of the vulva after calving. This really is an alarming sight but can be corrected effectively in most cases. However, if extensive bruising and or tearing of the vagina has been caused, e.g. when attempting to pull the calf out, complications can result.

Seek vet intervention immediately.

Until the arrival of the vet, the following first aid measures should be adopted.

- Prevent injury to the prolapsed uterus by birds e.g. crows and dogs or by other cows trampling it.**
- Remove dung and urine etc. on and around the prolapse and, if possible, wrap the clean prolapse in a clean blanket or gunny bag.**



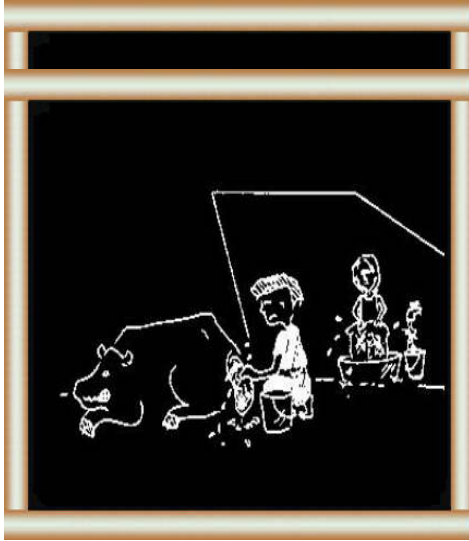
Prolapse of the uterus

55 At calving, you may see a large red mass with lumps which has come out from the vulva.

Call your vet immediately.

56 While you wait for your vet:

- make your animal comfortable and keep birds, dogs etc away



57

- remove dung and urine etc from on and around the prolapse
- wrap the clean prolapse in a clean blanket or gunny bag.

Prolapse of the vagina (58-61)

This is a condition that may affect cattle/buffalo towards the latter part of pregnancy. A part of the vagina protrudes from the vulva. In the first stages, the prolapse may be visible only when the animal is lying down, disappearing when it is in the standing position. Injury can be caused by the prolapsed vagina being dragged along the floor or by birds such as crows pecking at it. This must be prevented.

Some relief can be provided by tying the animal so that the hind quarters are at a higher elevation, e.g. the other way round in a normal standing. Seek vet advice if the prolapse persists.

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[Prolapse of the vagina](#)



58 In late pregnancy, a part of the vagina may come out from the vulva when your animal is lying down



59 Later, part of the vagina also appears when your animal is standing up.



60 Injury may come from:

- the prolapsed vagina dragging along the ground
- or by birds pecking at it.

You must prevent this.



61 Tie your animal so the hind quarters are higher than the fore quarters.

Call your vet if the vagina remains outside the vulva.

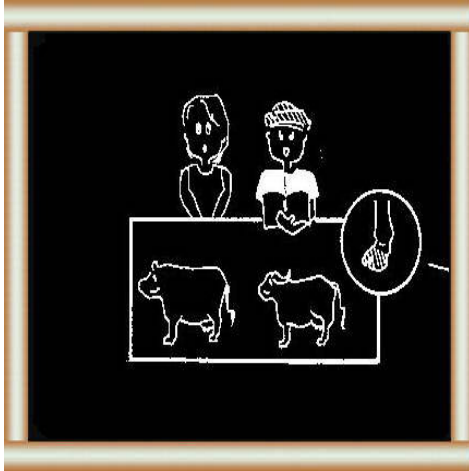
Rinderpest (62-66)

A highly infectious disease of cattle and buffalo and other cloven hooved animals, caused by a virus. The disease usually causes heavy mortality among affected animals. Presently it is found mainly in tropical areas.

Main symptoms include high temperature, loss of appetite, discharge from eyes and nose, coughing, diarrhoea, red patches in nostrils and mouth developing into shallow ulcers, loss of condition and death or recovery within 6-12 days. The recovered animals remain a source of infection to susceptible animals.

Post mortem examination shows an emaciated carcass, with the mouth, pharynx and vagina greatly inflamed and having rough areas covered by a membrane or even ulcers. The liver and spleen may be swollen and filled with blood. Congested areas and haemorrhages may be found in the intestinal and rectal walls.

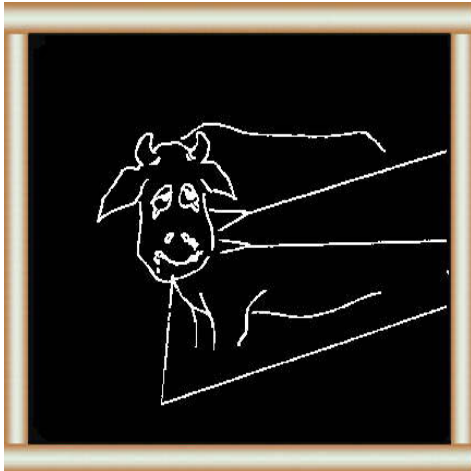
Vaccination of susceptible animals over 6 months of age and slaughter of infected animals are carried out as preventive and control measures. There is no effective treatment.



Rinderpest

62 Rinderpest is a virus disease which attacks cattle, buffalo and other animals with cloven hooves.

63 Signs of Rinderpest include:
- high temperature and loss of appetite and



V2

condition
- diarrhoea

64

- discharge from eyes and nose
- red patches in nostrils and mouth, becoming ulcers
- coughing.



**65 The animal dies or recovers within 6-12 days.
After recovery, the animal is still infectious.**

66 You cannot treat Rinderpest.



Slaughter infected animals and deal with carcasses and materials as for Anthrax (See 23, 24).

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Tick-borne diseases

There are two important diseases of domestic animals in more tropical and sub-tropical areas transmitted mainly by ticks of the *Boophilus* species. Temperate breeds of cattle are particularly susceptible to these diseases. Control is related to the control of ticks.

Bovine Babesiosis (Redwater Disease, Piroplasmosis, Tick Fever) (67-69)

This is caused by the protozoan parasites *Babesia bigemona* and *Babesia bovis*.

Symptoms are characterised by a sudden high temperature of 41 C (106 F) or higher. The animal stops eating and is dull with a staring coat. The mucous membranes become anaemic and may turn yellow later. The urine may turn red. If untreated, the animal becomes weak and may die within 2-3 days or the disease may become chronic with colic, diarrhoea and eventual death.

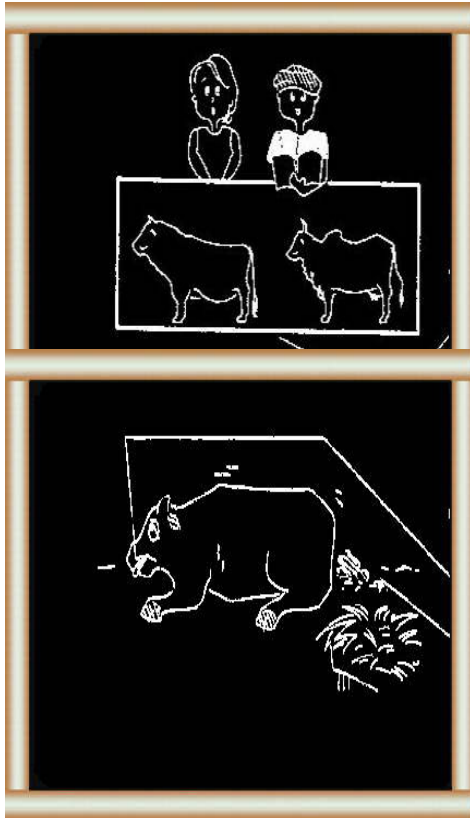
Diagnosis is confirmed by blood smears which show *Babesia* organisms.

The disease can be effectively treated, if diagnosed early.

page38

**Vaccinate animals over 6 months of age.
Tick-borne diseases (1)**

Bovine Babesiosis (Redwater Disease,



V2

Piroplasmosis, Tick Fever)

67 This is a parasitic disease which often attacks temperate breeds of cattle and may kill them in 2-3 days.

68 Signs of the disease include:

- high temperature, loss of appetite and dull, staring coat
- anaemic mucous membranes turning yellow
- red urine and diarrhoea.



69 Call your vet.
He will take a blood smear for diagnosis.
Your animal can recover if treated early.

page39

Anaplasmosis (Gall Sickness) (70-72)

This is caused by a rickettsial parasite found in the red blood cells and transmitted by ticks. There are two forms of the disease; the more severe form is caused by *Anaplasma marginale* and the less severe form by *Anaplasma centrale*.

The body temperature rises to about 40 C but not as high as in

babesiosis. Other symptoms are also less severe but the animals become weak and finally die, if untreated. The urine may become darkish yellow but not red as in babesiosis.

Diagnosis is confirmed by blood smears which show the presence of the parasite in the blood cells. Concurrent infection with babesia may confuse the diagnosis.

Early diagnosis and treatment gives good results. However, relapses are sometimes found, necessitating further treatment.

page40



**Tick-borne diseases (2)
Anaplasmosis (Gall sickness)**

**70 This is a parasitic disease
which can cause death if
untreated.**



71 Signs include:
- high temperature
- dark yellow urine.



72 Call your vet.
He will take a blood smear for diagnosis.
Animals can usually recover if treated early.
Animals sometimes get the disease again and need further treatment.

Tuberculosis (73-76)

This is a chronic, infectious disease affecting all species of animals including man. It is present in most countries and is caused by a group of pathogenic mycobacteria. Cattle and buffalo are affected by the bovine type of tubercle bacilli.

Tuberculosis is economically of greatest importance in cattle, buffalo, pigs and camels.

Symptoms vary according to where the tuberculosis organism is located in the animal and the route through which infection took place.

- If infected by inhalation, the disease is most common in lungs; the animal develops a cough, gradually becomes thinner and eventually dies.

- If infected by mouth, the main lesions may be in the throat, intestines and udder.

However, the disease is often diagnosed only at meat inspection after slaughter, when tubercles of varying sizes and enlarged lymph nodes are found.

The diagnosis is confirmed by the laboratory examination of a piece of infected tissue.

In the live animal, the tuberculin test is used for diagnosis. This test is best performed by a vet.

Treatment of infected animals should not be attempted. Effective means of control are to test the herds regularly every 6-12 months and to remove all reactors immediately for slaughter. In this way, a healthy herd can be built up from an infected herd.

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Tuberculosis



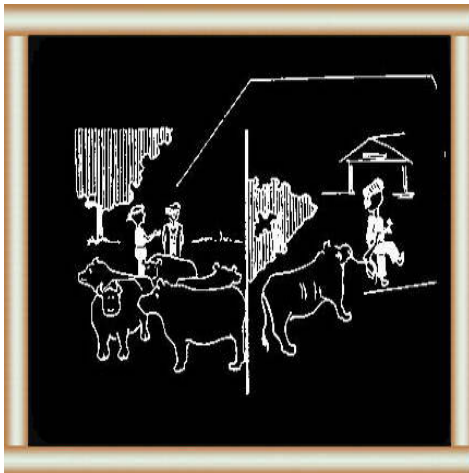
V2

73 Tuberculosis is a bacterial disease which attacks all animals and man. It is very important in cattle, buffalo, pigs and camels.

74 Signs include:
- coughing
- lesions in mouth and throat
- weight loss
and possible death.



75 You must call the vet for diagnosis and you should not try to treat your animals.



76 You can control Tuberculosis by:

- having your herd tested every 6-12 months
- slaughtering any animals with Tuberculosis.

Wounds (77)

A wound is a disturbance in the continuity of a tissue in the body e.g. a damage to the skin, muscle or both. The extent of damage may vary from a simple bruise to a severe laceration or even the severing off of an organ or a part of an organ.

First aid measures involve action to encourage arrest of bleeding, cleaning of wound and keeping it clean, preventing entry of dirt etc. A very important measure is to prevent insects such as flies laying their eggs on a wound because the fly larvae normally penetrate into the tissues causing extensive damage and recovery may be considerably delayed even when treated.

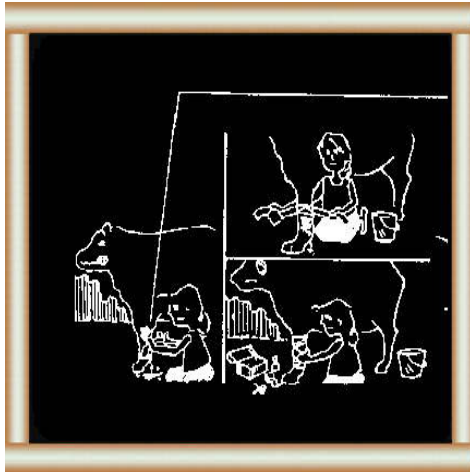
Small cuts or bruises (78)

There will be no bleeding or slight bleeding which stops automatically.

Clean the wound of any dirt immediately, using an antiseptic solution. Dress with an antiseptic/fly repellent at least once a day or as directed by the vet or indicated in the literature. Margosa oil has been used extensively in some countries because of its dual action as an antiseptic and a fly repellent. There are several proprietary preparations providing similar action and some others which can be

used to destroy fly larvae (maggots).

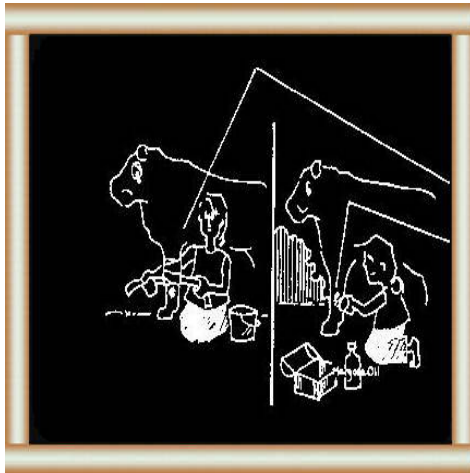
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Wounds

77 Wounds need quick action to:

- stop bleeding
- clean the wounds and prevent infection
- prevent insects e.g. flies laying eggs as the larvae cause more damage.



V2

78 For small wounds:

- clean with antiseptic solution
- apply antiseptic/fly repellent at least once a day or as your vet says e.g. Margosa oil.

79 For larger wounds, you must slow the bleeding till the vet arrives:

- press wound with hands till someone can bring a clean cloth



80

- keep the clean cloth pressed tightly over the wound for about 15 minutes.

You may use a bandage.

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Larger wounds (79-84)

When there are more extensive injuries there can be profuse bleeding. In this situation, the following procedure can be adopted, until vet arrives.

Apply direct pressure on the wound with fingers or palm while someone else brings a clean pillowslip, small towel or a piece of sheet which can be used as a pressure pad. Keep the pad over the wound and hold it firmly for about 15 minutes. It may even be

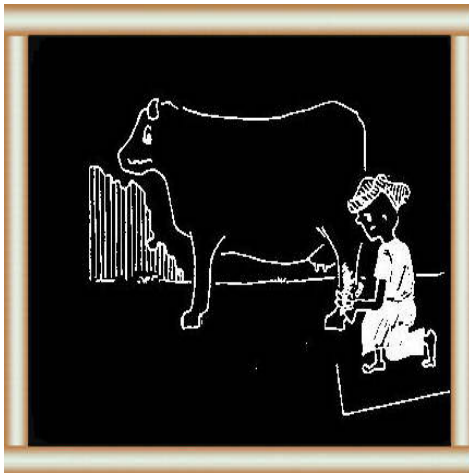
bandaged to keep in place.

If these measures fail to stop bleeding, a tourniquet may be applied, using a piece of rubber tubing or a soft rope. It is not very easy to determine whether an artery or a vein has been damaged. A tourniquet may therefore be applied above the wound to prevent any blood flowing from the heart towards the wound. If the bleeding increases, it should be loosened and applied on the other side of the wound. A tourniquet should never be kept on for more than 20 minutes. Its release should be gradual to prevent a sudden rush of blood towards the wound. The tourniquet may be applied again for a similar period after a few minutes, if the bleeding continues.

An attempt to clean and treat such a wound may be made only by an experienced person, preferably a vet. In addition to dressing the wound, application of sutures and administration of antibiotics etc. may be necessary.



**81 If you cannot stop the bleeding, use a piece of rubber tubing or soft rope as a tourniquet.
First place the tourniquet above the wound.**



82 If the bleeding increases, place the tourniquet on the other side of the wound.



83 After 20 minutes gradually release the tourniquet and leave for a few minutes. If bleeding continues, apply the tourniquet again.



84 Call your vet to clean and treat large wounds.

What do you know about diseases of dairy cattle and buffalo?**Definition of disease**

Change or disturbance in the body ([4-6](#))

Disease as a cost

- 1 Lower production and reproduction** ([7,11,12](#))
- 2 Passed on to other animals and people** ([9](#))
- 3 Treatment** ([10](#))
- 4 Death** ([11](#))

Main types of disease

- 1 Micro-organisms** ([14](#))
- 2 Parasites** ([15](#))
- 3 Body and feed problems** ([16](#))

More important diseases

- 1 Anthrax** ([17-26](#))
- 2 Black-Quarter** ([27-31](#))
- 3 Bloat** ([32-38](#))
- 4 Brucellosis** ([H.10.2](#))
- 5 "Downer" Cow** ([39-45](#))

6 Foot and Mouth Disease	(H.10.3)
7 Haemorrhagic Septicaemia	(H.10.4)
8 Johne's Disease	(46-49)
9 Mastitis	(H.10.5)
10 Parasites	(H.10.6)
11 Poisoning	(50-54)
12 Prolapse of the uterus	(55-57)
13 Prolapse of the vagina	(58-61)
14 Rinderpest	(62-66)
15 Tick-borne Diseases	
- Bovine Babesiosis	(67-69)
- Anaplasmosis	(70-72)
16 Tuberculosis	(73-76)
17 Wounds	(77-84)

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Small-Scale

Dairy Farming Manual

Volume 5

Husbandry Unit 10.2

BRUCELLOSIS

page49



What should you know about Brucellosis?



What is Brucellosis? (5-10)

1 Brucellosis is a bacterial disease which is dangerous for your animals and you.



What are the signs of Brucellosis? (11-17)

2 The signs include:

Cows: abortion or still birth

Bulls: inflamed reproductive organs.



How can your animals get Brucellosis? (18-26)

3 By:

- eating food and drink with the virus
- injured skin coming into contact with the virus.

At service.



How can you treat, prevent and control Brucellosis? (27-30)

4 You cannot treat Brucellosis.

You can only prevent and control it.

Brucellosis

Husbandry Unit 10.2:

Technical Notes

Note: Numbers in brackets refer to illustrations in the Extension Materials.

Introduction (5-8)

Brucellosis is an infectious disease, causing abortion, infertility and decreased milk yield in cattle. It may cause serious disease in people as well.

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[What is Brucellosis?](#)

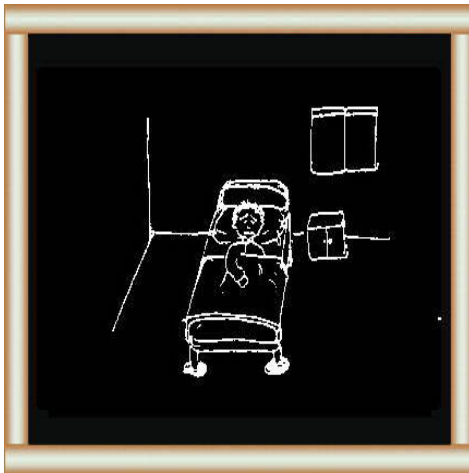


5 Brucellosis is a disease which can pass easily from one animal to another.

6 Your cows can lose their calves because of the disease.



7 If your cows get Brucellosis, they produce less milk (because of abortion).



8 Brucellosis is also a dangerous disease for people.

Brucellosis causes

- fever
- headache
- muscle pain
- weakness.

Cause of disease (9)

Brucellosis is caused by a bacteria. The type which affects cattle is called Brucella Abortus. The bacteria can survive not only in the animal but also in the surroundings for some time.

Affected animals (10)

Brucellosis can attack cattle, buffalo, goats, sheep, dogs, horses, and a number of other animals as well. People can also get seriously ill when infected from cattle with Brucellosis; the disease in man causes fever, headache, muscle pain and weakness.

page54

[What causes Brucellosis?](#)



V2

9 A bacteria, *Brucella Abortus*, causes the disease.

This bacteria can live for a long time in the animal and in the surroundings.

Which animals get Brucellosis?

10 Brucellosis attacks:

- cattle
 - buffaloes
 - goats
 - sheep
 - dogs
 - horses
 - people
- and other animals.**



What are the signs of Brucellosis?
Abortions and still born calves
11 Cows with Brucellosis have abortions or still born calves, usually in the last 4 months of pregnancy.
After abortion, there are bacteria in:

- the discharge from the uterus
- the milk
- the foetus
- the placenta.

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Signs of disease (11-16)

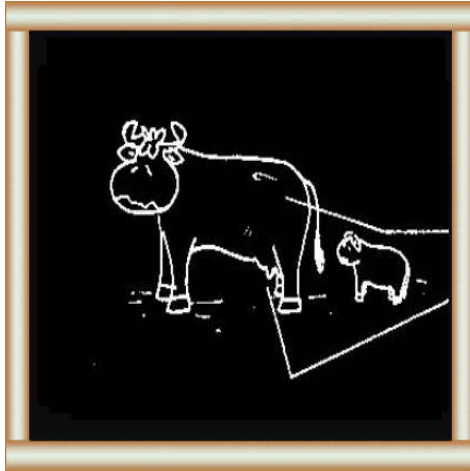
Abortions and still-born calves delivered at, or just before, term are often the two most obvious features to be observed. Abortion usually takes place in the last half of pregnancy. After abortion metritis (i.e. infection of the uterus) will follow in the majority of cases, impairing the fertility of the animal. Other signs of Brucellosis infection in a herd may be increased incidence of retained placenta (i.e. placenta is not delivered after birth, but stays in the uterus) and decreased milk yield.

After abortion, bacteria are found in the placenta and foetus, and also

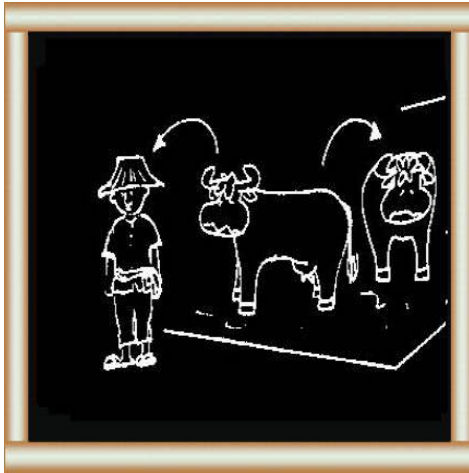
in the uterine discharges of the cow and in the milk.

If a cow has aborted once, she will normally not abort again due to Brucellosis - but she will continue, at subsequent normal calvings, to shed the bacteria from the uterus and in the milk. In this way she is a permanent risk to other cows, and to people as well.

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12 Next pregnancy, your cow will normally not abort because of Brucellosis but bacteria still live in the uterus and in the milk.



13 Your cow passes Brucellosis on to other animals and to other people.



14 After abortion your cow may get an infection in the uterus (metritis).

If the infection is serious your cow may not get pregnant again.



Retained placenta
15 If your cow has Brucellosis, the placenta may stay in the uterus.

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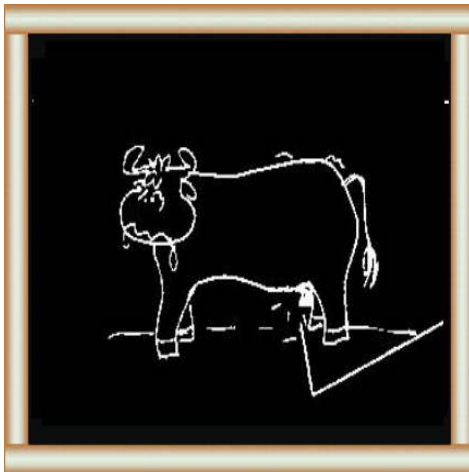
Bulls can also be affected. In bulls the bacteria cause inflammation of the testicles and other reproductive organs. This means that the bacteria can be present in the semen. (17)

Pregnant cows and heifers are much more susceptible to infection than non-pregnant animals. Calves not yet at puberty are fairly resistant to infection.

page58



Low milk production
16 Cows with Brucellosis have abortions and so produce less milk.



Inflammation of the male reproductive organ
17 Bulls with Brucellosis have inflamed testicles.
The semen can contain bacteria.

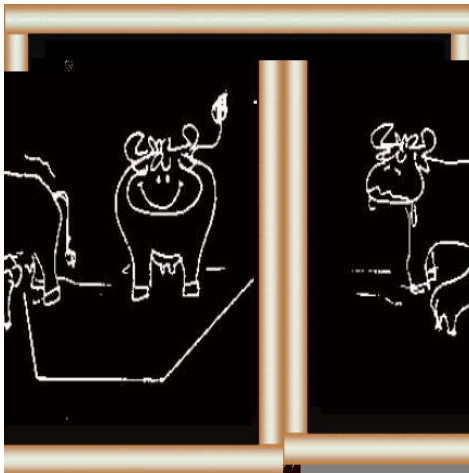


How can your animals get Brucellosis?

18 By contact with the bacteria.

The bacteria live in:

- the discharge from the uterus
- the placenta
- the aborted foetus



19

- the milk.

Colostrum from cows with Brucellosis can give the disease to calves from cows which do not have Brucellosis.

Transmission (18-23)

Infected cows and heifers are the most common sources of infection. As mentioned above: If a cow has once been infected, it will keep on housing and excreting bacteria for a lifetime, even after it is apparently normal again. This means the cow has become a carrier that can infect the rest of the herd.

Bacteria are especially found in the placenta, aborted fetuses, uterine fluid and discharge from the vagina as well as milk from infected cows. Colostrum can transmit the disease to calves of uninfected cows.

Semen used from infected bulls can also transmit the disease to cows by A.I. or, in rare cases, by natural breeding.

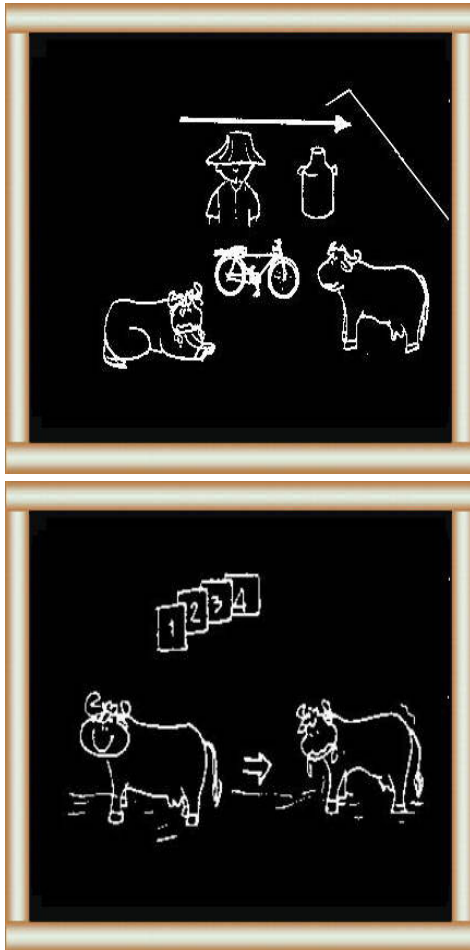
Bacteria spread by infected cows can survive for weeks outside the body, and the possibility of spreading disease through con-taminated tools, people or other animals is large.

The incubation period, i.e. the period from exposure to the infective agent until signs of disease, is very different from case to case, from about 1-2 weeks until several months.



20 Semen with bacteria can pass on Brucellosis in A.I. and sometimes in natural mating.

21 Bacteria live for some time outside the

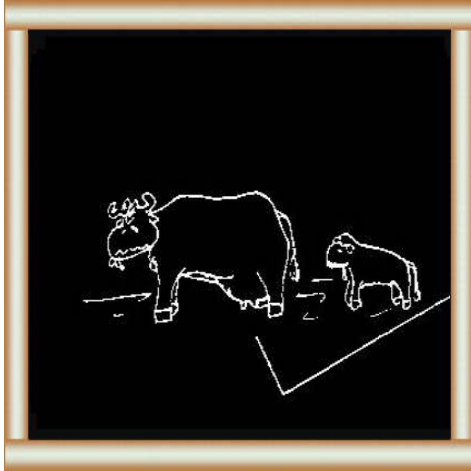


V2

body.

Vehicles, equipment and you can easily carry the bacteria from one animal to another.

22 The period from contact with the bacteria to signs of the disease can be 1 week up to 3 or 4 months.



23 Pregnant cows and heifers get Brucellosis more easily than non-pregnant animals.

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Diagnosis (24-26)

Blood samples from infected animals can be tested in the laboratory for disease. Similarly, samples of discharge from the vagina or from aborted foetus (stomach) can be sent to the laboratory for diagnosis.

Diagnosis on a herd basis, is often undertaken by screening herds with the Milk Ring Test (MRT) (also called Brucellosis Ring Test, BRT).

This simple test can be carried out on bulk milk either on the farm or during reception at the dairy plant/milk collecting centre. When

infected herds are located by BRT, reactors are found individually by serological testing. An area can be continuously screened by applying the BRT this way 3-4 times a year.

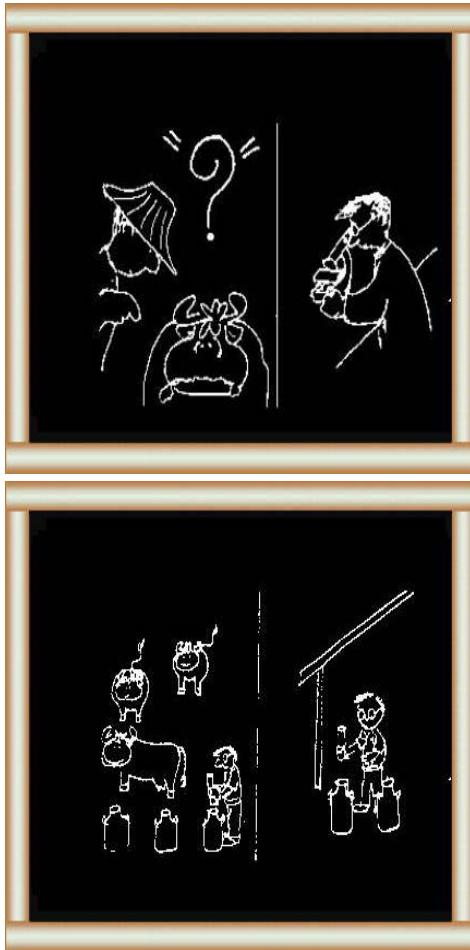
Another way to screen herds in a country or a region is to examine blood samples of all cattle in the area but this is of course far more costly and the BRT is sufficiently reliable as a screening test if followed by blood testing of individual cattle in reactor herds.

In areas where the BRT is applied to dairy herds serologic testing of all marketed beef cattle can be undertaken. If reactors are found the herd of origin is tested by individual blood testing.

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[How can you know if your animals have Brucellosis?](#)

[24 Your vet can identify Brucellosis by](#)

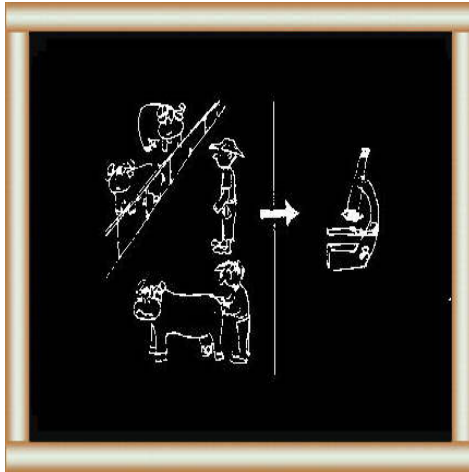


V2

laboratory tests on:

- blood
- discharge from the vagina
- stomachs from aborted fetuses.

25 He can check your herd 3-4 times a year by the Milk (or Brucellosis) Ring Test on your farm or at the milk collecting centre.



26 If the Milk Ring Test is positive he takes blood samples of all your animals for laboratory testing.

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Treatment and prevention (27-30)

Treatment of individual animals has been tried, but without success.

On the other hand, successful eradication of the disease has been carried out in several countries by detection and slaughter of infected animals, followed by proper disinfection of premises and succeeding testing of remaining animals in the herd.

It must be kept in mind that even though animals that have aborted

once normally calve at term in the following calvings these animals keep on secreting bacteria from the uterus and genital organs after calving and frequently continuously in the milk. This means that other animals in the herd will be infected sooner or later, if the carriers are not slaughtered.

Prevention is possible by vaccination of female calves. This gives a high grade of protection although some animals may be infected if they are heavily exposed to Brucellosis bacteria.

Replacement animals should be tested before introduction into the herd and/or they should be vaccinated animals only.

Vaccination on a national scale has been practised with a high degree of success, provided the aim is a reasonable level of control with the disease. Complete eradication in a region or a country, needs slaughter of infected animals and continuous screening, possibly combined with vaccination of calves. The slaughter policy has been applied with success in some European countries. In Asia, vaccination is often obligatory, and slaughter of infected animals recommended to farmers.



How can you treat animals with Brucellosis?

27 You cannot treat Brucellosis.



How can you prevent and control Brucellosis?

28 You can control Brucellosis by:

- slaughtering infected animals
- disinfecting everything
- testing all other animals in your herd regularly.

Remember: If your cow has Brucellosis, it continues to release the disease even after it looks healthy again!



29 Vaccination of female calves helps prevent Brucellosis but they may still get the disease with a lot of contact with the bacteria.



30 Always test new animals before mixing them with your herd.

What do you know about Brucellosis?**Cause****Bacteria** (9)**Susceptible animals****1 Many animals and human beings** (10)**2 Pregnant cows and heifers especially susceptible** (23)**Signs****1 Abortions and still-born calves** (11-14)**2 Retained placenta** (15)**3 Low milk production** (16)**4 Inflammation of male reproductive organs** (17)**Transmission****By contact with bacteria:****1 Uterus, placenta, aborted foetus** (18)**2 Colostrum and milk** (19)**3 Semen** (20)**4 Vehicles and equipment** (21)**Incubation period****1 week - 4 months** (22)

Diagnosis**1 Laboratory tests** ([24](#))**2 Milk (Brucellosis) Ring Test** ([25-26](#))**Treatment****No treatment** ([27](#))**Prevention and control****1 Slaughtering** ([28-30](#))**2 Disinfecting****3 Testing**

page66&67



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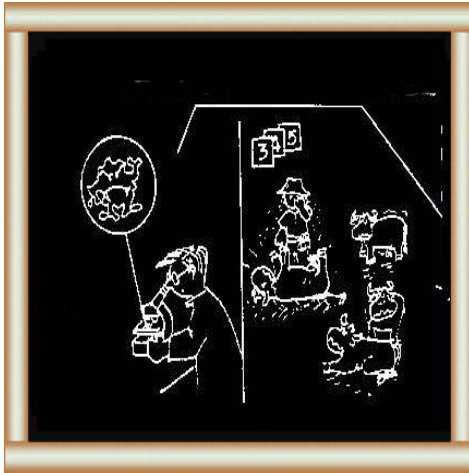
Volume 5

Husbandry Unit 10.3

FOOT AND MOUTH DISEASE

page69





V2

What is FMD? (5-12)

1 FMD is:

- a virus disease
- dangerous to all animals with cloven hooves.

What are the signs of FMD? (13-17)

2 The signs include:

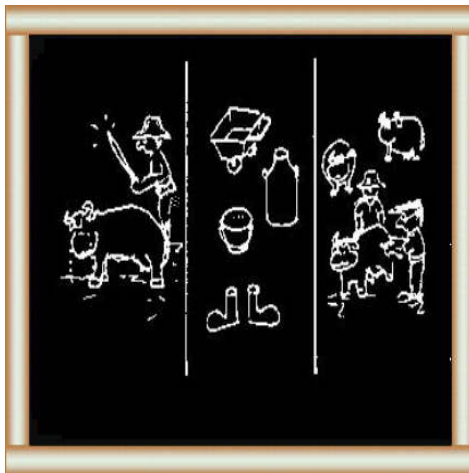
- drooling
- blisters
- fever and lameness.



How can your animals get FMD? (18-24)

3 By:

- breathing in air with the virus
 - eating food or drink with the virus.
- At service (rarely).



How can you treat, prevent and control FMD? (25-37)

4 You cannot treat FMD.

You can only prevent and control it.

FOOT AND MOUTH DISEASE (FMD)

Husbandry Unit 10.3:

Technical Notes

Note: Numbers in brackets refer to illustrations in the Extension Materials.

Introduction (5-8)

This disease spreads very quickly and outbreaks normally include rapid infection not only of most animals in a herd, but also of more herds in a region. The death rate in adult animals is normally low, but big losses occur from the following: lack of weight gain, reduced milk yield and mastitis, and general un-thriftiness.

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[What is Foot and Mouth Disease \(FMD\)?](#)



5 FMD is a dangerous disease.
It spreads very quickly from one animal to another

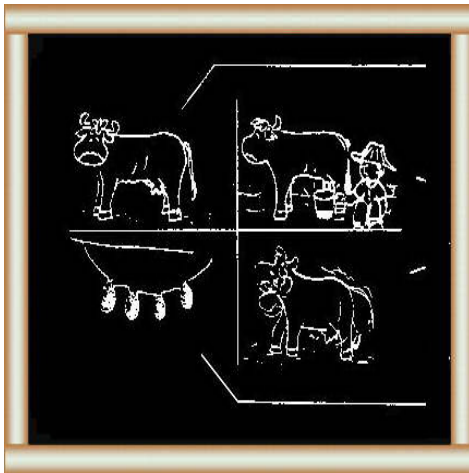


6 and from one area to another.



7 Your cow usually has the disease for 2-3 weeks.

Only a few cows die from FMD



8 but you lose money from:

- low weight gain
- low milk yield
- mastitis
- unthriftiness

even after the cow has recovered from FMD.

Cause of disease (9-10)

The disease is caused by a virus (Foot and Mouth Disease Virus or FMD Virus). Under certain climatic conditions the virus can survive for a long time outside the body and remain infective.

Affected animals (11-12)

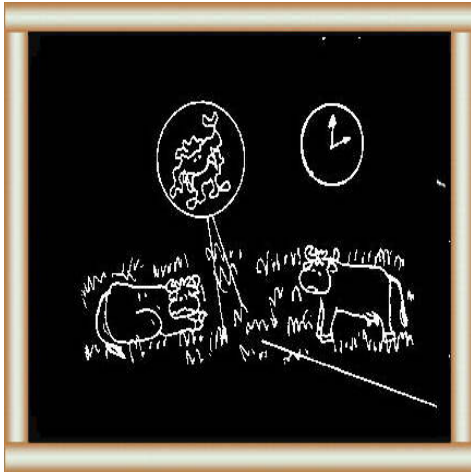
All cloven-hooved animals, including cattle, pigs, sheep, goats, buffalo, deer and elephants (but not horses) are affected by the disease. The disease is not dangerous to people.

page74

What causes FMD?



9 FMD virus causes the disease.



10 FMD virus can live for a long time outside the body and still be infective



What animals get FMD?

11 All animals with cloven hooves:
cattle, pigs, sheep, goats, buffalo, deer,
elephants.

FMD does not affect horses



12or people.

Signs of disease (13-17)

Infected animals will show drooling, vesicles on the nose and in the mouth, and between the claws as the first signs of disease, normally 1-15 days (average 2-6 days) after exposure to the virus.

The drooling, with long ropes of stringy saliva hanging from the mouth, is a typical sign. Animals consume only liquids or stop eating and drinking completely, they shiver and have high fever. Salivation and lameness, due to vesicles in the mouth and between the claws, are evident. By opening the mouth vesicles may be seen on tongue, palate and other places - or the vesicles have ruptured and left open, bleeding wounds. The fluid contents of the vesicles are highly infective. The ulcers normally heal in 1-2 weeks.

The udder may be affected, with vesicles on the teats and on the udder itself. Infected milk yielding animals show a rapidly decreasing milk production. Young animals may be infected by suckling milk from such cows.

If the animal recovers from disease it normally shows aftermath in the form of hoof deformities, mastitis and decreased milk production and unthriftiness (no weight gain). Abortion and infertility may also be seen after recovery from acute disease.

Disease normally lasts 2-3 weeks in the animal, and goes through the

herd in about 1-3 months. Although only a few animals die, losses from reduced production during the acute outbreak, and from the diseases following later, are normally large.

page76

What are the signs of FMD?



13 Within 1-15 days after getting FMD (usually 2-6 days):
Drooling
Long ropes of stringy saliva hang from the mouth.



Low appetite

14 Your cow takes only liquid food or stops eating.



Blisters

- 15 Blisters appear:
- on the nose and in the mouth.
 - on the teats
 - between the claws.

The blisters break and can become bleeding ulcers.
They usually heal in 1-2 weeks.



Fever and lameness
16 The virus causes:
- shivering and high fever
- lameness from blisters/ulcers.

Transmission (18-24)

Normally the disease goes from animal to animal through the air or by direct contact with virus containing secretions (for instance from ruptured vesicles). Transmission by wind over many kilometres is possible.

Infected pigs excrete large amounts of virus and are considered extremely infectious.

Infected animals, that still did not show any signs of disease, as well as animals that have recovered from disease, may contain and excrete the virus.

Passive transmission by other animals and bedding, by people, vehicles, tools etc is common.

Transmission through milk and meat is highly possible, and pasteurization does not necessarily destroy the virus. Pigs being fed virus-containing meat can easily acquire the disease and readily infect other animals - for instance cattle.

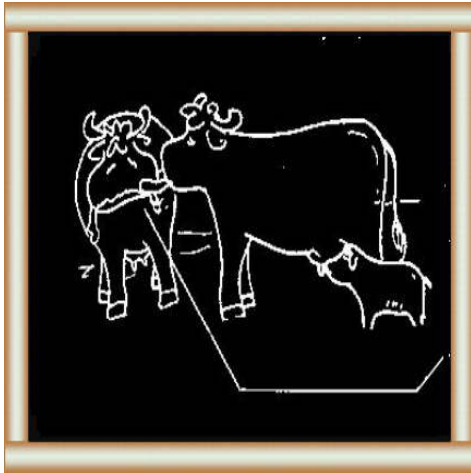
Transmission by A.I. (infected semen) is possible, but uncommon.



Low milk production

17 Cows with FMD produce little milk.

How can your animals get FMD?



V2

Direct contact

18 Liquid from the blisters contains the virus.



Indirect contact

19 Vehicles, equipment and you may carry the virus from one animal to another.



**20 Milk and meat can carry the virus from one animal to another.
Pasteurization does not always kill the virus.**

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21 Pigs may eat meat with FMD virus.



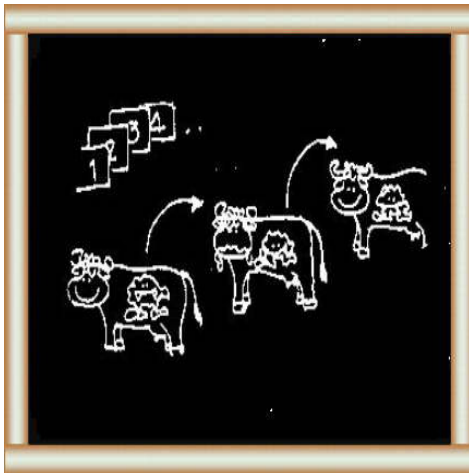
V2

They pass on large amounts of the virus which can infect your cows.

22 In A.I., semen with the virus can pass on FMD but this is unusual.



23 The wind can carry the virus from one cow with FMD to another.



24 Animals which:
- have the virus inside but do not yet show signs of FMD
- have recovered from FMD
can pass on the FMD virus.

Treatment (25-26)

No real cure against FMD exists. As the disease develops treatment may be undertaken to alleviate the condition, such as local treatment of wounds and antibiotic treatment against further bacterial infection.

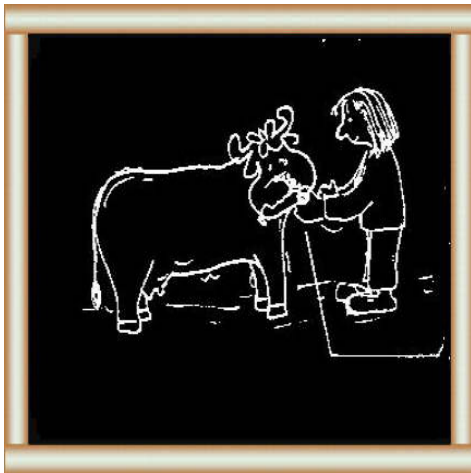
Diagnosis (27)

There are other diseases (for instance Vesicular Stomatitis) which cause vesicle formation in the mouth and may be confused with FMD. A safe diagnosis can be made by laboratory examination of material from acutely sick animals.



How can you treat animals with FMD?

25 You cannot cure FMD. You can only:
- clean and disinfect the ulcers and open wounds



26
- give antibiotics to stop further bacterial infection.



How can you know if your animals have FMD?

27 Other diseases also cause ulcers in the mouth.

Your vet can identify FMD by laboratory tests.

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Prevention and control

Vaccination is possible and normally carried out on a national (or regional) level. As a rule, immunity after vaccination lasts 6 months. (28)

Many different strains of virus mean that even vaccinated animals

may get FMD, because not all strains of virus may be covered by the vaccine used. (29)

Any suspicion of FMD should result in prompt isolation measures - isolation of infected animal(s) within the herd and especially isolation of the herd as a whole from other herds. Not only should animals from infected herds not be moved, but people, vehicles etc should stay away from other cattle herds and make sure that they only leave the infected herd after proper cleaning and disinfection of themselves, their clothes, tools, and vehicles etc. (30-33)

page83

[How can you prevent and control FMD?](#)

[Vaccination](#)

[28 The extension worker can vaccinate your](#)



V2

animals.

This usually protects your animals for about 6 months

29 but there are many types of FMD virus, and not all may be covered by the vaccine.

Your animals may still get FMD after vaccination



Isolation

30 If any of your animals show signs of FMD:
- isolate those animals from your herd



31

- isolate your herd from other herds.

Disinfection can be carried out with sodium hydroxide, sodium carbonate or acetic acid. Carcasses should be burnt or buried, and premises then thoroughly disinfected. (34-36)

page85



32 Never move an animal, bedding grass or equipment from an infected herd.



33 Try to keep people, vehicles etc away from infected herds.



34 Disinfect anything - vehicles, equipment, clothes, you - which contacts an infected place or infected animals.



35 You can use:

- sodium hydroxide
 - sodium carbonate
 - acetic acid
- as disinfectants.

Follow the directions on the labels and ask your extension worker for advice.

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Most countries have special regulations concerning FMD, sometimes including restricted movement of animals, isolation and possibly slaughter of infected animals. (37)

page87



36 Burn or bury dead animals, and bedding and disinfect everything on your farm.



37 Consult your extension worker about what you can and cannot do.

You may have to slaughter infected animals.

What do you know about FMD?**Cause****Virus****([9-](#)
[10](#))****Susceptible animals****1 Animals with cloven hooves****([11](#))****2 Human beings****([12](#))****Signs****1 Drooling****([13](#))****2 Low appetite****([14](#))****3 Blisters****([15](#))****4 Fever and lameness****([16](#))****5 Low milk production****([17](#))****Transmission****By contact with the virus:****1 from blisters****([18](#))****2 vehicles and equipment****([19](#))****3 milk and meat****([20](#))****4 faeces****([21](#))****5 semen****([22](#))**

6 wind	(23)
Animals with no signs of FMD can pass on the virus	(24)
Diagnosis	
Laboratory tests	(27)
Treatment	
No cure but:	
1 disinfection	(25)
2 antibiotics	(26)
Prevention and control	
1 Vaccination	(28-29)
2 Isolation	(30-33)
3 Disinfection	(34-35)
4 Burning and burial	(36)
5 Consult extension worker on other measures and slaughtering	(37)



Small-Scale Dairy Farming Manual

Volume 5

Husbandry Unit 10.4

HAEMORRHAGIC SEPTICAEMIA

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Extension Materials

What should you know about Haemorrhagic Septicaemia (HS)?



What is HS? (5-7)

1 HS is a bacterial disease which attacks many animals but not people.



What are the signs of HS? (8-12)

2 The signs include:

- discharge
- swellings
- fever
- bloody diarrhoea.



How can your animals get HS? (13-19)

3 Many normal animals have the bacteria but show no signs.

Under stress, these animals show signs and pass large numbers of bacteria to infect other animals.

How can you treat, prevent and control HS? (20-22)

4 You should call the vet to advise you.

HAEMORRHAGIC SEPTICAEMIA (HS)

Husbandry Unit 10.4:

Technical Notes

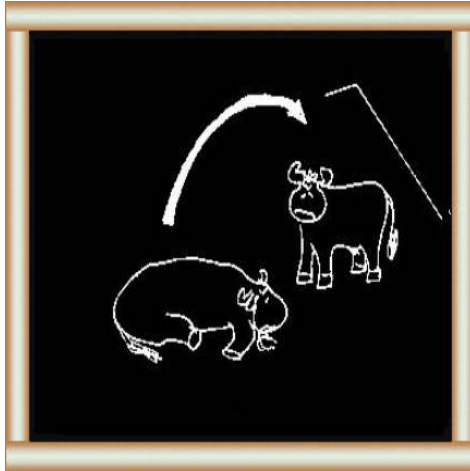
Note: Numbers in brackets refer to illustrations in the Extension Materials.

Introduction (5-6)

This is an acute infectious disease of buffaloes and cattle of particular importance in Asia. Buffalo are especially sensitive. Goats, sheep, pigs and horses may also get the disease, whereas people are not affected.

Cause of disease (7)

The disease is caused by a bacteria called Pasteurella Multocida. The bacteria may be present in animals without causing disease. Under some circumstances when the animals are weaker and more stressed than normal the bacteria multiply and disease suddenly appears.



What is Haemorrhagic Septicaemia (HS)?

5 HS is a dangerous disease which can pass easily from one animal to another.

Which animals get HS?



V2

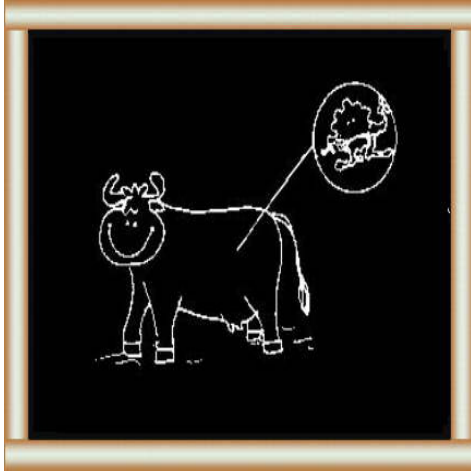
6 HS attacks

- buffaloes (very sensitive)
- cattle
- goats
- sheep
- pigs
- horses.

It does not attack people.

What causes HS?

7 A bacteria *Pasteurella Multocida* causes the disease.



What are the signs of HS?

8 Strong animals may carry the bacteria but show no signs.

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Signs of disease (8-12)

HS is seen as an acute condition, with sudden and serious onset that easily causes death.

Animals become dull and have high fever. They refuse to eat and salivate more than normally. There is also discharge from the nose. Swellings develop typically and quickly, especially around the throat, the brisket, the dewlap and sometimes around the head. The tongue

may swell also and protrude from the mouth. Finally, the animal has difficulty breathing because the swellings impair respiration and it may die from this obstruction of the respiratory tract. In some cases a bloody diarrhoea may be an obvious part of the disease picture.

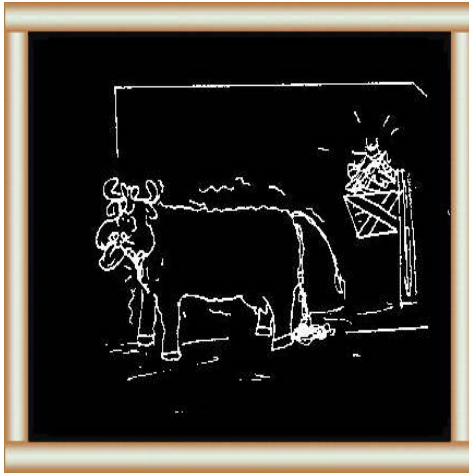
Sick animals may die in a few hours but sometimes disease lasts up to 3-4 days before death occurs in untreated animals. For animals with acute disease, which are left untreated, the death rate is high.

page96



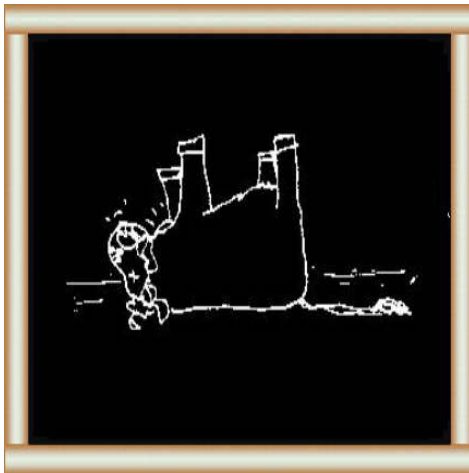
9 Cows with HS:

- salivate more than usual
- have a discharge from the nose
- have a swollen tongue which may stick out from the mouth
- have swellings round the neck



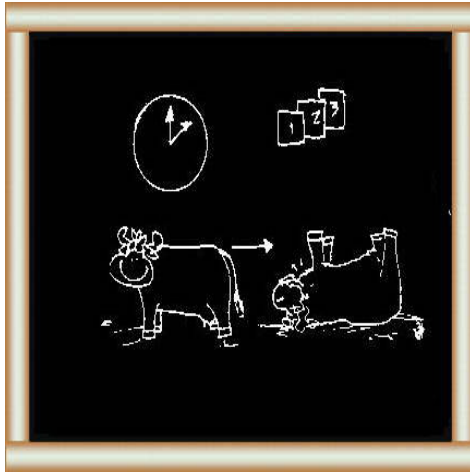
10

- have swellings round the brisket, dewlap and sometimes the head
- are dull and have high fever
- may have bloody diarrhoea.



11 The swellings make breathing difficult and your cow may die.

A sudden death is often the first sign of infection.



12 Animals with HS can die quickly.

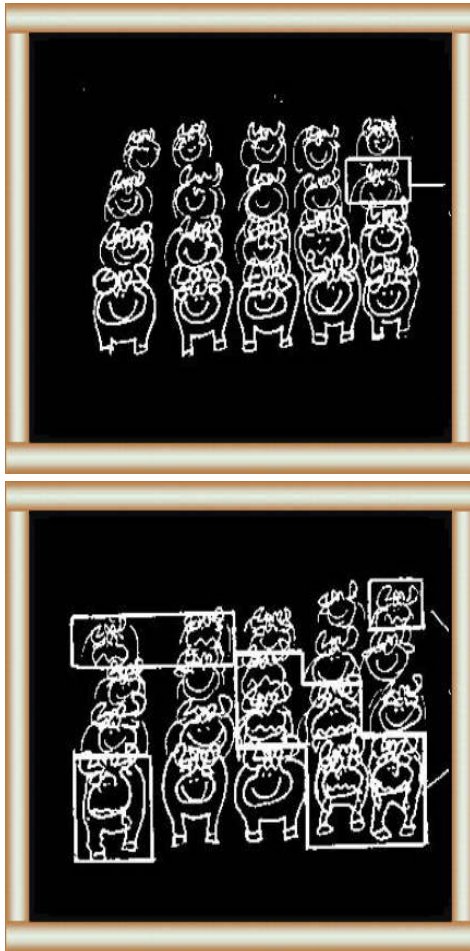
page 97

Transmission of disease (13-17)

The bacteria can normally be found in a small percentage of a buffalo or cattle population, apparently not causing any disease. When fodder supply and climate are particularly unfavourable, disease outbreaks occur. This is often seen at the beginning of the rainy season: the scarce fodder supply at the end of dry season, the fodder change, and the increased workload, that some animals are subject to with the onset of rainy season, stress the animals and the

number of outbreaks may rise dramatically. Transportation over long distances and/or under bad (crowded) conditions, may also cause disease outbreaks.

The bacteria can be found in saliva and nasal discharge from sick animals. In this way food, drinking water and surroundings may be contaminated, and the bacteria can survive here for some hours. Other animals may then pick up the bacteria and, depending on their general condition, develop disease.



V2

13 Normally, 1 animal in 20 in a cattle or buffalo herd has the bacteria with no signs of disease.

14 Many animals get HS when conditions are difficult:



15

- bad weather
- little food at the end of the dry season



16

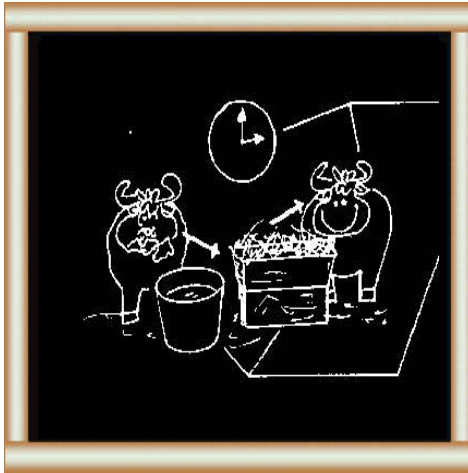
- heavy work at the beginning of the rainy season
- moving long distances and overcrowding.

Diagnosis (18-19)

Often, observation of clinical symptoms will be sufficient to establish diagnosis. Highly acute disease with throat swellings and high death rate suggests HS but the disease may be confused with Anthrax, Rinderpest, Blackquarter or poisoning.

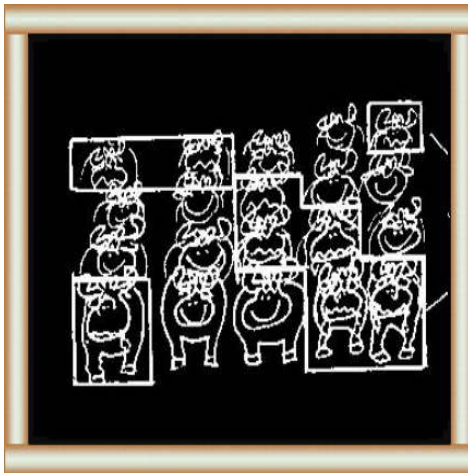
Blood samples from acutely sick or recently dead animals, or samples of the fluid contained in the swellings, should be sent to the laboratory for diagnosis. Pieces of internal organs from recently dead animals should also be sent for diagnosis.

page100



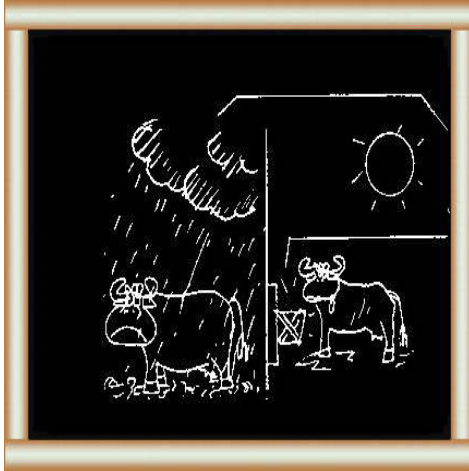
17 Bacteria in saliva and discharge from the nose can get into water and food.

They can live for a few hours and pass to other animals who eat or drink.



How can you know if your animals have HS?

18 The vet knows the disease maybe HS if many cows die with swellings in the throat.



19 He can make sure it is HS (and not Anthrax, Rinderpest, Blackquarter or poisoning) by laboratory tests of:

- blood
- liquids from the swellings
- organs from animals not long dead.

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Treatment (20-21)

Treatment should be initiated in the earlier stages of disease. It should consist of intravenous injections of broad-spectrum antibiotics or sulphonamides. Recovery is possible when treatment is undertaken early. For animals treated too late, or not treated at all, the mortality rate is high. Prompt vaccination and antibiotic/sulphonamide treatment may be combined.

Prevention and control (22)

The best control is annual vaccination, preferably carried out just

before the high risk (rainy) season. Vaccines are available that give immunity lasting for a year. Immunity starts about 2 weeks after vaccination.

Calves should be more than 3 months before vaccination is given, but before this age they may acquire some immunity by suckling the milk of vaccinated dams.

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How can you treat animals with HS?

20 Call the vet at the first signs of the disease (or when there is a sudden death among your cattle/buffalo).



21 He can give injections of:

- antibiotics or
- sulphonamides.

Your animals may recover if you treat them early.



How can you prevent and control HS?

22 Vaccinate all animals (except calves under 3 months) every year.

What do you know about HS?**Cause****Bacteria (7)****Susceptible animals****Many animals but not human beings (6)****Signs****Animals may have HS but show no signs (8)****1 Salivation and nasal discharge (9)****2 Swellings on tongue and neck (10)****3 Swellings on brisket and dewlap****4 Dull with high fever****5 Bloody diarrhoea****6 Difficulty in breathing (11)****Animals usually die within 4 days without treatment (12)****Transmission****Conditions conducive to getting and transmitting HS include:****1 Difficult conditions (14-16)**

2 Bacteria in water and food	(17)
Diagnosis	
Laboratory tests	(18-19)
Treatment	
Call vet for injections	(20-21)
Prevention and control	
Vaccination	(22)

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volume 3

Husbandry Unit 10.5

MASTITIS

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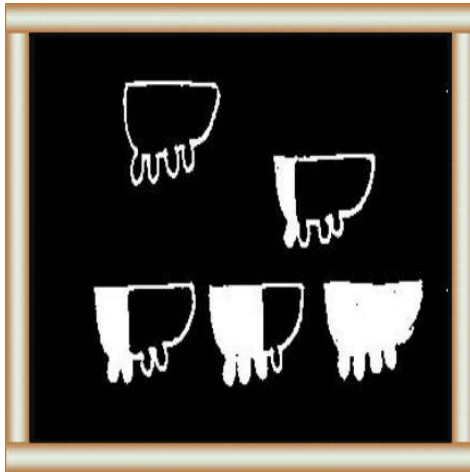
MASTITIS

Husbandry Unit 10.5:

Technical Notes

Note: Numbers in brackets refer to illustrations in the Extension

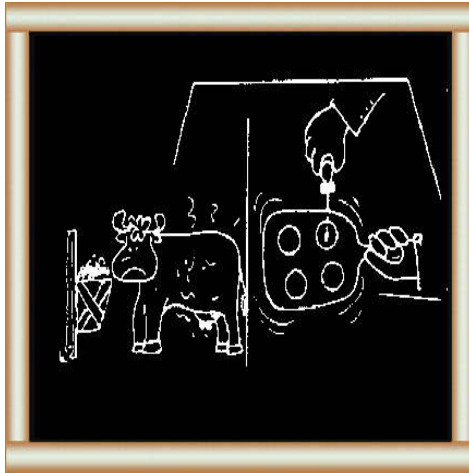
Extension Materials



What should you know about Mastitis? (5-16)

1 Mastitis is an inflammation of the mammary glands and may be:

- acute
- chronic.



**How can you know if your cow has mastitis?
(17-24)**

2 You should know:

- the signs
- the tests.



Why do your cows get Mastitis? (25-27)

**3 If your cow's teats are not healthy and
clean, bacteria may enter and cause Mastitis.**



How can you treat and prevent mastitis? (38-64)

4 You should:

- always call the vet if one of your cows has mastitis
- make sure your cows have good health, hygiene and housing.

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The cost of mastitis (5-9)

In many dairy countries mastitis may be the most costly disease of the dairy industry.

Most dairy farmers see the obvious costs:

- Fees for veterinary treatment and drugs;
- Lost production from acutely affected udders;
- Withdrawal time for milk and meat due to antibiotic residues after

treatment.

There are also hidden costs.

- Cows with subclinical mastitis may have low milk production. Low milk production from subclinical mastitis usually costs more than the treatment of acute mastitis.

- Milk from cows with mastitis is lower in quality than milk from cows with normal glands:

- the cell count is higher;**
- the milk contains less lactosis, fat, protein and other desirable substances.**

This means less payment from the dairy.

Mastitis in buffalo

Generally mastitis is regarded to be of low economic importance where most types of buffalo are raised for draught power. In lactating herds, however, the disease is of tremendous importance.

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[Why is mastitis important?](#)



5 Mastitis costs you money.

You must pay for veterinary fees and medicines.



6 You get less money from the collection centre if your milk is low quality (from an udder with mastitis).



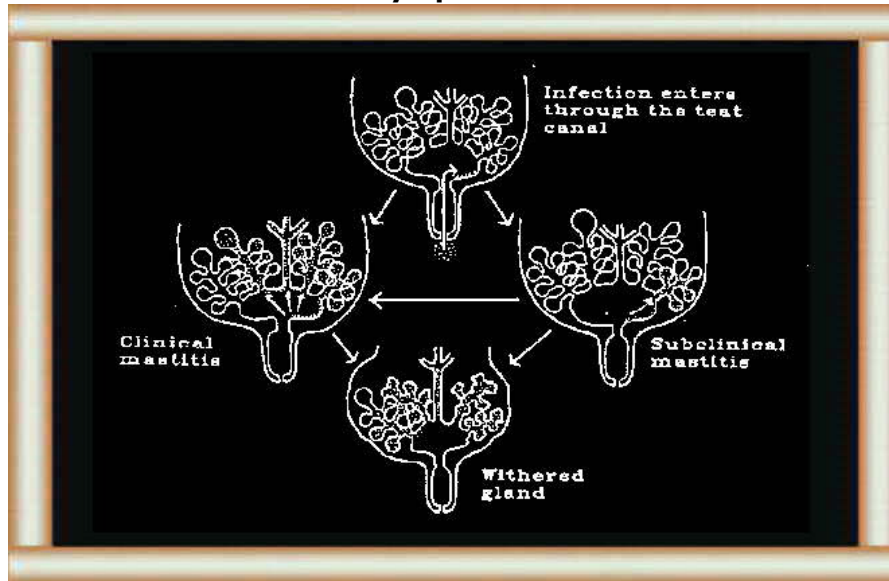
7 If your milk contains antibiotics from mastitis treatment, the centre will reject your milk and pay you no money.



8 Any kind of mastitis leads to lower milk production and therefore you get less money.

Definition of mastitis (9-12)

To make examination, diagnosis and treatment clear and uniform, mastitis cases can be grouped according to the character of symptoms.



Relationship between the amount of mammary gland tissue involved and the form of mastitis which results.

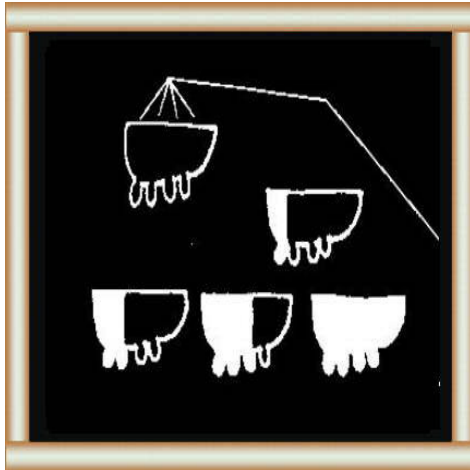
The different stages of mastitis are:

Acute mastitis (10-12)

The cow's condition is generally affected with fever and reduced feed intake.

The mammary gland is swollen, hot and painful and the milk is visibly changed.

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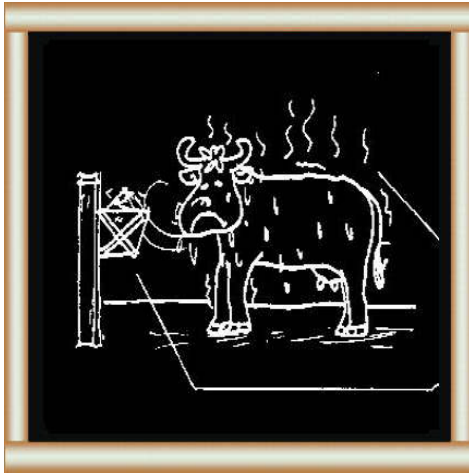


What is mastitis?

9 Inflammation of the mammary glands.

The udder consists of 4 glands.

Mastitis may infect 1, 2, 3 or all 4 glands.

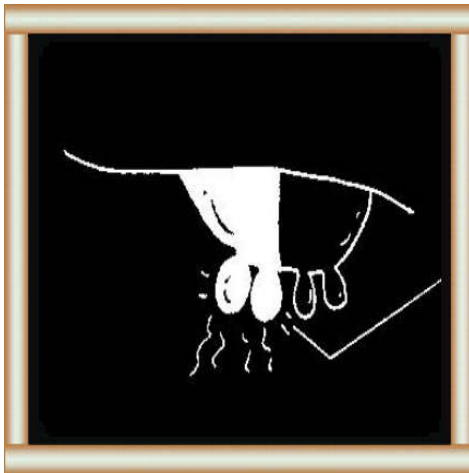


What are the types of mastitis?

Acute Mastitis

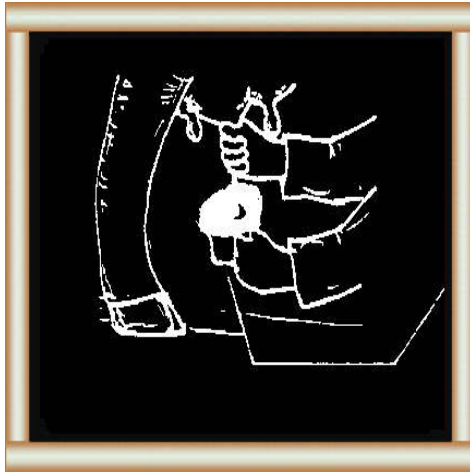
10 The cow shows general poor condition:

- high fever
- low food intake.



11 The udder is:

- hot
- swollen
- hard
- painful.



12 Milk in the strip cup is abnormal:

- watery and thin
- flecks and clots
- yellow or brownish colour.

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Chronic mastitis (13-16)

Chronic, subclinical mastitis ("hidden" mastitis)

General condition: udder and milk are not visibly changed. Only laboratory or cow side tests, for example CMT, show mastitis.

Chronic, mild mastitis

The udder may be slightly swollen and hard and the appearance of milk slightly abnormal. Paddle tests/ laboratory tests will confirm

diagnosis.

Chronic, indurative mastitis

The glands with mastitis cannot produce milk and gland tissue is replaced by hard, sometimes nodular, connective tissue. Clinical examination is sufficient to establish diagnosis. The milk producing ability of the gland will not return to normal.

Table 1 summarises key points in acute and clinical mastitis.

Remember that these categories of mastitis are not separate but all part of one disease: **Mastitis.**

The Strip Test (17-20)

You can do the strip test by stripping a few streams of milk onto the floor of the milking parlour or onto the boot: clean immediately afterwards. For hygienic reasons, it is better to use the strip cup.

Perform the strip test before each milking for the following reasons:

- It helps to detect clinical mastitis;
- It flushes out bacteria in the teat canal;
- It stimulates milk let-down.

Clean and sanitize the strip cup between each milking

Table 1:

Acute Mastitis		Chronic Mastitis		
		Hidden	Mild	With gland shrinkage (Indurative mastitis)
General Condition	high fever	satisfactory	satisfactory	satisfactory
	low food intake			
Mammary gland	swollen	normal	slightly:	hard
	hard		-hard	shrinks
	painful		-swollen	
			-painful	
Milk Texture	watery	normal	watery	(ceased production)
	thin			
	flecks			
	clots			
				(ceased)

Milk Colour	yellow	normal	normal or	production)
	brownish		slightly	
			chaned	
Milk Production	low	decreased	decreased	none
Diagnosis	Clinical examination: milk appearance	cow side test (for ext.CMT) laboratory tests	clinical, supported by cowside tests/lab tests	clinical examination



Chronic Mastitis
13 The cow shows satisfactory general condition.
But you know your cow has mastitis if you check your milk carefully.



14 There are 3 types of chronic mastitis.

Chronic hidden mastitis

Your cow and milk appear satisfactory.

But:

- you get less milk
- your milk is poor quality.

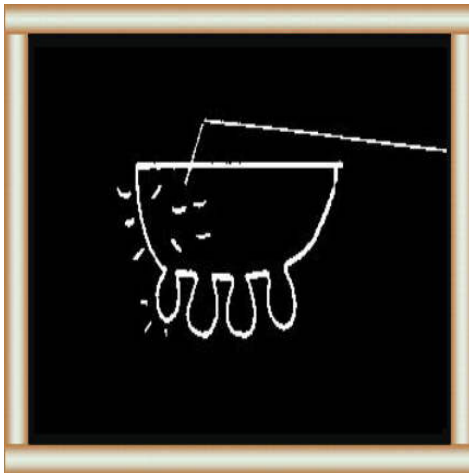


Chronic Mild Mastitis

15 Your cow appears satisfactory.

But:

- the glands are slightly hard, swollen, painful
- the milk is slightly abnormal, watery, discoloured.



Chronic Mastitis with Gland Shrinkage

16 Without treatment, scar tissue replaces gland tissue.

The gland becomes hard, shrinks and cannot produce milk any more.

The Strip Test (17-20)

You can do the strip test by stripping a few streams of milk onto the floor of the milking parlour or onto the boot: clean immediately afterwards. For hygienic reasons, it is better to use the strip cup.

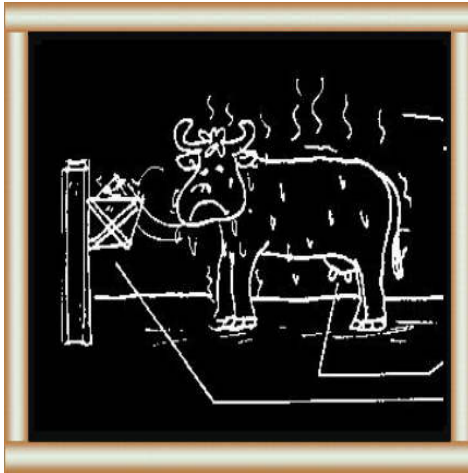
Perform the strip test before each milking for the following reasons:

- It helps to detect clinical mastitis;**
- It flushes out bacteria in the teat canal;**
- It stimulates milk let-down.**

Clean and sanitize the strip cup between each milking.

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[How can you know if your cow has mastitis?](#)

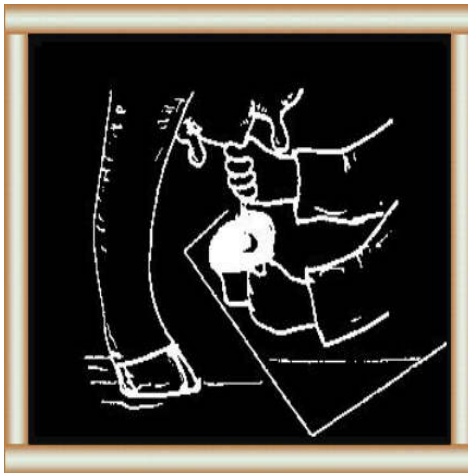


Cow

17 Check for fever and low food intake.

Udder

Check if glands are swollen, hard, red, hot, painful.



Strip Test

18 Before each milking:

**- milk a few streams of milk into the strip cup
(a small black container) from one teat only**



19

- spread the milk on the plate of the strip cup
- check carefully.



20 Clean the strip cup and then check milk from the next teat.

California Mastitis Test (CMT) (21-23)

You can use CMT to detect subclinical mastitis in the barn. You can also use it for a rough bulk-milk test.

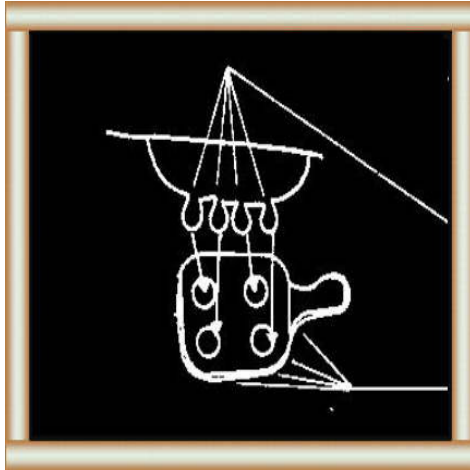
CMT measures the number of somatic cells present in the milk and a CMT-score is normally used as follows:

CMT Score	Somatic Cells (cells/millilitre)
0	100,000
trace (T)	300,000
1	900,000
2	2,700,000
3	8,100,000

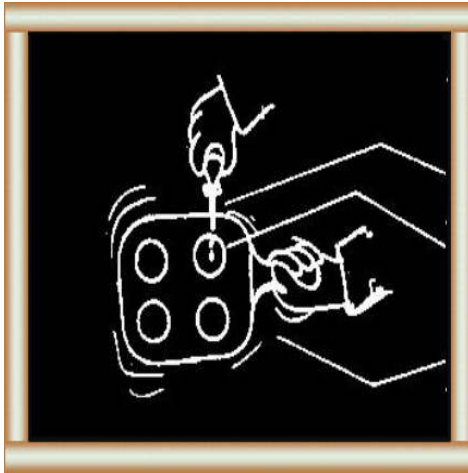
There are other tests similar to CMT which can be used in a similar way, such as the Whiteside Test or the Wisconsin Mastitis Test (WMT).

Remember that CMT and similar tests give a useful, but rough indication of somatic cells present, and only laboratory cell counts give exact figures.

The age of the cow, stage of lactation, teat or udder injury, stress, or other disease also affect the somatic cell count.

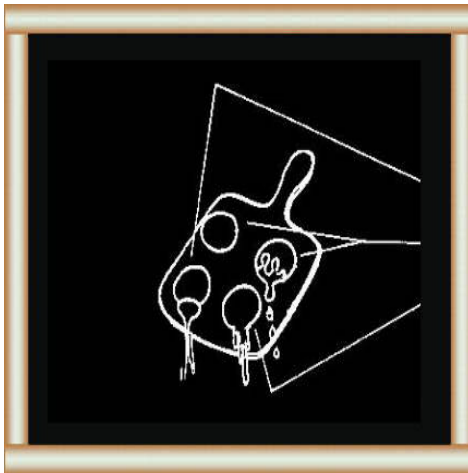


California Mastitis Test
21 Milk a few streams of milk from each teat
into a different hole in the paddle.



22 Add 2 ml of reagent to the foremilk in each hole.

Move the paddle gently.



23 Easy flow with no gel shows no mastitis.

Slow flow with some gel shows possible mastitis.

Stringy or lumpy milk shows certain mastitis.



Laboratory Tests

24 The tests show the number of cells and bacteria present in the milk.

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Agents causing mastitis (25-27)

Infection with bacteria or fungi is the usual cause of mastitis. The normal route of infection is through the teat canal and then through the mammary gland. Mastitis may also be part of general disease and affect other organs.

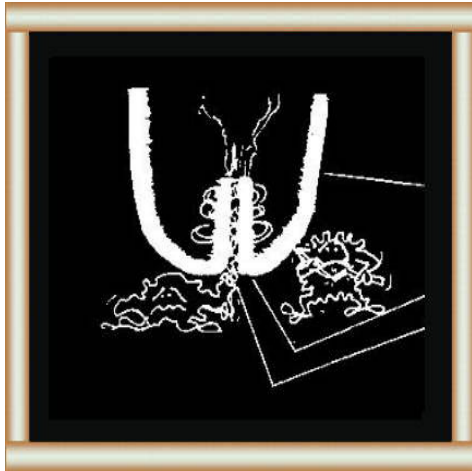
The most common bacteria to cause mastitis are *Staphylococcus aureus*, *Streptococcus agalactiae*, and other *Streptococcus* bacteria. Coliform bacteria, *Pseudomonas* and *Corynebacterium pyogenes* may also cause mastitis.

Streptococcus agalactiae needs to be in the cow udder to survive. Therefore, it is not difficult to eradicate if you treat all cows in the herd.

The other bacteria mentioned above can survive in the surroundings - in the barn, on milking tools, on hands etc. This means that general hygiene is an important part of mastitis control.

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Why do your cows get mastitis?



25 In healthy teats, few bacteria enter because:

- the skin protects against bacteria
- the teat opening is tight
- a waxy substance seals the opening.



26 If the teat is unhealthy, has a lesion, or is very dirty:
- many bacteria can enter



27
- the cow's system cannot protect it from the bacteria
- they increase in number and spread to other parts of the gland
- the cow gets mastitis.

Cows can also get mastitis because other diseases such as metritis, pneumonia, digestive problems or low nutrition, make them weak.

Treatment of mastitis (28-31)

Treat mastitis as soon as you diagnose it. Infusion of an antibiotic preparation into the teat canal is the normal treatment. In acute cases, systemic treatment may be necessary.

Note:

- Penicillin is the traditional antibiotic used, but *Staphylococcus* bacteria especially are resistant. If bacterial resistance is a problem, a milk sample (taken before treatment) should be sent to the laboratory for culture and antibiotic sensitivity testing.

You can buy a wide range of antibiotics prepared especially for udder infusion.

- Before infusion, clean, dry and disinfect (e.g. with alcohol) the teat.

- When infusing the udder, do not push the cannula of the syringe too far into the teat canal. This may damage the canal and cause further bacterial infection. Partial introduction (3-4 mm) into the teat opening gives much better treatment results.

How can you treat mastitis?



28 In any case of mastitis, call the veterinarian.



V2

29 He may take a sample of milk for testing



30

- inject antibiotics into the teat



31

- sometimes also inject antibiotics into the muscle or blood stream if the cow shows poor general condition.

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Drug residues (32-35)

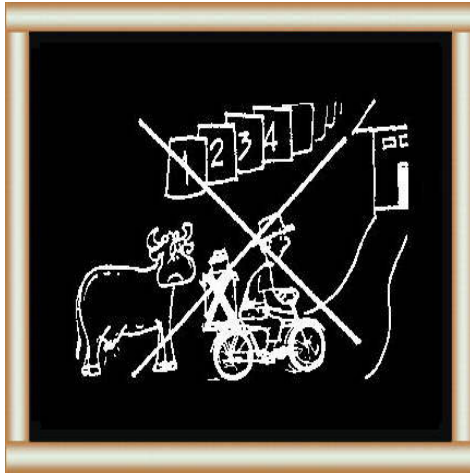
Some people are allergic to even small amounts of antibiotics in their food. They may even suffer an anaphylactic shock and resulting death from eating food with an antibiotic content: Penicillin especially has caused this kind of allergic reaction.

Because of this danger, you must observe withdrawal times for antibiotics strictly.

Discard milk from all 4 quarters from treated cows, even if you only infused one quarter.

Antibiotics deposited by the intramuscular or intravenous route, as food additive or deposited in the uterus, will also leave residues in both milk and meat.

In short, you must discard milk and not send animals for slaughter for a number of days after any antibiotic treatment, whether you infused through the teat canal or by other means. The length of withdrawal time is normally subject to the official regulations of each country.



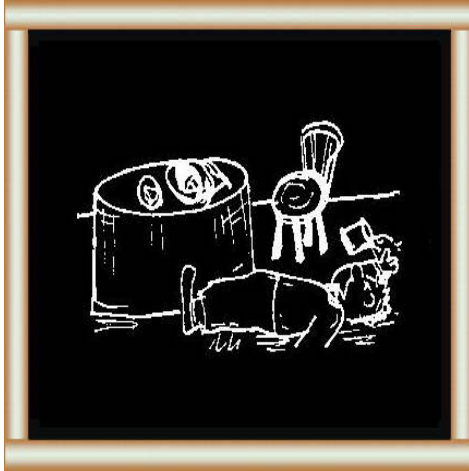
V2

32 After antibiotic treatment:

- do not send your milk to the collecting centre for some days
- ask your veterinarian when you can send your milk

33

- do not send your animal for slaughtering for some days
- consult your veterinarian about the length of time.



34 Some people may become sick after taking milk or meat which contains antibiotics.



35 Many countries have laws against delivering milk or meat which contain antibiotics.
You could be held responsible!

Clean milk utensils (38-39)

Contaminated milk is sometimes delivered to the dairy, even with recommended clean milking procedures.

Milking utensils that are not sufficiently clean may cause this.

You must:

- **thoroughly clean and disinfect milk cans, buckets and other utensils after use;**
- **keep them in a clean dust free place where they can dry properly.**

This place should never be a corner of the cow barn - even the cleanest cow barn houses lots of bacteria that will contaminate milking utensils - and later on the milk.

Storing of utensils in a clean, well ventilated place, after proper cleaning, is an essential point to remember, if good quality milk is to be delivered to the dairy plant.



Hygiene

Before milking

36 Always wash dirty buffalo after wallowing and your dairy cows if they get dirty.

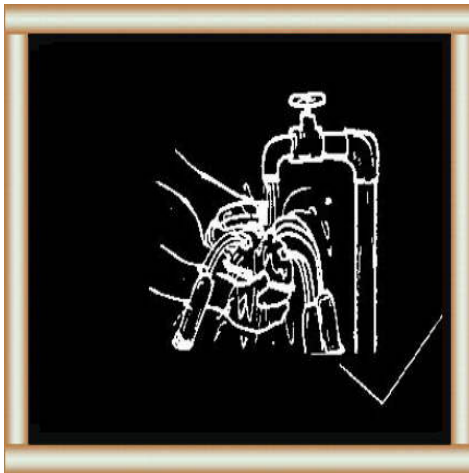


37 Clean anywhere your animals are likely to lay down.



Always:

**38 Clean your hands thoroughly before milking.
Rinse in disinfectant after washing.**

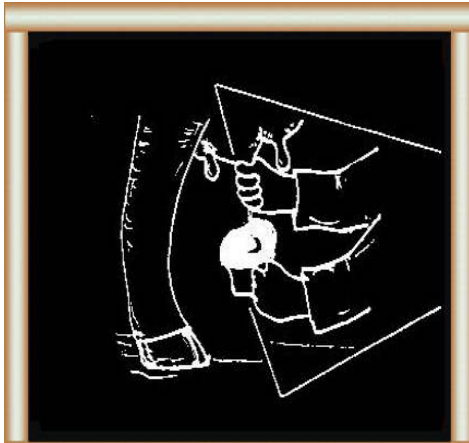


**39 If you use a milking machine;
- clean and disinfect it thoroughly after each milking
- make sure it works correctly.**

Teat dipping (40-42, 47)

Farmers often neglect teat dipping. They think that udder cleaning before milking is sufficient.

However, even the cleanest milking procedure cannot avoid bacteria on the teat after milking. You must dip the teat to make sure that these bacteria do not invade the teat canal and cause mastitis. You can only control mastitis in the herd if you also use teat dipping on every cow after every milking.



V2

40 Milk 2 or 3 streams of foremilk from each quarter into a strip cup:
- examine carefully.

After wallowing

41 Wash the teats in clean (or sanitised) running water.



**42 Dry the teats and udder with a disposable paper towel or clean, dry cloth.
Use only one cloth per cow.
If you cannot use only one cloth per cow, use only clean hands.**

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V2

During milking

43 Plan the order in which you milk your cows.

First, milk cows which do not have mastitis.

44 Secondly, milk cows with suspected mastitis.



45 Finally milk cows with mastitis.



46 Make sure milking is complete, especially when you do not let your calf suckle.

Dry cow treatment (50)

Many experiments have shown that the best time to treat subclinical mastitis is in the beginning of the dry period - that is: following the last milking. The reasons for recommending dry cow therapy are many.

- The cure rate of dry cow therapy is higher than the cure rate from treatment during lactation.**
- The number of new mastitis infections during the dry period are reduced.**
- If udder tissue has been damaged it has time to recover before next lactation.**
- The number of clinical mastitis cases at the beginning of next lactation is reduced.**
- Since the cow is dry, no milk is withdrawn because of antibiotic content.**

Some veterinarians advise treating all quarters of all cows at drying off. The advantage is that all infected glands are treated and testing for subclinical mastitis is not necessary.

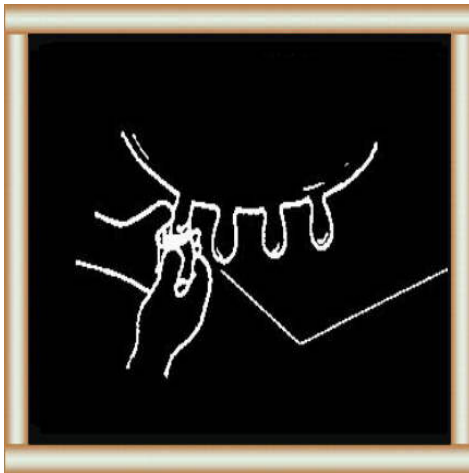
You can buy long acting antibiotic preparations, made for intramammary dry cow treatment. Never use these for treatment during lactation.



After milking

47 Dip the teats in disinfectant solution, for example:

- Hypochlorite solution (4% available chlorine)
- Chlorhexidine solution (0.5%)
- Iodophor solution (5,000 p.p.m.iodine).



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Early detection

48 Look out for changes in milk, udder and general condition of your cow.

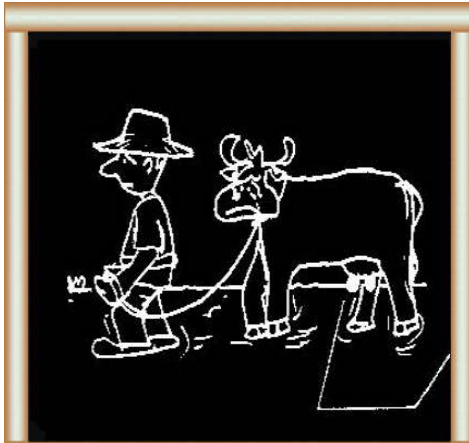
Early treatment

49 Treat all teat and udder wounds immediately.



**50 Treat all cows with visible mastitis (udder change) as soon as possible.
Treat cows with hidden mastitis at drying off**

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V2

51 Cull cows:

- with repeated mastitis (3-5 times during one lactation)
- which do not get treatments.

Checking

- 52 Check new animals for mastitis before mixing them with your old animals.**



Housing

53 Protect your cow from wounds.

Avoid:

- short boxes
- bad tyings.



54 Take away manure and dirt and clean the barn:

- mastitis bacteria breed in dirty places.

Records (58)

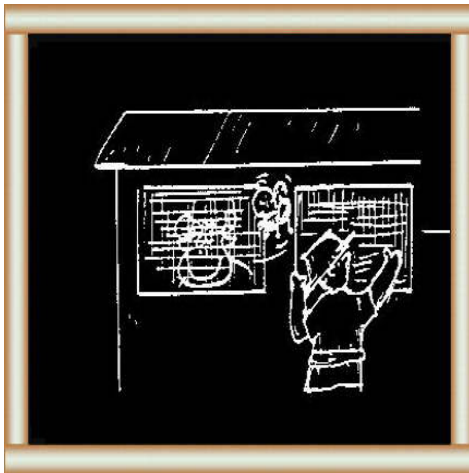
It is important to follow the occurrence of mastitis, not only for each cow, but also for the herd as a whole.

Keep records, giving information on:

- Identity of infected cows;**
- Time of infection;**
- Symptoms;**
- Treatment;**
- Cell counts (if available).**



55 Keep floors dry and provide bedding.



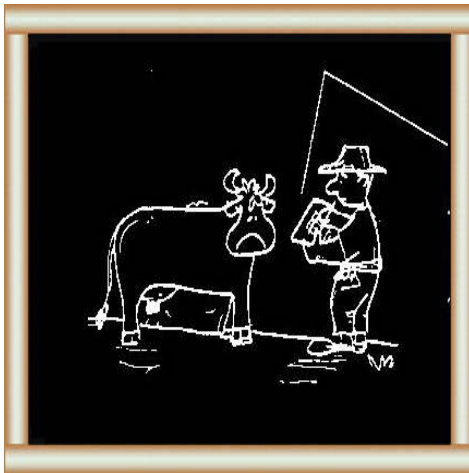
**56 Keep flies out e.g. with netting:
- flies carry mastitis bacteria.**



57 Avoid:

- untrimmed hooves
- slippery floors.

Your cow may damage her udder and get mastitis.



Records

58 Keep records of mastitis and treatment:

- this can help you find problem cows.

Preventing mastitis in buffalo (59-62)

The higher susceptibility of milking buffaloes to mastitis could be due to one of the following reasons.

- **The buffaloes predilection for water and muddy places.**
- **Very dirty and unhygienic milking places, sheds etc. The animals consistently sit in dirty places.**
- **The close contact between healthy and diseased animals in common grazing, wallowing places.**
- **Over-crowding in periurban herds and common milkers moving from place to place.**
- **Wrong milking procedures with unhygienic conditions. The teats are exposed to injury with inverted thumbs.**
- **Pendulous udder and large teats are liable to injury and infection.**
- **Unweaned calves can cause injury and create a focus for infection.**

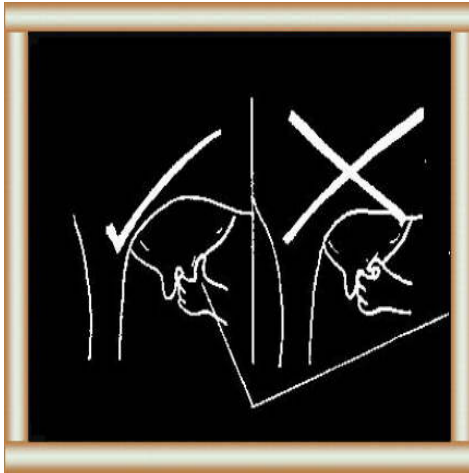
This observation is relevant in periurban herds where most of the milk must be sold rather than fed to calves. The calves when unable to feed cause injury due to biting, pulling and hitting the udder.

- **While taking out for grazing, wallowing and driving the animals are made to run. The large pendulous udder is liable to injury and infection.**

How can you prevent mastitis in buffalo?



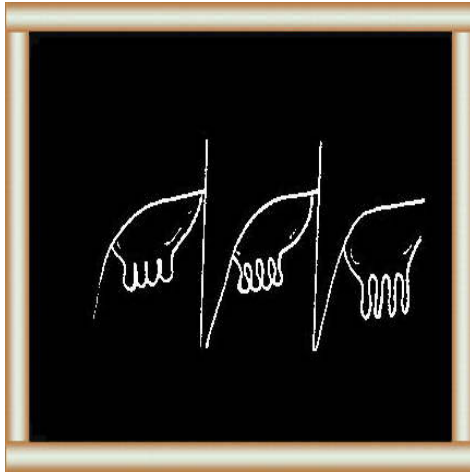
**59 Buffaloes like to wallow in water and muddy places.
This makes infection easier - wash them before milking.**



60 Milk your buffalo with your thumb up not down.



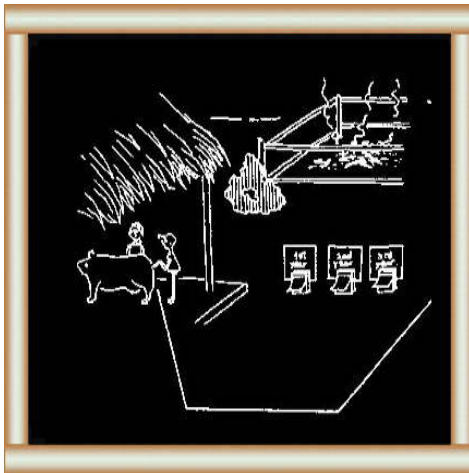
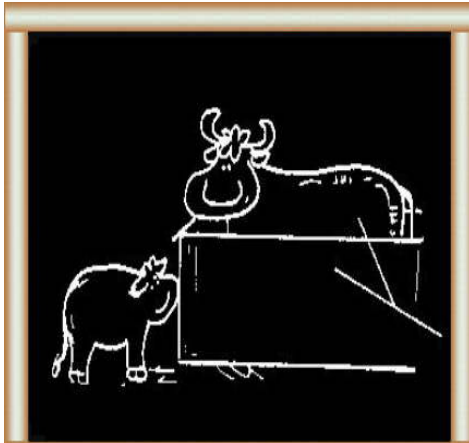
61 If your calves suckle, wean them early. Biting, pulling and hitting the udder causes damage which can lead to mastitis.



62 Your buffalo's udder and teats may be large.
Treat them gently and do not drive them with sticks or make them run.

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Important:
Injury or damage to your cow's udder leads to mastitis.
Protect your cow from injury and damage.



63 Your cow has high-risk periods for mastitis:
Early lactation
Just after calving discharge from the uterus
contains bacteria which can cause mastitis:
- keep your cow and box very clean.

Beginning and end of dry period

64

- dip teats 2 times a day for the first week
after drying off.

What do you know about mastitis?**Importance of mastitis**

Cows with mastitis cost you money because of:

- 1 Veterinary fees** (5)
- 2 Lower quality milk** (6-7)
- 3 Lower milk production** (8)

Mastitis

is Inflammation of the mammary glands (9)

1 Acute mastitis

- **Your cow**
- **high fever** (10)
- **low food intake**
- **hot, swollen, hard, painful udder** (11)
- **Your milk**
- **watery and thin**
- **flecks and clots**
- **yellow or brownish** (12)

2 Chronic mastitis

- **Chronic, hidden mastitis** (13)

- Your milk
- less [\(14\)](#)
- poor quality
- Chronic, mild mastitis
- Your cow
- slightly hard, swollen, painful udder [\(15\)](#)
- Your milk
- slightly abnormal, watery, discoloured
- Chronic mastitis, gland shrinkage
- Your cow
- hard, shrunken gland with scar tissue [\(16\)](#)
- Your milk
- no milk

Identification of mastitis

- 1 Your cow [\(17\)](#)
- 2 Strip test [\(18-20\)](#)
- 3 California Mastitis Test [\(21-23\)](#)
- 4 Laboratory Test [\(24\)](#)

Reasons for getting mastitis

- Bacteria enter teat when: [\(25-27\)](#)

- dirty
- unhealthy

Treatment

Your vet can:

1 Sample for tests ([28-29](#))

2 Inject antibiotics ([30-31](#))

Do not deliver milk or meat during or shortly after treatment with antibiotics.

Consult your extension worker ([32-35](#))

Prevention

You can prevent mastitis generally by:

1 Hygiene before milking ([36-42](#))

2 Planning the order of milking ([43-45](#))

3 Ensuring complete milking ([46](#))

4 Dipping teats after milking ([47](#))

5 Early detection of mastitis ([48](#))

6 Early treatment at the right time ([49-50](#))

7 Culling ([51](#))

8 Checking new animals before mixing ([52](#))

9 Good, clean housing	(53-57)
10 Keeping accurate records	(58)
You can prevent mastitis in buffalo by:	
11 Careful washing before milking	(59)
12 Correct milking technique	(60)
13 Early weaning	(61)
14 Gentle treatment	(62)
Danger periods for mastitis	
1 Just after calving	(63)
2 Beginning and end of the dry period	(64)

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Small-Scale Dairy Farming Manual

Volume 5

Husbandry Unit 10.6

PARASITES IN DAIRY CATTLE AND BUFFALO

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PARASITES IN DAIRY CATTLE AND BUFFALO

Husbandry Unit 10.6:

Technical Notes

Note: Numbers in brackets refer to illustrations in the Extension Materials.

Introduction

Parasites cause major losses of production in dairy cattle and buffalo. There are two main groups:

- Parasites which live inside the animal, for instance worms and flukes (internal parasites);**
- Parasites which live on the outside of the animal, for instance ticks and mites (external parasites).**

Under most farm conditions animals come into contact with parasites. As a result most animals have parasites.

Animals that grow up normally will get some resistance to parasites so the problem is biggest in young animals. However, certain parasites, such as the liver-fluke, may be a problem even in older, well-fed animals.

Animals can usually live with some parasites without any clear signs of disease. However, the presence of parasites decreases production (weight gain, milk yield, calvings). This means economic losses for the farmers.

To keep the number of parasites as low as possible the farmer has to:

- Manage his animals well (good hygiene, satisfactory nutrition, pasture rotation);**

- Treat animals against parasites at fixed intervals.

This will not kill all parasites present but will reduce the harm to the animals.

The variety of parasite species that can damage animals is enormous. However, depending on climate, environment, animals and management practices, some kinds of parasites will normally "out-number" the others in the various cattle areas.

For the field worker it is practical to consider the many kinds of parasites in groups, and in this text the following grouping has been made:

External parasites

**Lice, Ticks,
Mange mites, Flies**

Internal parasites

**Roundworms, Hookworms,
Lungworms, Eyeworms,
Tapeworms, Flukes,
Coccidia**

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Extension Materials

What should you know about parasites in dairy cattle and buffalo?



Why are parasites important and how do they affect your animals? (5-14)

1 Parasites can make:

- your animals sick or even die
- you lose money through lower production.

What are the signs of parasites? (15-16)



V2

2 There are many different signs of:

- internal parasites
- external parasites

How do parasites reproduce or move from one animal to another? (17-23)

3 Parasites can pass from one animal to another:

- directly
- through a third animal.



How can you prevent parasites and treat your animals? (24-38)

4 Consult your extension worker about:

- prevention
- treatment.

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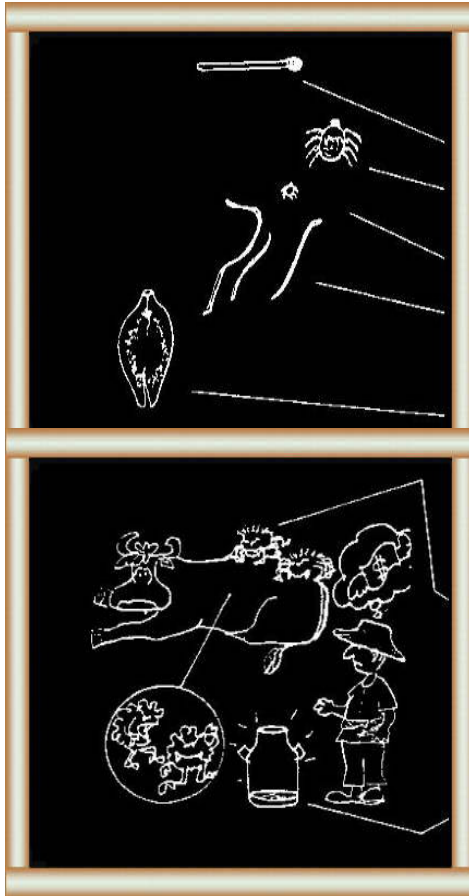
What are parasites?

5 Parasites are small animals which take their food from a larger animal.

Compare the sizes:

Match (2 1/2 cm long)

- tick



(Parasites outside a larger animal)

- mite

- worm

(Parasites inside a larger animal)

- fluke

Why are parasites important for you?

6 Parasites can make your cow sick, they can carry diseases and they can make you lose money through lower milk production.

Parasites in buffalo

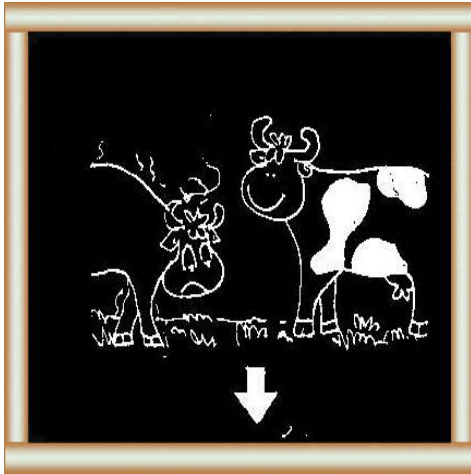
Many parasites are common in cattle and buffalo. Generally, however, buffalo suffer less from adverse effects. Owing to their habit of wallowing in rivers, water channels and even dirty water, there is a high risk of snail-borne helminths. In very dry weather, buffaloes are known to get severe attacks of sarcoptic mange. Young buffalo calves also suffer from neoscaris vitulorum infestations.

Transmission of diseases (8-10)

Some parasites cause serious damage by transmitting diseases from one animal to another. This is especially true for ticks which act as transmitters of the protozoan blood diseases Babesiosis, Theileriosis and Anaplasmosis.

These diseases cause great losses of animals in many areas of the world and are the reason for the continuous efforts made to reduce the severity of tick infestations in affected areas, particularly in the tropics.

How can parasites affect your dairy cattle and buffalo?



7

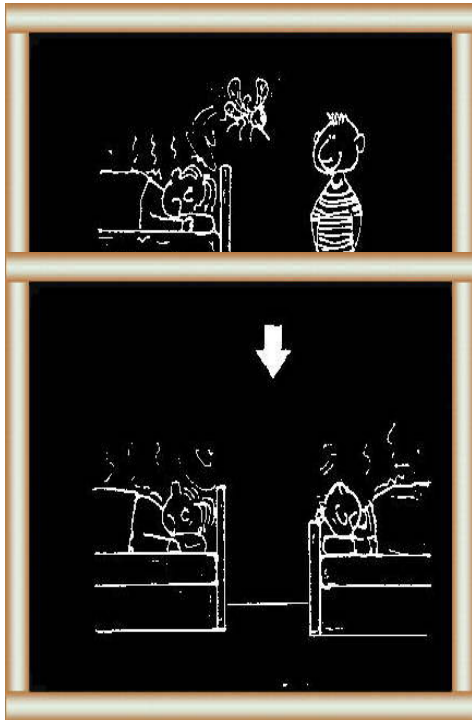
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8 Parasites can carry disease from one animal to another.

9 In the same way, a mosquito can carry malaria from one person to another.



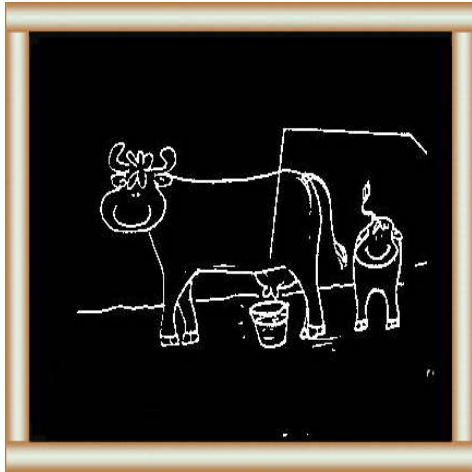
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Calves are sensitive to parasites for two main reasons: (13-14)

- They have not yet acquired any resistance against parasites commonly found in their environment. Cattle that have grown up in a certain area have normally developed some kind of resistance (immune response) against the parasites in the surroundings which they are constantly exposed to. Calves (and imported, adult animals) show much stronger disease symptoms from heavy parasite infections as they have had no time to build up an immune defense.
- Calves need all the nutrients they can get for growing. If they are fed normal rations but heavily infected by internal parasites, they cannot utilize the food given to them. Their growth may be reduced dramatically, and they easily become victims of a pneumonia or diarrhoea that may cause their death.

11 A cow without parasites:

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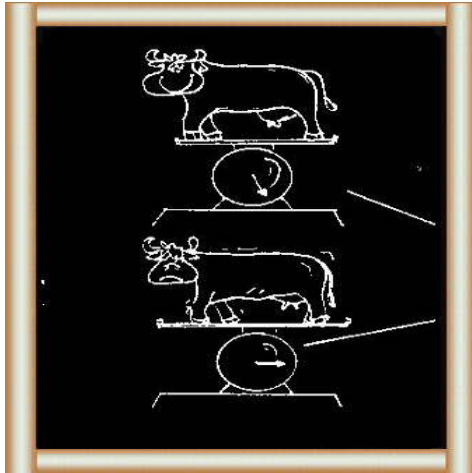
- produces more milk and more calves
- grows quicker.

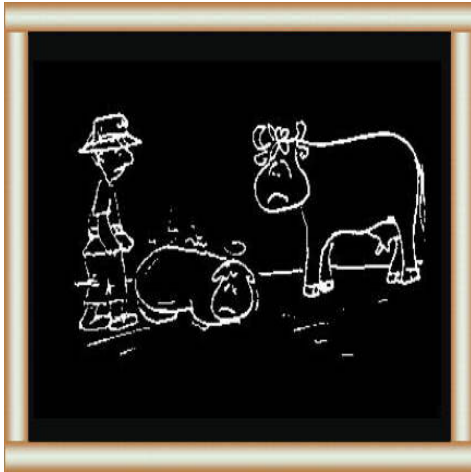


**12 Parasites cause irritation and disease and they steal food.
A cow with parasites produces less milk and fewer calves.**

**13 Calves with parasites gain less weight than healthy calves of the same age.
No parasites: normal weight.**

Parasites: lower weight.





14 Parasites are especially dangerous for young animals.

Signs of internal parasites (15)

Round worms, stomach/Intestine

The signs of disease depend on the type and density of worms present. Common signs of roundworms in the stomach or intestines are:

- loss of appetite**
- weight loss**
- diarrhoea and/or constipation**
- anaemia (pale mucous membranes)**
- swellings under the lower jaw ("Bottle Jaw") or along the belly**
- rough haircoat**
- general unthriftiness.**

One or more of these signs may be present.

Buffalo calves especially show severe infestation of a round worm *Ascaris Vitulorum*. The calves show dullness, poor appetite and colic with or without diarrhoea. The death rate is quite high and there could be complete closure of the intestinal tract. Secondary infection could also take place. The animals suffering from this disease emit a butyric acid odour on their breath.

The mortality rate can be quite high depending on the worm load.

Hook worms

Hook worms have also been reported from several buffalo producing countries.

Lungworms

Common signs of disease include:

- coughing**
- difficulty in breathing**
- reduced food intake**
- reduced milk yield.**

Young animals especially may show severe signs of disease.

Eyeworms

The signs of disease depend upon the severity:

- irritation and inflammation of the eye**
- ulcers and white scars in the eye.**

The worm can sometimes be seen by a close look at the eye.

Liverflukes

The signs of disease vary with the age and condition of the animal and the density of flukes present. Very often the signs are confused with signs of low nutrition or wrong management.

Signs include:

- poor appetite and resulting loss of weight and production**
- rough haircoat**
- pot-belly.**

Diarrhoea or constipation may also be present.

If animals are attacked by many flukes, more severe signs of disease, and in some cases even sudden deaths, may be seen. This, however, only happens rarely.

Rumenflukes

A large amount of rumenfluke larvae can sometimes cause diarrhoea and unthriftiness in young animals. Normally, however, the presence of rumenflukes causes no signs of disease in cattle.

Tapeworms

In humans tapeworms rarely cause serious signs of disease. In cattle the cysts can be seen in the meat after slaughtering. They look like small bladders (about 0.5 cm) in the muscles of the head, the heart and in other places.

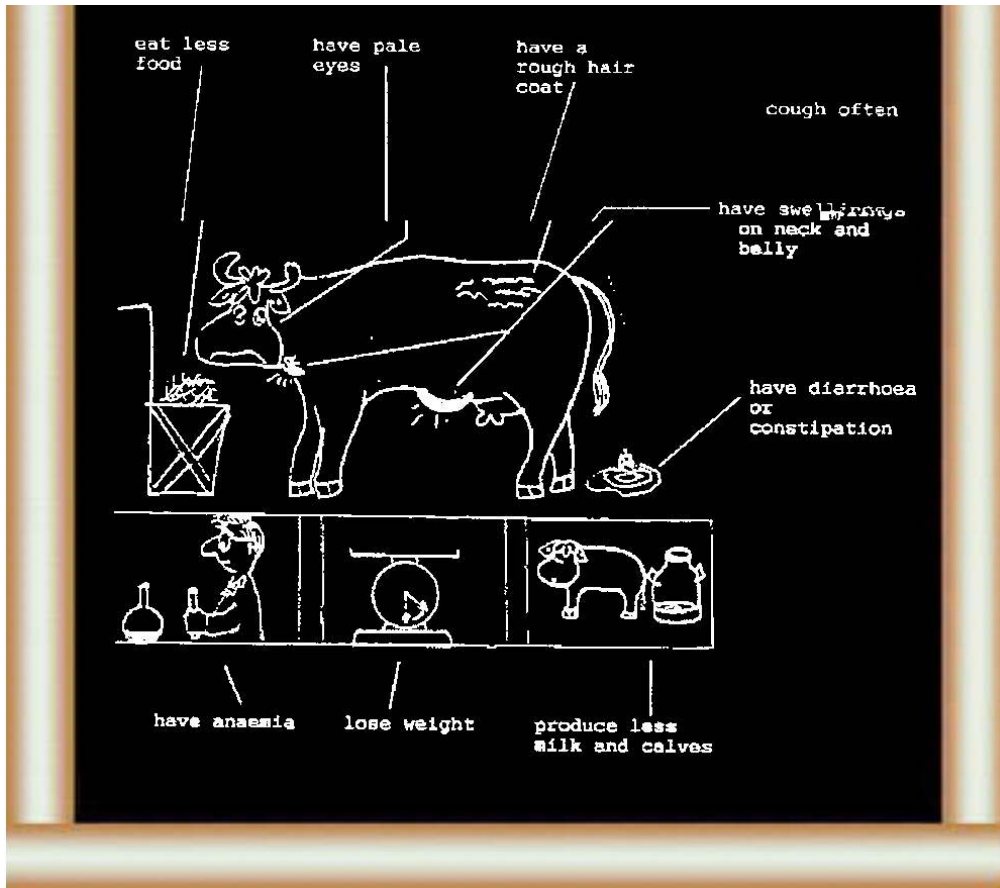
Coccidiosis

The condition is very commonly observed, especially in young growing calves, in several buffalo raising countries. The confinement of animals to dirty places will increase the intensity of the disease. Riverine buffalo suffer more from the disease. The characteristic symptoms are enteritis with liquid faeces mixed with blood.

What are the signs of parasites?

15 Animals with these signs may have parasites inside them:





Signs of external parasites (16)

Mange

The typical signs of disease are:

- loss of hair
- formation of scabs and crusts
- thick and folded skin
- itching.

Animals which are not in good condition will show more serious signs of disease than healthy, well-fed animals.

Sarcoptic mange (buffalo)

The disease is of frequent occurrence in Asia and South East Asia. The incidence of the disease increases during the very dry season although sporadic cases occur throughout the year. It is caused by *sarcoptes scabiei*.

The whole body may be affected but early lesions are observed on

the neck, brisket, axilla and inner surface of thigh. As the disease advances there is severe itching and scab formation. In severe cases there is thickening of skin and fold formation. The animal becomes very weak and young calves are known to die of mange.

The disease is diagnosed by examination of skin scrapings.

Psoroptic mange (buffalo)

The occurrence is low as compared to sarcoptic mange. The lesions produced are also on limited areas of the body, mostly near the horns.

Ticks

It is easy to see ticks on animals. Common places to find ticks are on the head, ears, the base of the tail, the udder and the dewlap. Several hundred ticks on one animal is not uncommon, but sometimes only a few are present.

Ticks can cause different kinds of disease in animals:

- tick-borne diseases (see Unit 10.1)**
- loss of condition**
- anaemia**
- inflammation and damage to the skin.**

Buffalo rarely suffer from tick infestation.

Lice (buffalo)

A disease called Pediculosis is caused by a blood sucking louse (Haematopinus tuberculatus). The infestation is observed almost everywhere the buffaloes are kept. The louse measures about 3.5 mm and is easily seen moving in the sparse hair. The eggs laid in large numbers attached to the hair are visible around the body. In young calves the number could be very large because of the thick hair coat.

In poorly managed animals the number of lice on the skin could also

be large.

Typical signs of disease are:

- **loss of condition**
- **stress and irritation**
- **poor appetite**



Figure 1: Biting louse (Trichdectes)

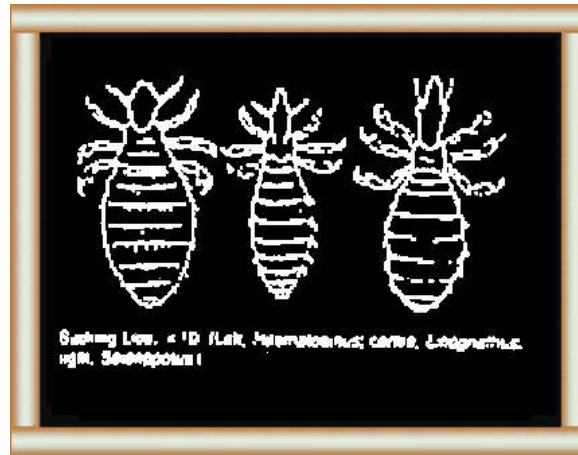


Figure 2: Sucking lice

(Left: Haematopinus, Centre: Linognathus, Right: Solenopotus)

Buffalo fly

The buffalo fly causes great distress to animals. It is found in most of the countries where buffaloes are raised. The fly is important during the monsoon and rains. Other than disturbing buffalo, the actual blood loss is small and other skin lesions are not produced in buffalo as observed in cattle.

Large black flies are also observed in buffalo populations. Their

number, however, is small in most of Asia and South East Asia.

Leeches (buffalo)

In Asia and South East Asia leeches of different types are known to live on buffalo populations. Animals pick them up from ponds and other wallowing places. Large infestations can cause dyspnoea. Most of the leeches stick to the outside of the body and suck blood but there are certain aquatic species which stick to the pharyngeal mucosa.

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16 Animals with these signs may have parasites on their bodies:

- red or damaged skin
- crusts and scabs
- itching
- loss of hair.

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Life cycle of internal parasites (17-29)

Roundworms in the stomach and intestines

Many different kinds of roundworm live as parasites in the stomach and intestines of cattle. Size, shape and effect on the animal varies. Figure 3 shows the common life cycle of this group of worms.

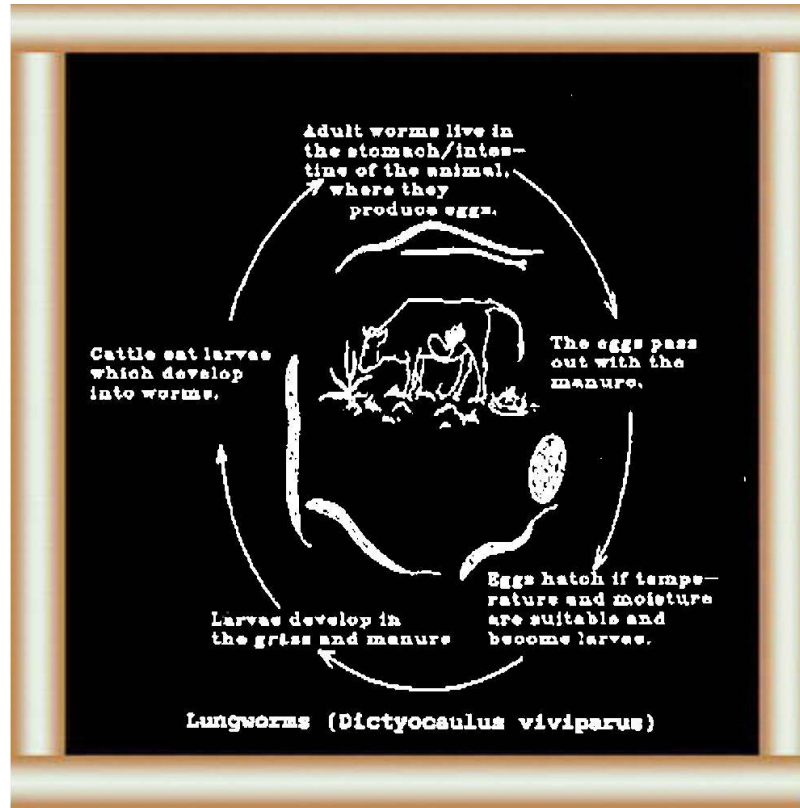


Figure 3: Life cycle of roundworms in stomach/intestines

Lungworms (*Dictyocaulus viviparus*)

Lungworms are white threadlike worms. They are about 1 mm thick and 6-8 mm long.



Figure 4: Life cycle of lungworms

Life cycle of eyeworms (Thelazia)

Female worms discharge larvae in the eyes of cattle. The larvae are eaten by flies and develop into infective larvae in the fly. The next time the fly ingests eye secretions, it deposits infective larvae in the eye, where they develop into adults.

Liverflukes (Fasciola hepatica)

Liverflukes are flat and leafshaped, 2-3 cm long and about 1 cm wide. They are grey-brown in colour.

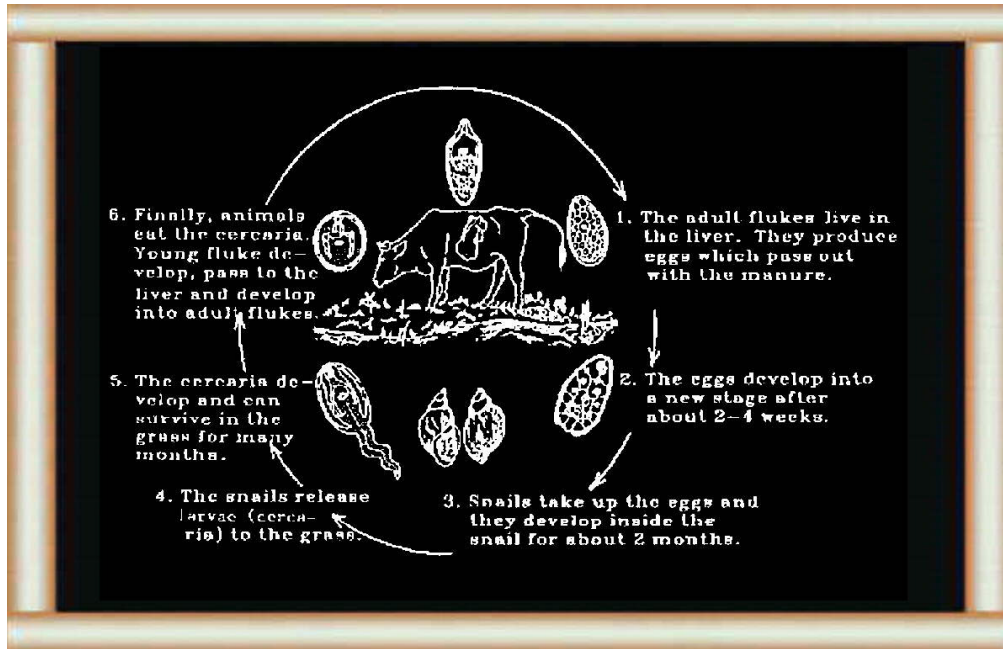


Figure 5 : Life cycle of liverflukes

Rumenflukes (Paramphistomum)

Another kind of fluke, rumenflukes, often live in the stomachs of ruminants. They are pearshaped, up to 1.5 cm long and have a bright red colour.

Tapeworms

Tapeworms are long, flat worms divided into segments. A large number of different tapeworms exist. Adult worms live in the intestines of human beings and animals.

One kind, Moniezia-tapeworms, live in the intestines of cattle. Normally they do not cause signs of disease. If animals, especially young stock, are not well-fed, they may show bad condition and digestive problems. In this case a number of drugs are available for treatment. Other kinds of tapeworms are of greater importance to people.

The Beef-tapeworm (Taenia Saginata)

The adult tapeworm lives in the intestines of people. However, before eggs can develop into adult worms they have to pass through cattle as part of their life cycle.

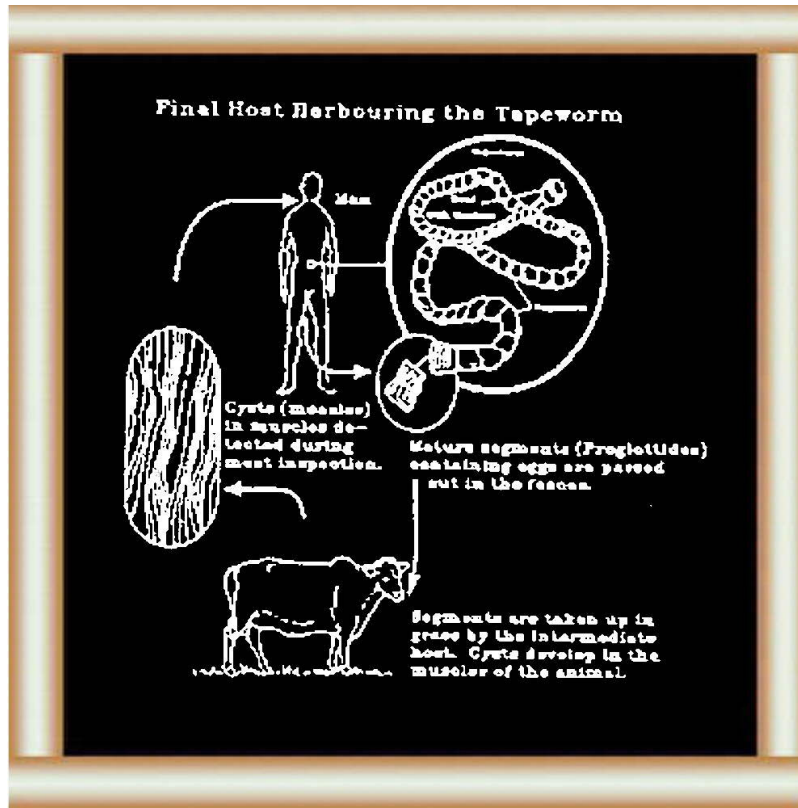


Figure 6: Life cycle of tapeworms

Segments from the tapeworms are passed out with the human faeces to the environment. If the segments are placed in an area where

cattle graze or drink, they may be taken up by the animals.

In cattle they will develop into bladders (called cysts) in the muscles. When meat containing cysts is eaten by human beings, the cysts develop into worms in the intestine.

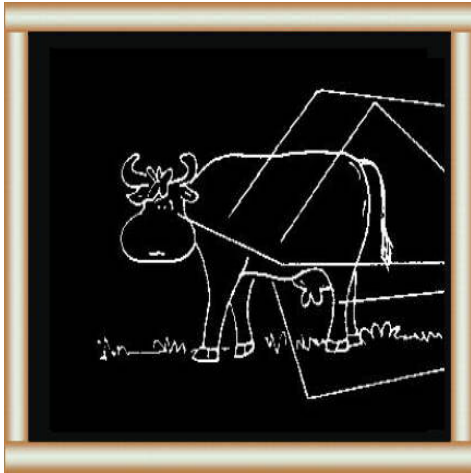
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How do parasites reproduce or move from one animal to another?

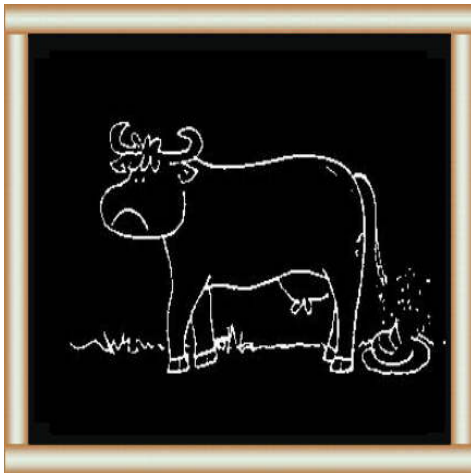


Parasites inside animals

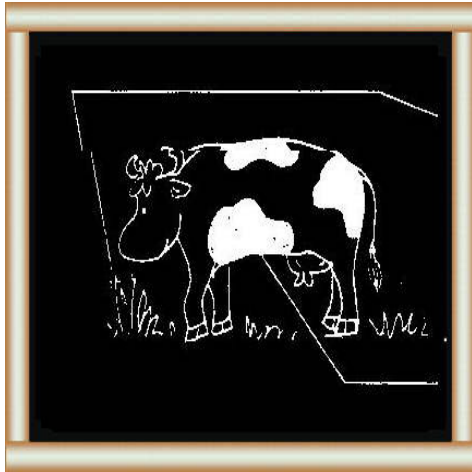
17 Parasites inside your animals live in a cycle.



**18 Worms can live in the intestines, the lungs, the eyes and the muscles.
Flukes can live in the liver or stomach.**



19 The eggs of the worms and flukes pass out of the animal in the manure.



20 Another animal eats the eggs with the grass and the worms or flukes grow inside this animal.

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Life cycle of external parasites (21-23)

Mange mites

There are different kinds of mange mites which can cause disease (mange). All are about 0.5 mm or less in size.

Life cycle

Mites live on the skin - either on the surface or burrowed down into

the skin. They lay eggs in the skin of cattle (or other animals) and the larvae hatch.

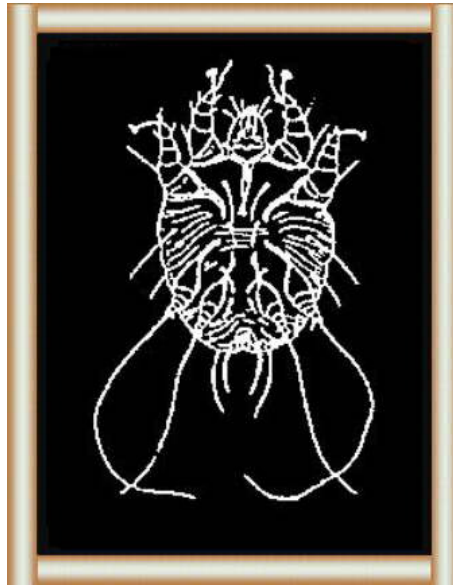


Figure 7: A Mite

Ticks

Ticks attach themselves to the skin and live from sucking blood.



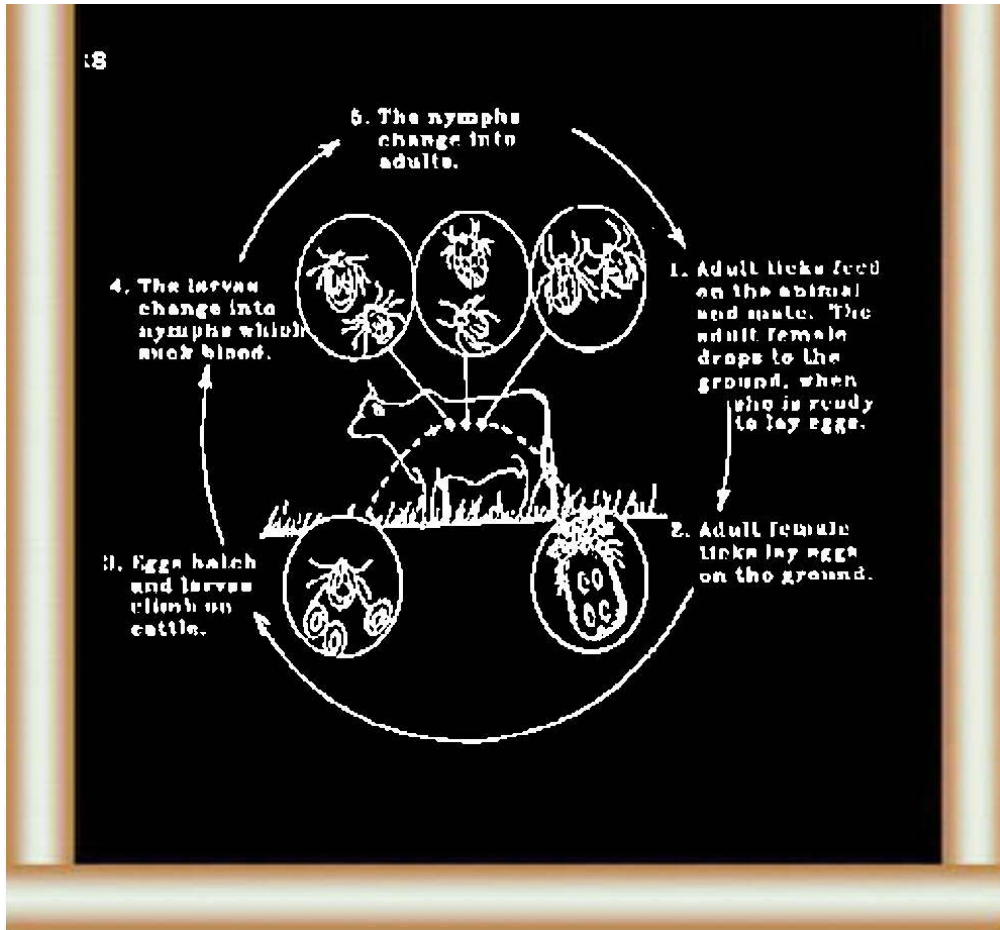


Figure 8: Life cycle of ticks

There are different kinds of ticks with different life cycles. All ticks have to go through 4 stages of development (egg, larva, nymph and adult).

For some kinds of ticks the development: larvae --->nymphs ---> adults must take place on 2 or 3 different animals, instead of only one as shown.

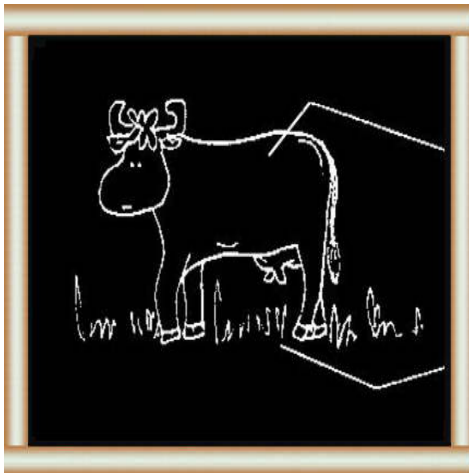
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[Parasites on animals](#)

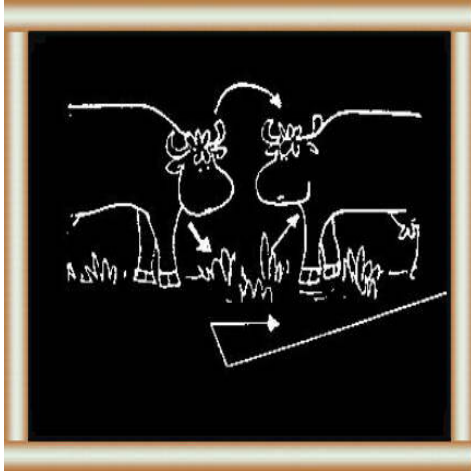


V2

21 Parasites on your animals also live in a cycle.



**22 Mites lay eggs on the animal.
Ticks lay eggs on the ground.**



23 When the eggs hatch, the parasites can move to other animals.

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Treatment and control of internal parasites (24-37)

Roundworms

There are many drugs which can be used against roundworms. Drugs which are given through the mouth and by injection are available. All animals in the herd should be treated - including those which show no signs of disease.

In order to avoid disease, treatment against worms should be given at regular intervals. Some other precautions can be taken by the farmer to avoid disease or make the parasite burden less serious:

- if possible pastures should be rotated**
- animals with severe signs of disease should be isolated from the rest of the herd**
- animals should not be fed from the ground**
- overstocking should be avoided.**

In buffalo, heavy infestation with *Neoseavis vitallorum* is observed in very young calves (at 2 weeks of age). First treatment is, therefore, given at 7 days of age in some areas.

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[How can you prevent parasites?](#)

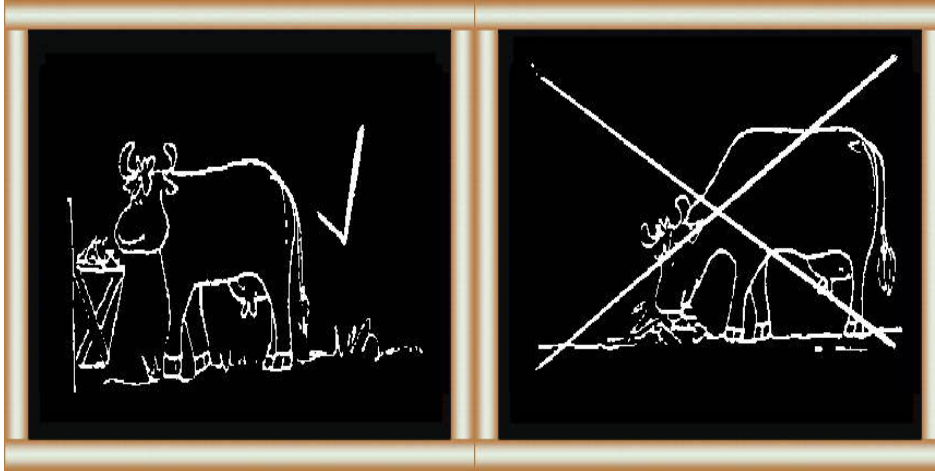


24 Clean your animals, your equipment and your stables regularly.



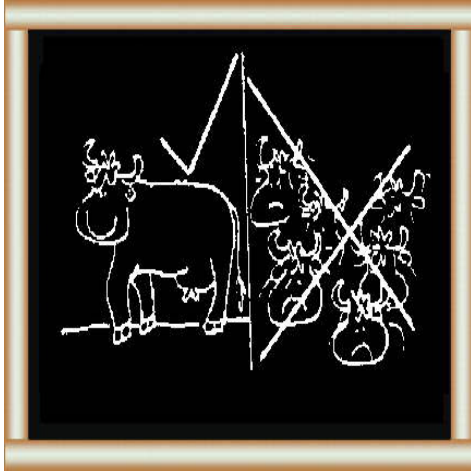
**25 Keep your animals in a shed or in a yard.
Cut and carry grass.
Keep insects away with nets.**

26 Do **not feed** animals from the **ground**.



27 Do **not crowd** animals together.

Give each one enough area.



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Lungworms

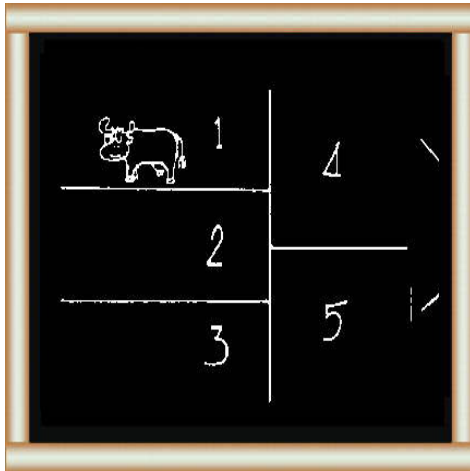
Animals should be removed from the pasture during treatment. Several drugs can be used for treatment; they can be given either through the mouth or by injection.

To avoid severe disease, animals should be treated against worms regularly. How often deworming should take place depends on the area in which the animals are on pasture.

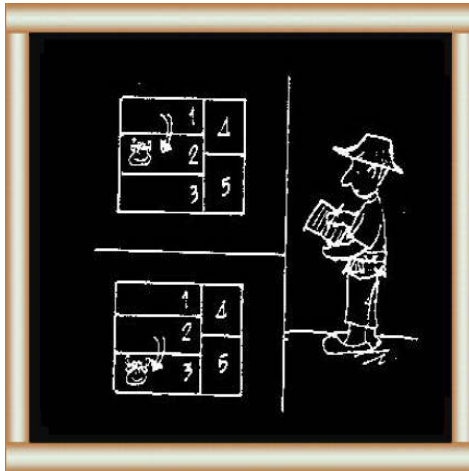
Eyeworms

The veterinarian can dope the eye and if possible remove the worms with forceps. Some drugs used against other worms are also effective. The inflammation is treated with antibiotic eye-ointments. In order to avoid disease the presence of flies should be reduced as much as possible.

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28 Make a plan of your farm and divide the pastures into sections.



29 Move your animals from one pasture to another regularly for grazing.
Most of the parasite eggs in section 1 die before your animals come back to graze.



30 Rotation is also good for your pasture.

Liverflukes

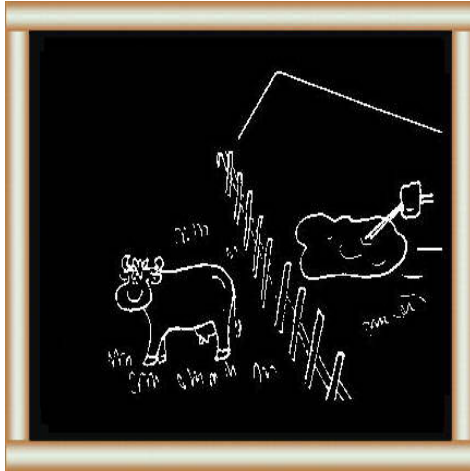
There are many drugs which have effect on both adult and young flukes. In each case, advice should be given by the local veterinarian or extension officer about choice of drug.

Regular treatment, normally twice a year, should also be given to avoid disease.

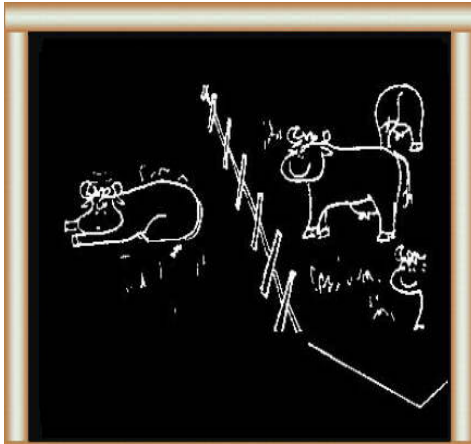
Animals should be kept away from wet areas where the snails necessary for the development of flukes may be present. Wet areas with many snails should be drained, since snails need wet areas to survive.

Tapeworms

A number of drugs can be used to treat the disease in man. The cysts in animals cannot be treated. In order to avoid disease, one should not eat raw or partly cooked meat. In fully cooked meat the cysts will be destroyed.



**31 Keep animals away from wet areas with snails which transmit flukes.
Drain wet areas with many snails.**



V2

32 Keep sick animals by themselves.



**33 Give the right medicine at the right time.
Consult your extension worker or
veterinarian.**

Treatment and control of external parasites (24-37)

Mites

The local veterinarian/extension officer should advise on drugs which can be used for treatment. Treatment is usually undertaken by dipping or washing.

Buildings and equipment should also be cleaned and disinfected, when animals are treated.

To avoid disease, sick animals should be kept isolated from healthy animals. Clean animals and clean and dry surroundings also help to avoid disease.

Ticks

Many drugs are available against ticks. They can be applied in different ways: dipping and spraying of animals are the most common, but hand-dressing may also be used.

Lice (buffalo)

Clipping of hair, dipping and spraying are all good ways to control lice.

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Can you treat your dairy cattle and buffalo for parasites?

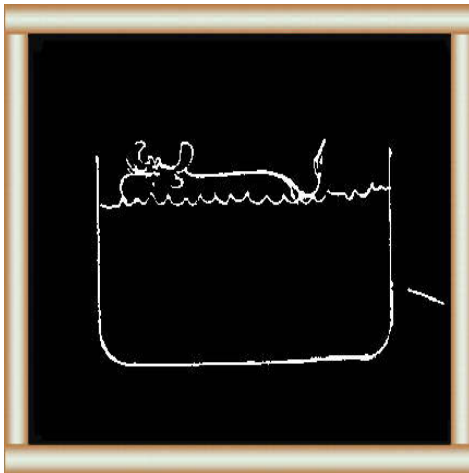


34 With care, you can reduce the number of parasites - but your animal may still have some.

Consult your extension worker about treatment



35 You can treat cattle for most parasites inside the body by feeding drugs, or by injection.



36 You can treat cattle for parasites on the body by spraying or dipping



37 and by clipping the hair and applying
coconut oil and kerosene.

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38 Control parasites - and you and your animals will be better off.



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What do you know about parasites in dairy cattle and buffalo?

Parasites and their effect on animals

1 Examples of parasites and sizes

(5)

2 Importance for:

(6)

- disease

- lost production

3 Parasites as the cause of:

- disease [\(8-10\)](#)
- irritation and low production [\(11\)](#)
- poor weight gain [\(13\)](#)
- danger for young animals [\(14\)](#)

Signs of parasites

- 1 Internal parasites** [\(15\)](#)
- 2 External parasites** [\(16\)](#)

Reproduction and transmission of parasites

- 1 Internal parasites** [\(17-20\)](#)
- 2 External parasites** [\(21-23\)](#)

Prevention of parasites

- 1 Hygiene** [\(24\)](#)
- 2 Buildings, grass cutting, fly prevention** [\(25\)](#)
- 3 Feeding** [\(26\)](#)
- 4 Avoid crowding** [\(27\)](#)
- 5 Rotation** [\(28-30\)](#)
- 6 Avoid wet areas** [\(31\)](#)
- 7 Isolation** [\(32\)](#)

8 Medication	(33)
Treatment for parasites	
1 Consult extension worker	(34)
2 Feeding, drugs and injections	(35)
3 Spraying and dipping	(36)
4 Clipping hair and applying coconut oil and kerosene	(37)

