



## PICTORIAL HANDBOOK FOR COMMUNITY ANIMAL HEALTH WORKERS

A SIMPLIFIED PICTORIAL ALBUM



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## Introduction

The Pictorial Album (Handbook) for Community Animal Health Workers is a simplified note that outlines topics relevant for training of CAHWs on basic veterinary clinical skills especially to those CAHWs with little or no knowledge. While being developed, the handbook was subjected to first and second review, field testing on its applicability and the Livestock stakeholder's workshop that was organized by WAR Child Canada in Wau State. The handbook will be used by CAHWs from Greater Bahr el Ghazal Region and South Sudan as a whole where significant. It is useful to be used by facilitators to prepare for training events as well as during training delivery. The guide only gives important topics on roles and responsibilities of the CAHW, clinical examination of livestock disease, useful methods of retraining animal, and major livestock diseases. The handbook outlines each disease, its cause, clinical signs, post-mortem signs, treatment, prevention and control. The other topics discussed are the drugs and dosage, handling of veterinary drugs and cost recovery as a concept. The handbook outlines about the vaccines and vaccination. It is more important to note that participatory principles should be observed for flexibility in actual delivery of training to prevail and the participants enjoy the time because that gives flexibility to the training environment and mood of participants. It is of a great hope that with handbook, the standards of services delivery at the lower level will be as adequate as possible and effective treatment is achieved.

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## PICTORIAL ALBUM (HANDBOOK) FOR COMMUNITY ANIMAL HEALTH WORKERS

### Abbreviations and Acronyms

AHA Animal Health Auxillaries  
CAHWs Community based Animal Health Workers  
CBPP Contagious Bovine Pleuro-Pneumonia  
CCPP Contagious Caprine Pleuro-Pneumonia  
FAO Food and Agriculture Organization  
FMD Foot and Mouth Disease  
LSD Lumpy Skin Disease  
NCD Newcastle Dsisease  
NGO Non Governmental Organization.  
PPR Pestes des Petits Ruminants  
VSF G: Veterinaires sans Frontieres  
WCC War Child Canada  
Ox-Fam GB  
WATAP  
UBG University og Bahr El Ghazal  
PCO Peace Corp Organization.  
WATAP

## Role of CAHWs / CBAHWs

### Primary roles:



*Figure 1: Community Dialogue*

- Create awareness about public health, veterinary public health and animal welfare in the community
- Promote good livestock management practices
- Warn the community in case of suspected outbreak of a disease





*Figure 2 CAHW controls animal movement during Outbreak*



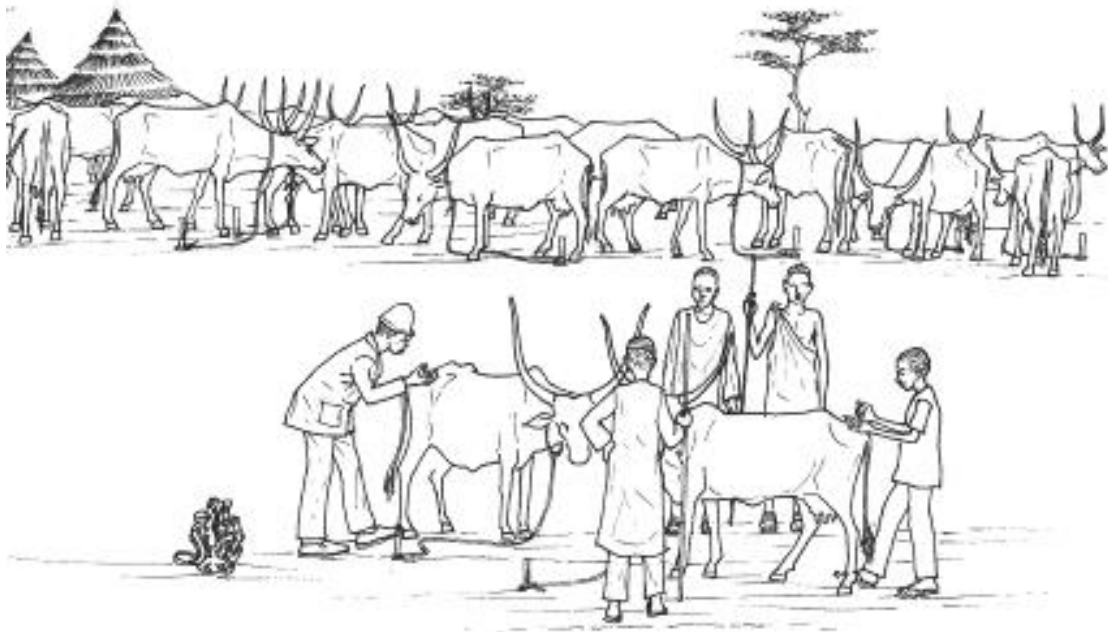
*Figure 3: CAHW Treat the clinical cases*



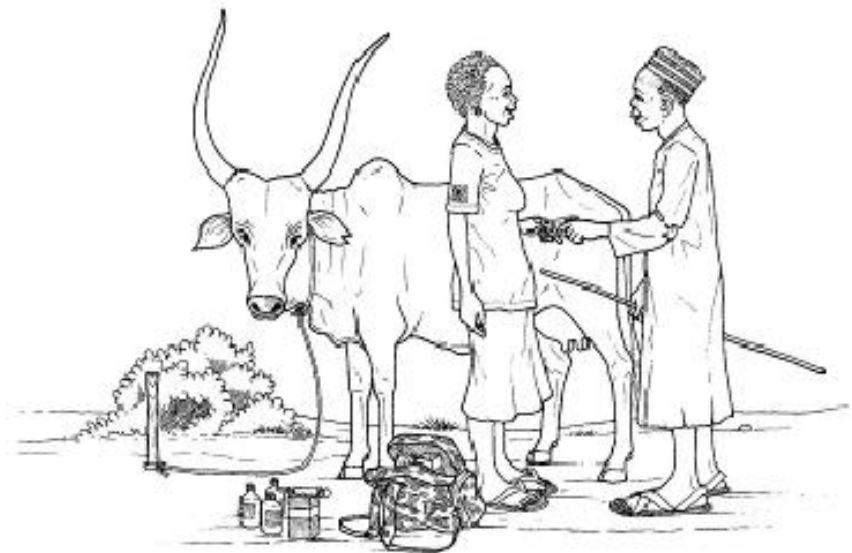
*Figure 4: CAHW Report the diseases to the Ministry*



*Figure 5: CAHW is the one to buy from Veterinary drugs shop and sell them to the community with instructions of use*

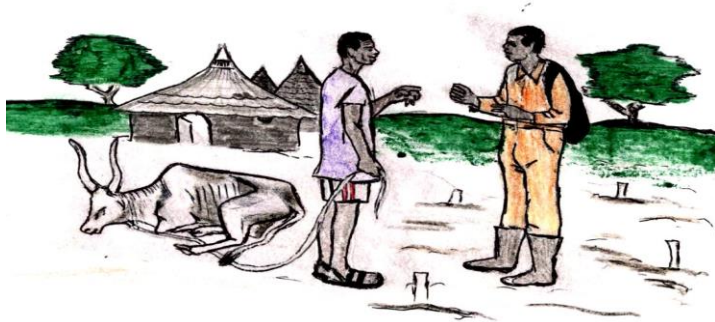


*Figure 6: CAHW carries out clinical examinations, isolate the sick ones and treats them*



*Figure 7: CAHW carry out his duty and sells drugs on case recover whether in cash or in Kind*

- Outreach to livestock owners and their animals
  - carry out clinical examination
  - treat sick animals
  - record the treatment and make necessary follow up
  - refer difficult cases to veterinarian
  - manage the activity on a cost-recovery basis
  - sell drugs to animal owners only with instructions of their use



*Figure 8: CAHW participate in disease investigation*

- Participate in outbreak investigation; take samples if necessary
- Surveillance: report occurrence of livestock diseases to the Ministry representatives



*Figure 9: CAHW Investigates diseases outbreak and report to the ministry*



Figure 10: A CAHW advises the community on appropriate carcass disposal method of burning



Figure 11: A CAHW advice the community on appropriate carcass disposal method by burying



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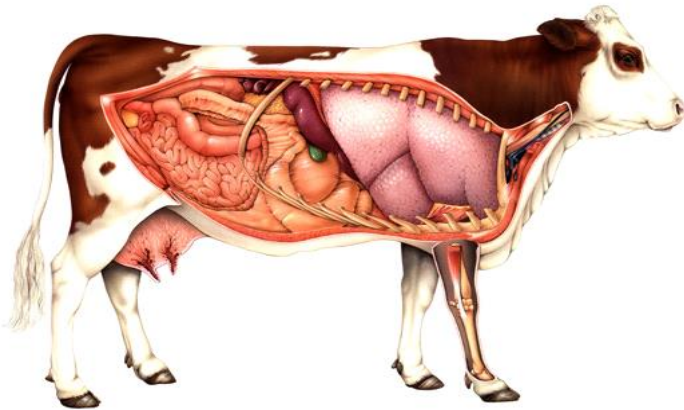


- Advise the community on appropriate carcass disposal
- Advice on livestock products safety (e.g. boiling the milk, condemnation of sick animals for human consumption)
  
- Participate in the vaccination campaigns
  - Mobilize the community
  - Vaccinate animals
- Keep drugs and tools away in a safe place, out of reach of children

### **CAHW position in the community and veterinary network**

- CAHW is selected by the community leaders
- CAHW is expected to actively offer his/her services and explain to the herder everything he/she is doing
  
- The CAHW is paid for his work on a cost-recovery basis, in cash or in kind
- The work of CAHW is supervised by representative of the Ministry; he or she is expected to deliver his/her treatment records to the Ministry representative several times per year

## BODY ORGANS AND FUNCTIONS



**Sensorial system;** eyes, ears, nose and skin

**Function:** seeing, hearing, smelling, feeling temperature or pain

**Disrupting factors:** infection by bacteria, mechanical injury, invasion by parasites

**Integumental system;** skin, hoofs, horns, hair

**Function:** protecting the body from environmental factors (temperature, sun, rain...), keeping the right temperature in the body, keeping the water and blood in the body

**Disrupting factors:** external parasites, injuries (burns, scratches and similar), lack of water in the body, burns

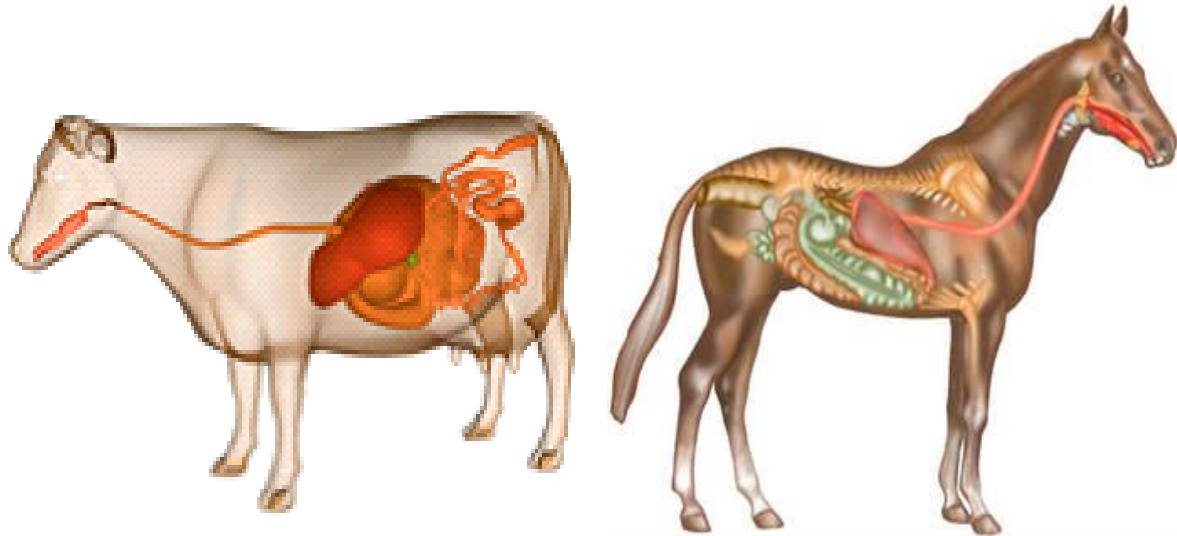
**Musculo-skeletal system;** muscles, bones and tendons



**Function:** movement, posture, protection of internal organs

**Disrupting factors:** injuries, fractures, infections, lack of vitamins and minerals

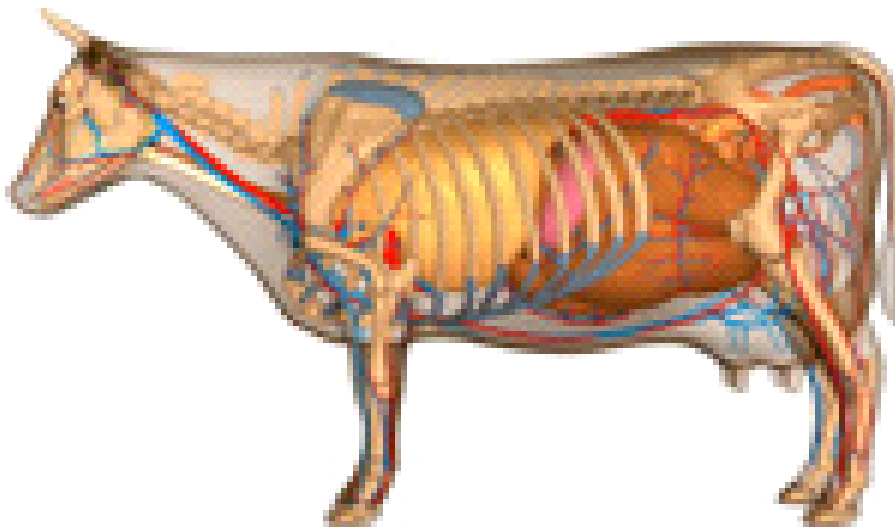
**Digestive system;** mouth esophagus, stomach, liver, gall bladder, intestine, pancreas, rectum



**Function:** eating and processing the food, excretion of substances which does not belong to the body

**Disrupting factors:** unclean water wrong feed lack of good feed, parasite, poisons

**Circulatory system;** heart, blood vessels, spleen



**Function:** Distribution of air and nutrition

**Disrupting factors:** lack of water in the body parasites lack of minerals



**Respiratory system;** Mouth/nose, windpipe, lungs



**Function:** breathing – distribution of air to organs

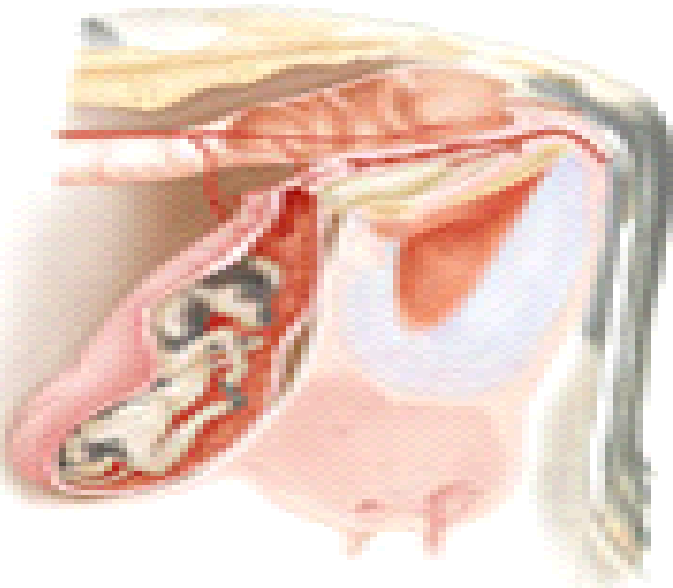
**Disrupting factors:** germs, smoke

**Urinary system;** kidneys, bladder

**Function:** excretion of urine and substances that does not belong to the body

**Disrupting factors:** lack of water in the body, bacteria

**Reproductive system;** testes and penis / ovaries, uterus, vagina and vulva

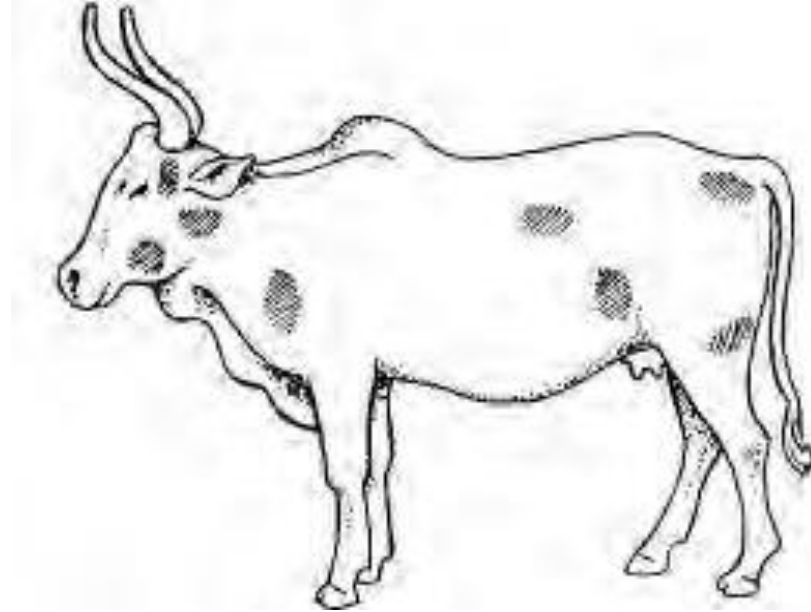


**Function:** production of offspring

**Disrupting factors:** bacteria, injuries

**Lymphatic system;** lymph nodes and spleen

**Function:** protection of the body from diseases



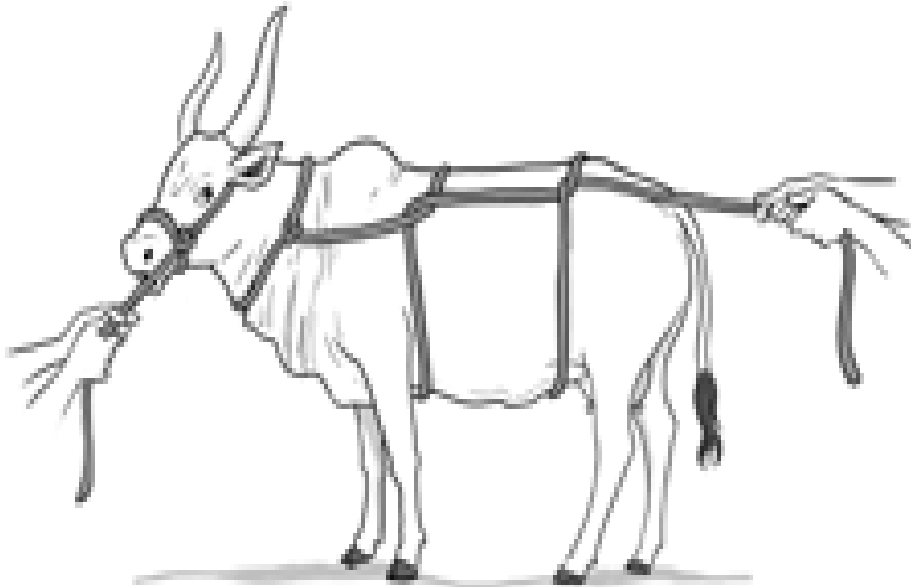
**Nervous system;** brain, spinal cord, nerves

**Function:** directing processes in the body, thinking, control of body functions

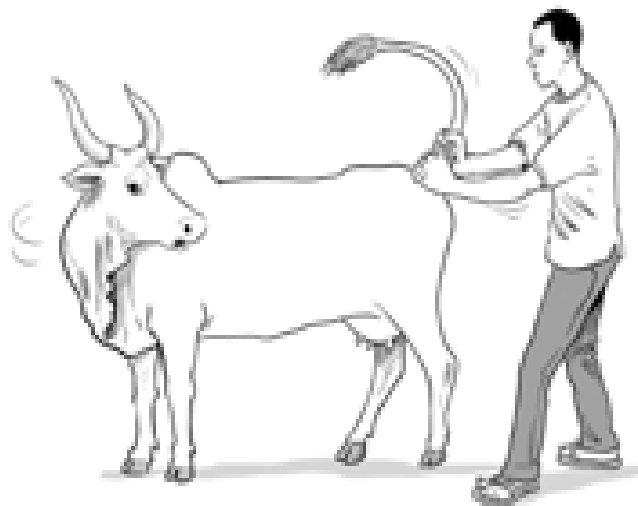
**Disrupting factors:** bacteria, parasites injuries of head or spine

## ANIMAL RESTRAIN

- Animal can be restrained by rope – pulling the rope by two people distracts the attention of the animal so that it remains still.



- Calmer animals can be restrained by twisting their tail. This also distracts the attention of the animal from the procedure performed.



- Hoof of cattle can be inspected by pulling it up by a rope.



- Animal is restrained in the crutch for vaccination, treatment and clinical examination

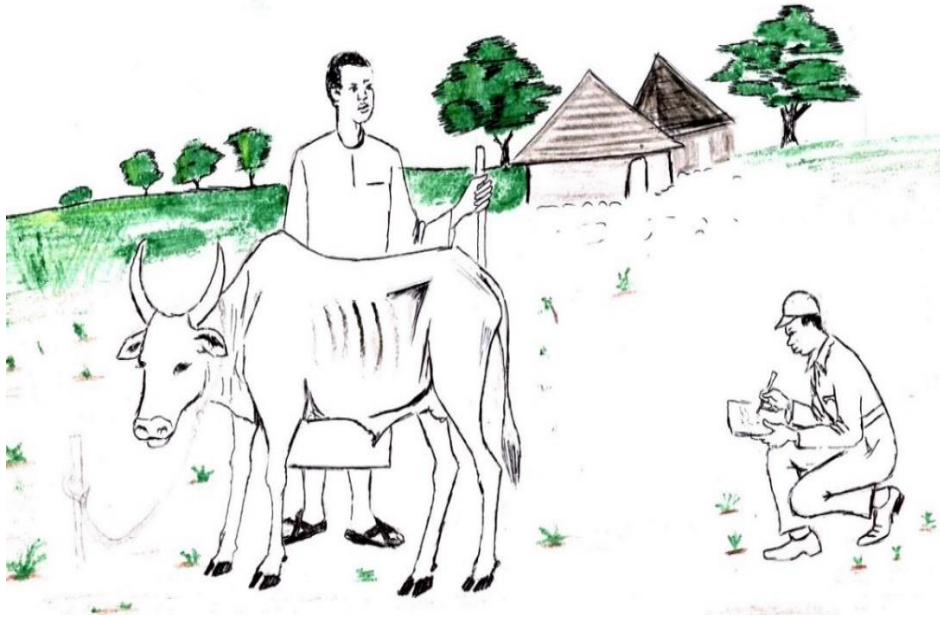


- Hoofs of sheep and goats can be inspected and trimmed by placing the animal in between the knees.



## CLINICAL EXAMINATION AND DIAGNOSIS

### 1. HISTORY TAKING



*Figure 12: CAHW Takes a proper case history to obtain proper diagnosis and eventual leads to proper treatment*

Ask the owner as much as possible, but be respectful to him!  
Consider the information provided by other animal owners  
Good history taking + good clinical examination = good diagnosis

### 2) EXAMINATION OF THE ENVIRONMENT

Grazing area: poisonous plants, swamps (presence of flukes), migration of animals from other areas... Sleeping area: clean or dirty?

### 3) EXAMINATION OF THE ANIMAL

**Observation from a distance – from the head to the tail**



body posture *Figure 13: CAHW Taking history of sickness must observe from distance*

- rumination
- overall body condition
- alertness

**Close inspection – examination of body organs,**

- taking of body temperature
- examination of membranes – eye, mouth
- examination of body openings – presence of excretions?
- examination of stomach and intestines – reaction to pressing on the stomach and back/spine

**BODY TEMPERATURE**



Thermometer is inserted in the rectum, after removing droppings  
Normal temperatures in animals:

|  |  |  |
|--|--|--|
| <ul style="list-style-type: none"><li>• cattle 37.5 – 39.5</li></ul> |  |  |
| <ul style="list-style-type: none"><li>• goat 38.5 – 40.5</li></ul>   |  |  |
| <ul style="list-style-type: none"><li>• sheep 38.5 – 40.0</li></ul>  |  |  |
| <ul style="list-style-type: none"><li>• donkey 37.5 – 39.0</li></ul> |  |  |
| <ul style="list-style-type: none"><li>• camel 35.0 – 41.0</li></ul>  |  |  |



**Interpretation:**

Higher than normal = animal has fever and is sick

Lower than normal = animal starving for food, lacking water, dying, poisoning, loosing blood

**Note!** The temperature of young animals is usually higher than adults!

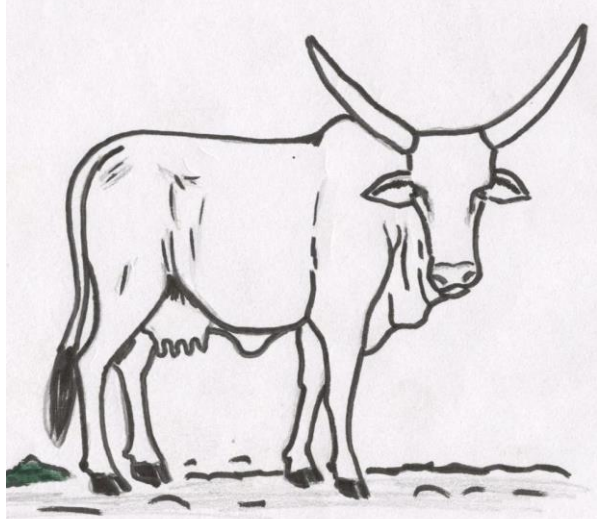

**DIAGNOSIS**

**Tentative diagnosis** – what is the most likely cause behind the symptoms observed?

**Differential diagnosis** – what are the other possible causes that could lead to similar symptoms? (e.g. general weakness can be caused by internal parasites, poor nutrition or chonical disease) – try to narrow the option through further questioning

**Final diagnosis** – the true cause is confirmed by laboratory analysis or by good reaction to proposed treatment

**HEALTHY AND UNHEALTHY ANIMALS**

| Healthy Animal   | Sick animal   |
|--|---|
|   |   |
| <ul style="list-style-type: none"> <li>• Continuous movement of the tail and ears, chasing away the flies</li> <li>• Normal urine and dung</li> <li>• Walk easily with normal steps</li> <li>• Good appetite and chewing the curd</li> </ul> | <ul style="list-style-type: none"> <li>• Rough dirty hair</li> <li>• Difficulty breathing (sounds,cough)</li> <li>• Ears flopping and rarely move</li> <li>• Eyes sunken with discharge</li> <li>• Muzzle dry with discharge</li> </ul> |

|   |  |
|---|--|
| <ul style="list-style-type: none"> <li>• Good production of milk of normal colour and taste</li> <li>• Smooth shiny hair, smooth skin</li> <li>• Normal breathing frequency</li> <li>• Erect ears</li> <li>• Open bright eyes</li> <li>• Cold moist muzzle</li> <li>• Alert and active</li> </ul> | <ul style="list-style-type: none"> <li>• Lameness, stiffness, reluctance to move or aggressive, crazy behavior.</li> <li>• Change of color and consistency of urine and dung</li> <li>• Reduced appetite and no chewing</li> <li>• Rapid drop in milk production, milk changes consistency and color</li> <li>• Dull and lazy attitude, unaware of sharp sounds</li> </ul> |
|---|--|

## CAUSES OF DISEASES

How does an animal become sick?

### Infectious diseases

- caused by small germs; viruses, bacteria or parasites, commonly called “causative agents”



VIRUSES are the smallest living being on earth, they are not visible by our eyes, only by a large microscope

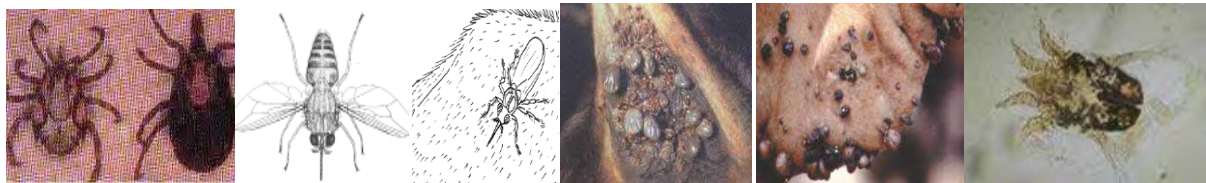
E.g Viral diseases: PPR, FMD, goat pox, lumpy skin disease or rinderpest



BACTERIA is very small, visible only by microscope

E.g Bacterial diseases: brucellosis, CBPP, CCPP, Anthrax, HS, BQ

PARASITE is very small, some of them are visible by eye, some only by microscope



ECTOPARASITES live on the skin of animals

E.g Mange, lice, ticks and similar



ENDOPARASITES live in the blood, gut or internal organs of animals  
E.g Parasitic diseases: trypanosomiasis, liver flukes or gut worms

*Viruses and bacteria often act in one animal together – virus opens door for bacteria to enter and cause more damage. This is called secondary bacterial infection.*

## Non-infectious diseases

These are diseases caused by environment / poor management



POISONING results from ingestion of toxic substances – some plants, fuel, overdosing of drugs, human food and other



POOR FEED can lead to lack of some important substances such as minerals or vitamins



**FOREIGN BODY** can happen when animals eat plastic, wood or other things which are not digested



**WOUNDS** are usually caused by sharp objects (wire, knife, tight rope and similar)

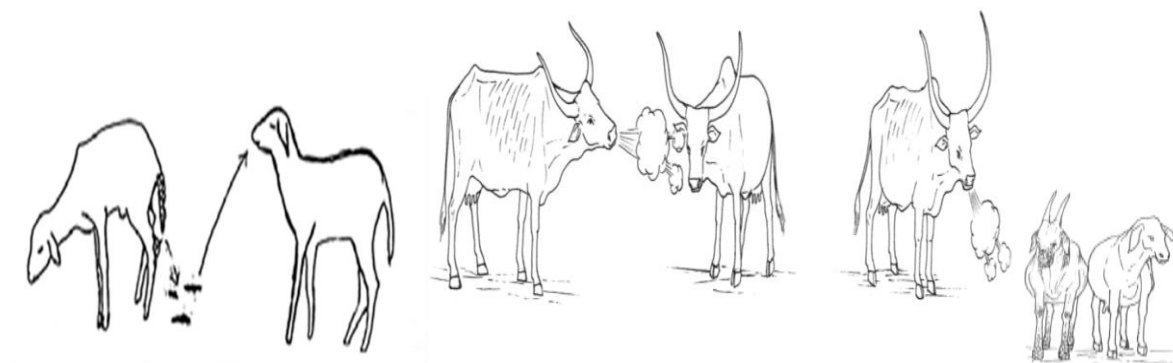


**BURNS** are caused by fire or boiling water

## DISEASE TRANSMISSION

How are diseases transmitted between animals?

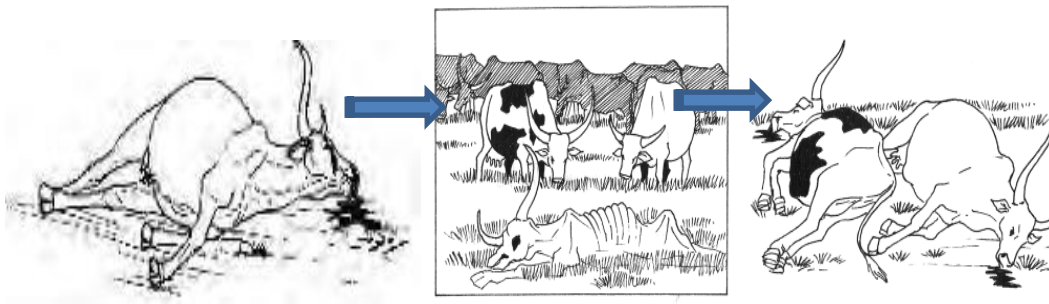
### Direct transmission



- need of close contact between animals
  - causative agent travels directly from one animal to another
  - droplets of water, saliva, urine, faeces or placenta can transport the agent
  - skin bacteria and parasites may directly change their host when two animals touch each other
- e.g example: CBPP and Mange respectively
- Blood

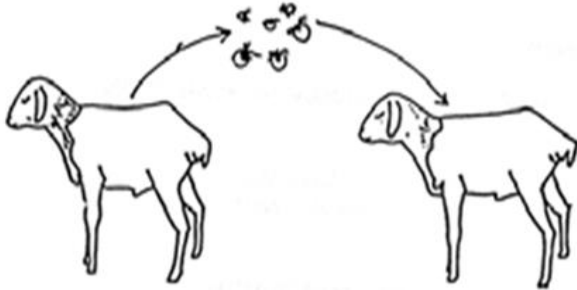
### Indirect transmission

- no need of close contact between animals
- a) *through non-living objects*



- causative agent is shed by the sick animal in the soil or water e.g Anthrax, CBPP, CCPP, BQ
- healthy animal picks up the agent when grazing or drinking water e.g example: gut worms


*b) through parasites*



- external parasites like ticks and tsetse flies can transport the agents of diseases example: trypanosomiasis, lumpy skin disease

## IMPORTANT DISEASES OF LIVESTOCK

### ANTHRAX

Cause:  bacteria *Bacillus anthracis* – very strong bacteria which can stay in the soil for long time (years)

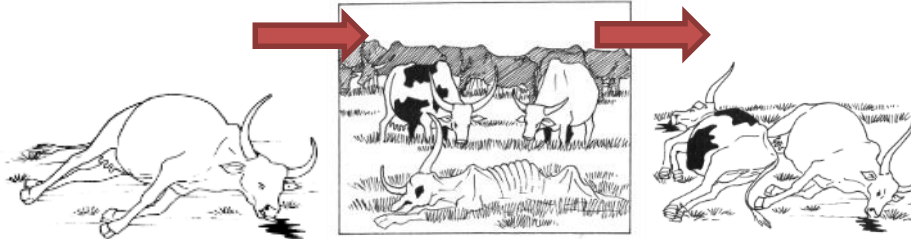
#### Clinical signs:



*Figure 14: Animal found dead with symptoms similar to Anthrax should be immediately reported to authorities*

- sudden onset and fast progression of symptoms
- reluctant to move or circling around
- high fever
- dark membranes
- diarrhea with blood
- sudden death

**Transmission:**



Bacteria stays in the ground – animals get infected when grazing in the spot

**Treatment:**



Bacteria can be killed by penicillin but However fast progression of the diseases usually disables treatment

**Transmission to Human:**

Disease transmissible to humans(zoonotic) !!!!!

People might get infected when touching the sick or dead animals or consuming their products –

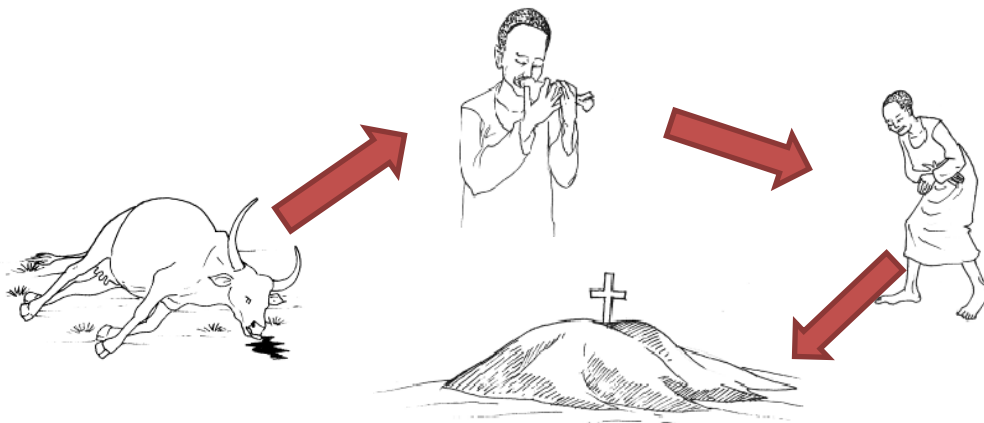


Figure 15: Animal with similar signs to anthrax should not be eaten or left to



## Prevention

DO NOT OPEN A CARCASS OF SUSPECTED ANTHRAX!!



*Figure 16: CAHW should be consulted for the appropriate carcass disposal method*


Dead animals shall be burned or buried deep in the ground

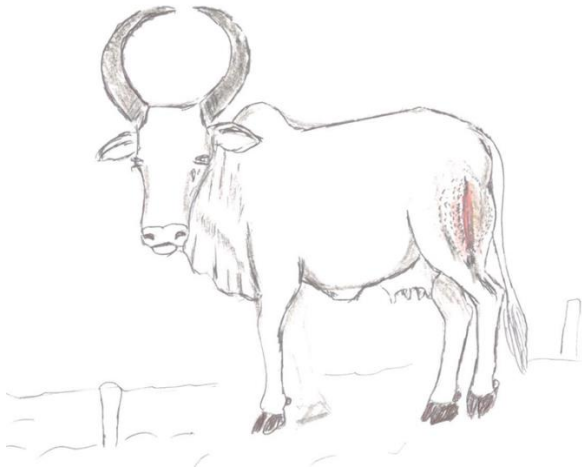


Yearly vaccination is the only effective prevention.

**IMPORTANT:** Anthrax shall be immediately reported to the nearby Veterinary Office!

## BLACK QUARTER (Blackleg)

Cause:  bacteria *Clostridium Chaveui* which stays in soil

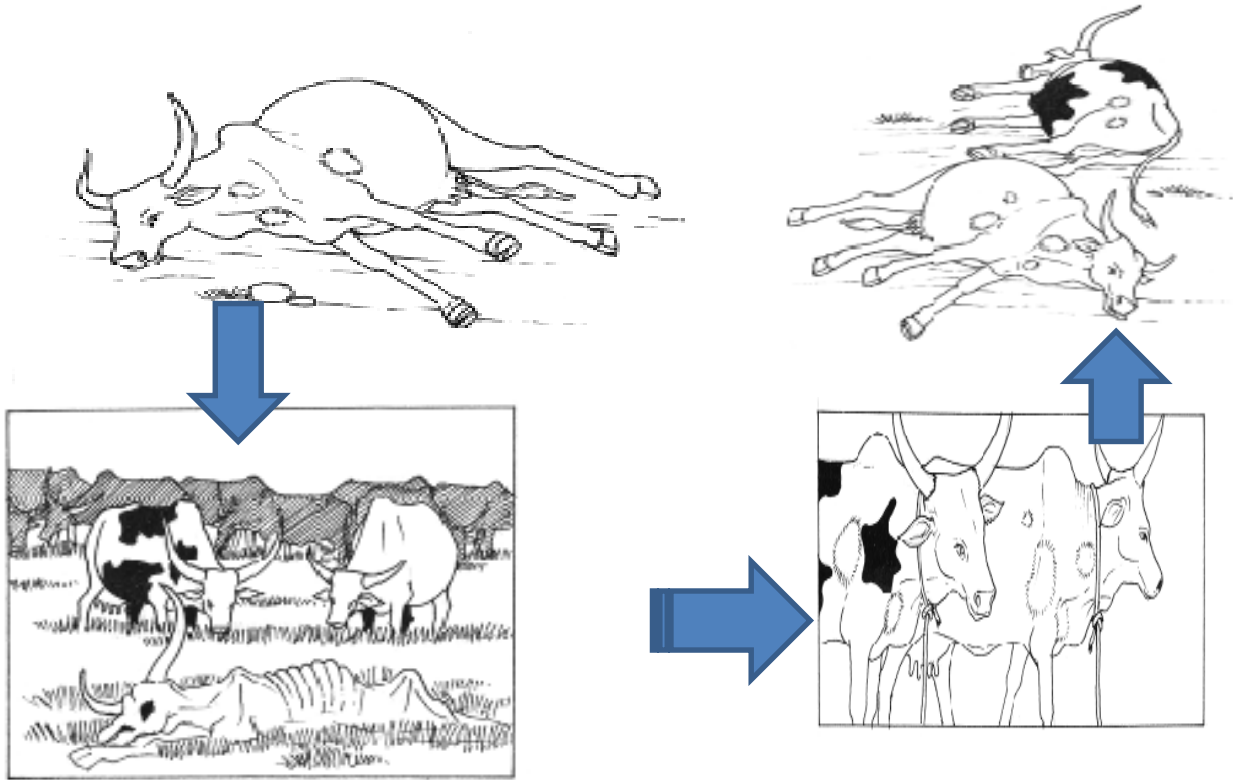


*Figure 17: Animal die due to high fever*

### linical signs:

- sudden swelling of one shoulder or upper part of one of hind legs
  - the swelling is hot and gives feeling of gas beneath the muscle
  - the skin is dry and shrinks
- fever, reluctance to move
- sudden death

**Transmission:**



Bacteria stays in the ground – animals get infected when grazing in the spot  
Disease is not transmissible to humans.

**Treatment:**



Penicillin in early stages. Injection shall be repeated after 3 days.

**Prevention:**



Dead animals shall be burned or buried deep in the ground



Yearly vaccination.

**HEMORRHAGIC SEPTICAEMIA (HS)**

Cause:  Pasteurella Multocida bacteria in lungs and blood



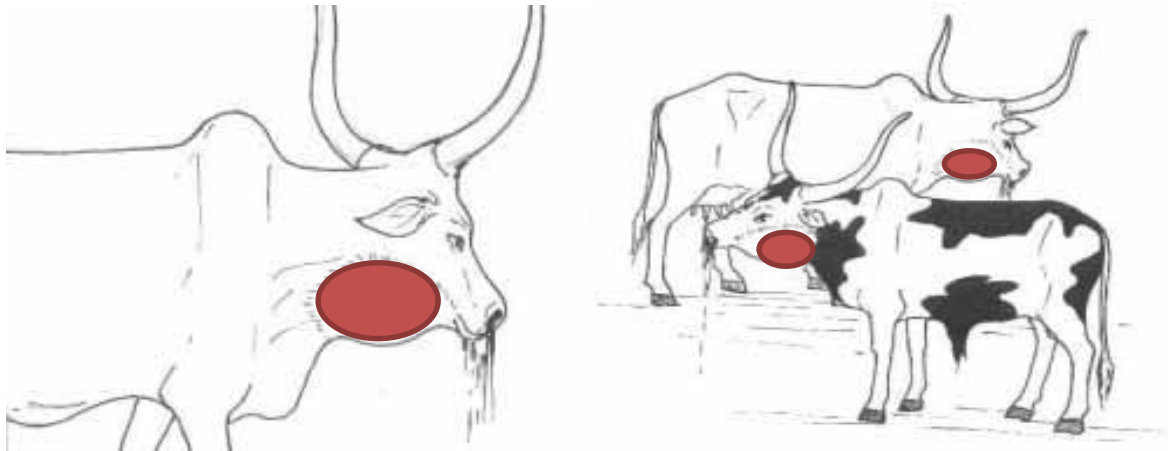
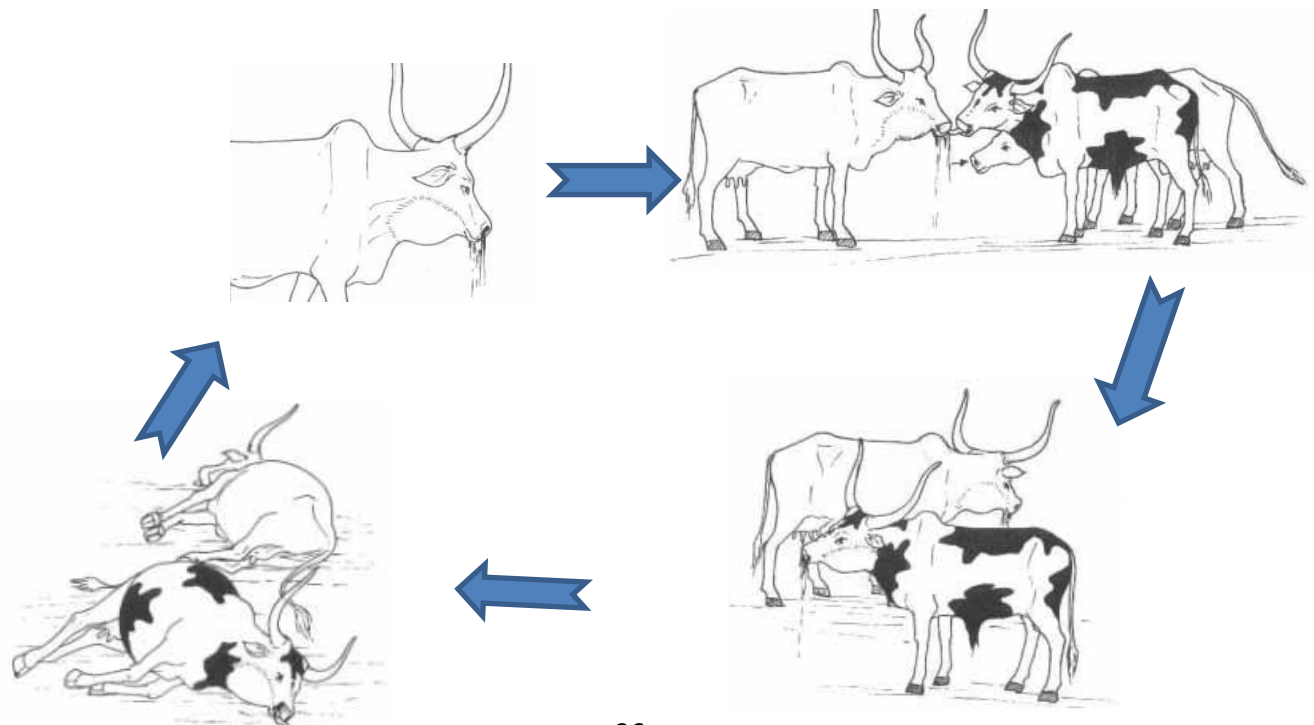


Figure 18: Animals get infected through contact with the sick animal

**Clinical signs:**

- sudden onset of high fever
- diarrhea, yellow nasal discharge
- swollen throat, tongue
- noisy breathing
- very fast development
- animal may die the same day

**Transmission:**

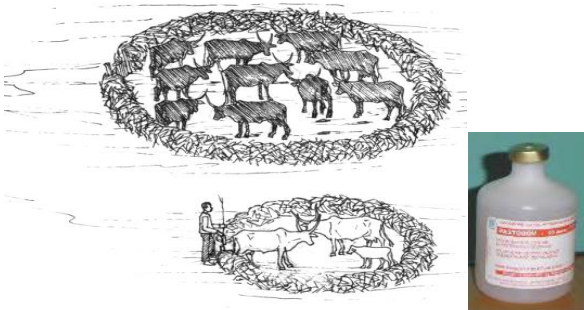


close contacts of coughing animals more often during the rainy season

**Treatment:**




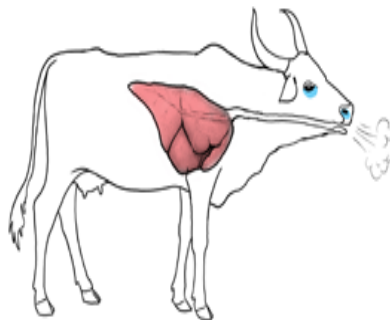
**Prevention:**



Early isolation of sick animals (those who have fever)  
Yearly vaccination

**CONTAGIOUS BOVINE PLEUROPNEUMONIA (CBPP)**

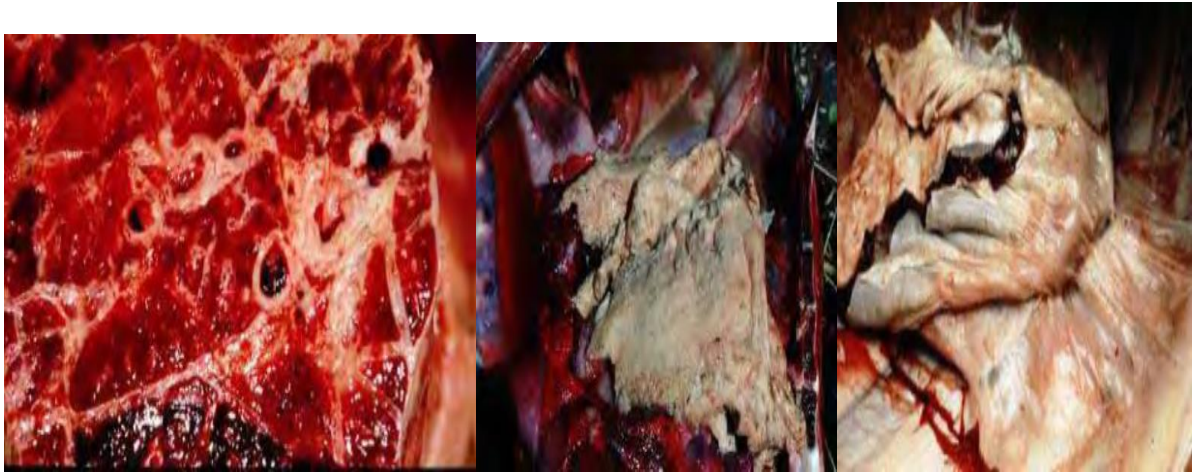
Cause:  Mycoplasma Mycoidis bacteria in lungs



**Clinical signs:**

- compared to HS slow development
- loss of weight and production
- coughing, difficult breathing, grunting
- watery discharge from nose and eyes
- standing with extended neck, towards the wind, elbows held forward
- rigid when squeezed on the back, not moving around

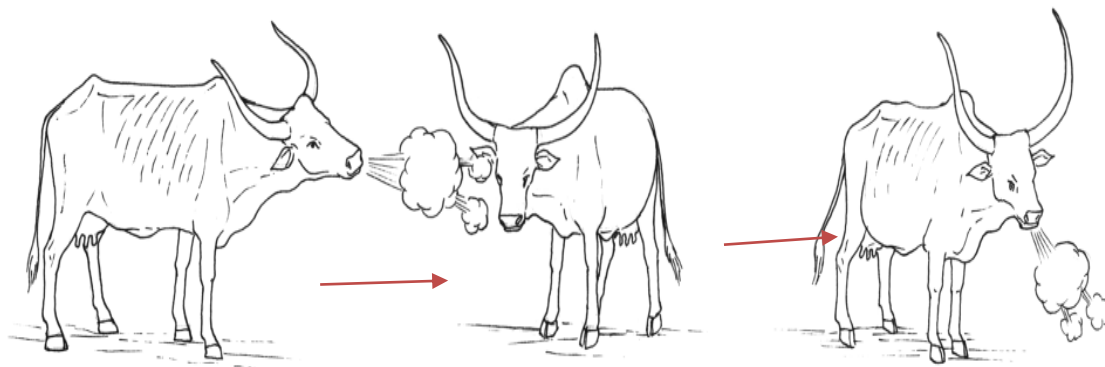
**Postmortem findings:**



*Figure 19: Bacteria affects the lungs*

- adhesions in the lungs and chest
- white lines on the lungs

**Transmission:**



*Figure 20:: Infection is always through contact*

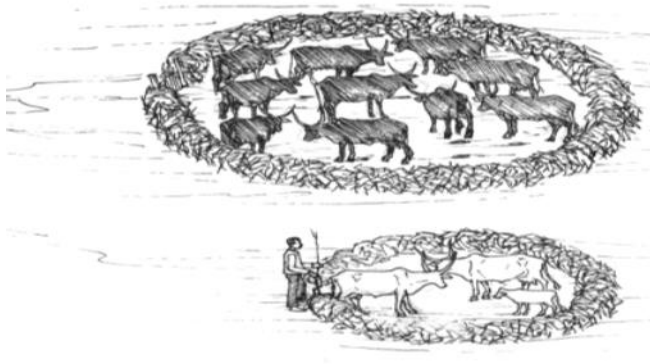
- close contacts of coughing animals
- animals carry the bacteria without clinical signs

**Treatment:**

- successful only in early stages; antibiotics




**Prevention:**



Isolation of sick animals and yearly vaccination



## BRUCELLOSIS

Cause:  bacteria *Brucella Abortus* which lives in reproductive organs of animal

Clinical signs:

### Female:



*Figure 21: Other animals and humans get infection through contact with the fetal fluid and the fetus. Avoid contact with the infected animal*

- abortions
- decreased milk production
- swollen joints
- fever

### Male:



*Figure 22: Animal that aborts should be culled and slaughtered to avoid farther transmission*



*Figure 23: A bull with swollen joints and/or swollen testicle should be slaughtered immediately*

- swollen testicles
- swollen joints
- Infertility

**Transmission:**

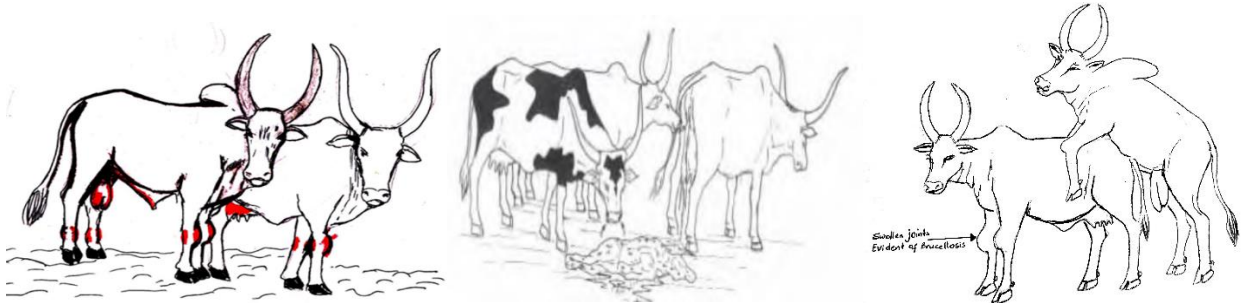


Figure 24: Isolate the calving cow to avoid contact with the healthy animals. Isolate and slaughter the bulls with swollen

- Brucella is transmitted during from male to a female during mating
- Bacteria is contained in aborted fetuses, in milk and meat

**Treatment:**

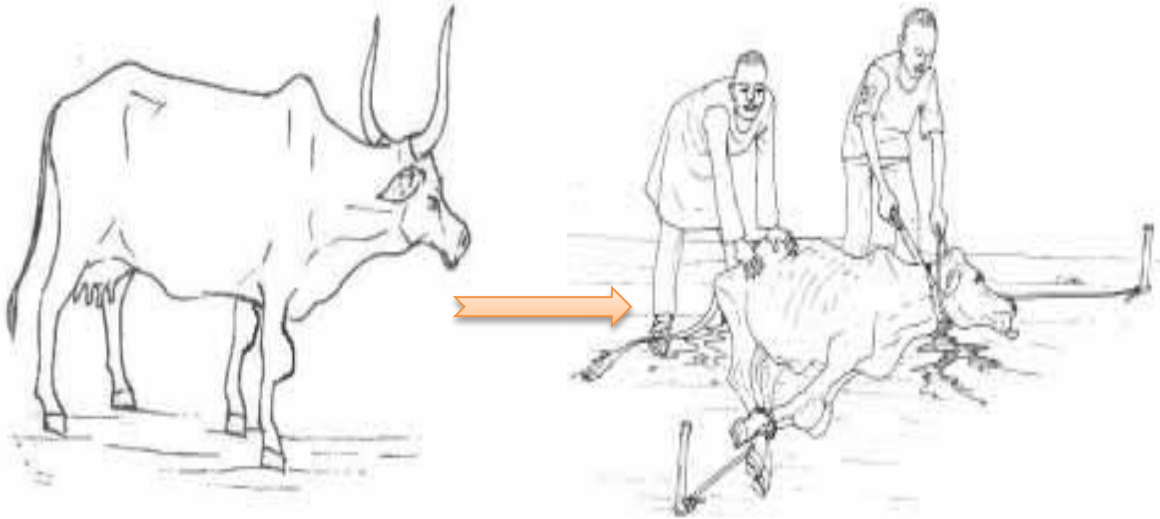


- Penstrep, days 1-2-3
- |  |
|--|
| <ul style="list-style-type: none"><li>• Disease can be treated by antibiotics, but only in a very early stage (immediately after mating, immediately after abortion)</li><li>• Animals with swollen joints are sick chronically and shall not be treated but slaughter</li></ul> |
|--|

**BRUCELLOSIS CAN BE TRANSMITTED TO HUMAN S!!**

**Prevention:**

**How to prevent transmission from one animal to human**

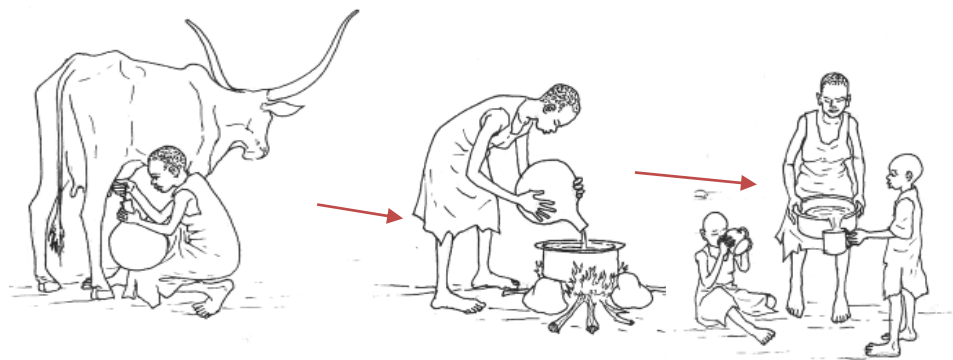


*Figure 25: Slaughter the cows or bulls with swollen joints*

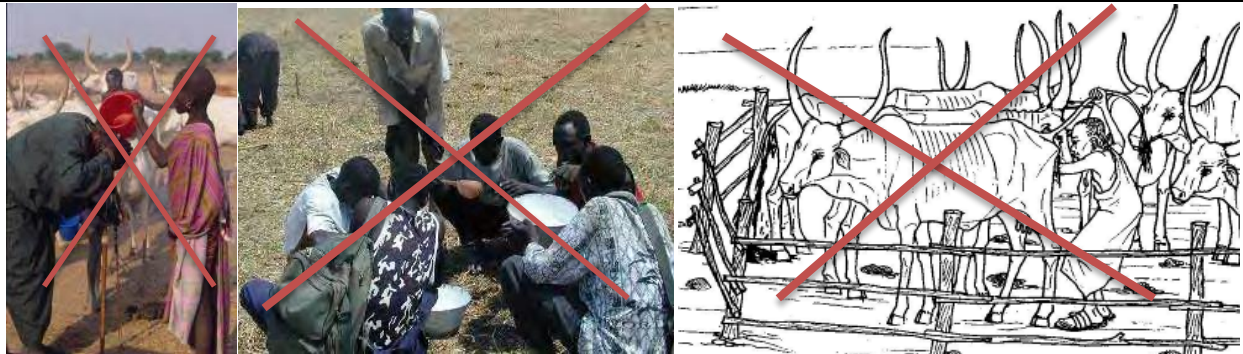
Slaughter bulls or cow with swollen joints

Give penicillin with complicated parturitions

**How to prevent infection of humans**



**ALWAYS** boil milk for 15 minutes before drinking



Don't drink milk from cows which repeatedly aborted




Never touch aborted fetus or placenta – burn them immediately  
Use gloves when assisting complicated parturition

- Don't blow the vulva to induce milking
- Search for treatment in early stage of the disease

**Clinical signs of brucellosis in human:**

- Fever on and off
- Always tired
- Abortions in women
- Swollen testicles in man

## FOOT AND MOUTH DISEASE (FMD)

**Cause:**  virus living in hoofs and mucous membranes



*Figure 26: FMD affects the foot, mouth and teats. Do not confuse it with the foot rot*

### **Clinical signs:**

- blisters on the margin of hoofs and between the fingers
- blisters in the mouth – resulting in increased salivation
- blisters on the udder – milk contains clots and blood
- all blisters usually open and get secondary infection
- lameness, lack of appetite
- abortions
- drop of milk

### **Transmission:**

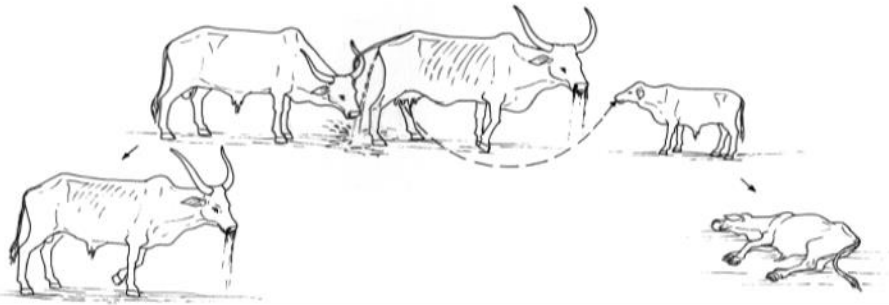


Figure 27: When similar signs of FMD appear in the nearby kraal, please control the movement of you animals and report the incidence to the authorities

- virus spreads very fast from one animal to another
- close contact, sharing water points, by mosquitoes

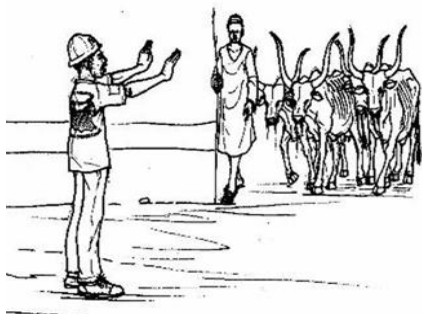
**Treatment:** ?????

- no medication can kill the virus




- antibiotics are given to treat secondary infection

**Prevention:**

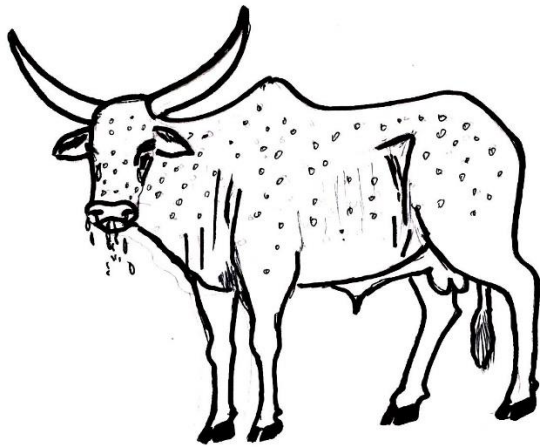


- in case of outbreak, all movements of animals must stop
- sick animals shall be isolated and treated
- vaccination by specific vaccine

## LUMPY SKIN DISEASE

Cause:  virus living in the skin of animal

### Clinical signs:



*Figure 28: LSD does kill more animals but can cause serious damage on their health. Use acaricide to prevent tick and mosquitoes*

- discharge from the eyes, nose and hypersalivation
- development of hard round skin nodules – starts at the muzzle, nostrils, neck, proceeds to the limbs and inguinal areas
- the nodules develop into deep infected ulcers, which became secondarily infected by bacteria
- fever
- loss of appetite
- swollen lymph nodes
- swollen limbs and genitals
- pneumonia and abortion
- reduced milk yield
- some animals die

### Transmission:





- mosquitoes, biting flies
- usually does not affect many animals in the herd
- lumpy skin disease cannot be transmitted to humans
- if the animal is killed in early stages of the disease, the meat is safe for human consumption

**Treatment:**   ??????




- there is no treatment for the virus
- any type of antibiotic can treat the secondary infection of the wounds
- topical disinfection of the ulcers and their regular hygiene
- strong animals will recover by their own immune mechanisms

**Prevention:**



- vaccination, application of acaricides

## FOOT ROT

Cause:  bacteria living in the mud + wrong shape of the hoof

### Clinical signs:

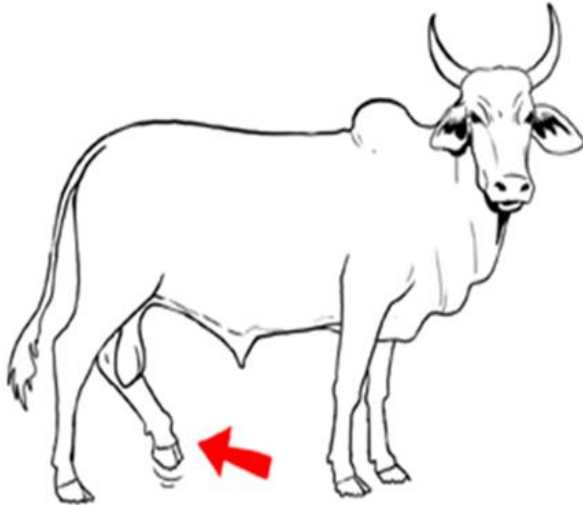


Figure 29: No blisters on the mouth, it confused with FMD

- lameness, reluctance to move
- hoofs swollen with infected wounds
- hoof gets detached from the fingers
- bad smell of hoofs
- !! no affection of mouth (difference from FMD)

### Transmission:

- if animals stay in mud or water for long time, the bacteria enters their hoofs; if the hoof is not trimmed, the condition gets worse

### Treatment:



Penstrep – 3 days in row

Disinfection and daily wash of hoofs (good restraint necessary!)

**Prevention:**



- Keeping animals in dry place
- Daily removal of dung from the sleeping area
- Healthy trimmed hoof is resistant to foot rot
- Disinfecting the hoof and sleeping places.

**TRYPANOSOMIASIS**

**Cause:**  parasite Trypanosoma living in the blood



**Clinical Signs:**

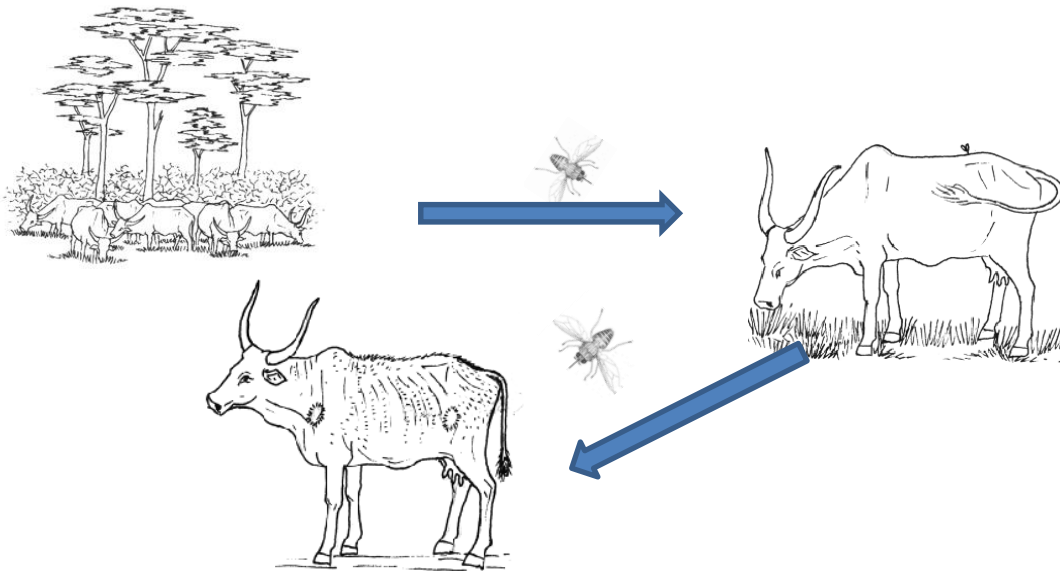


*Figure 30: No diarrhea, it confuses with liver fluke*



- Fluctuating fever (on and off)
- Swollen lymph nodes
- Loss of body condition
- Animal lags behind the herd
- Excessive lacrimation
- Dull, rough coat, loss of hair on the tail
- Anemia (loss of blood, white mucous membranes)
- Swellings of the lower part of body: legs, brisket and abdomen
- The disease can have acute or chronic form, death may occur in 1-6 months

**Transmission:**



- Transmitted by tsetse flies (*Glossina*)

**Treatment:**



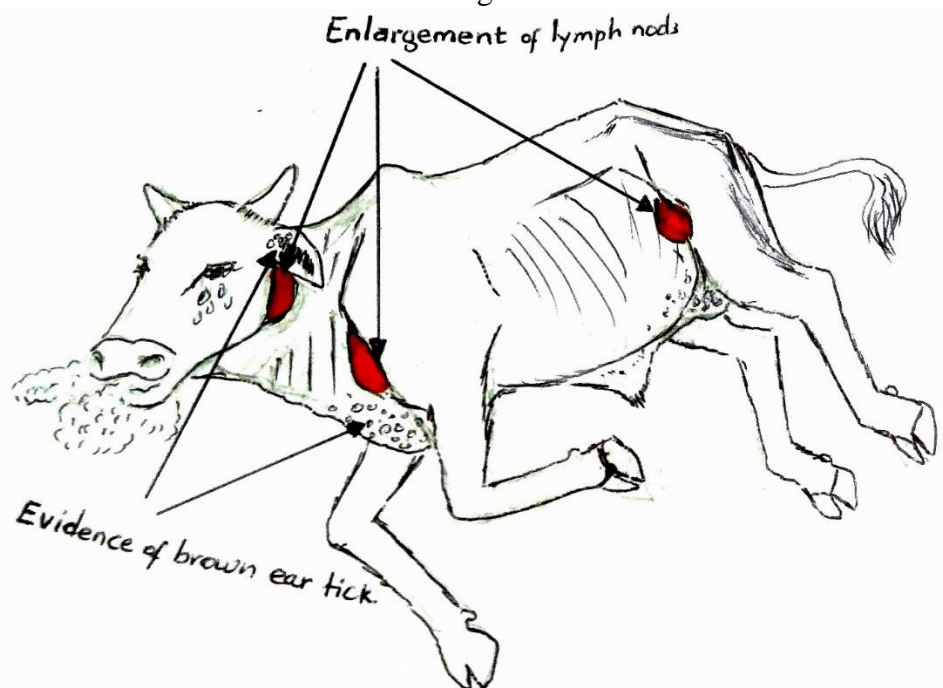
- Diminazene Diacetate
- Homidium Chloride (Novidium Chloride)
  - Homidium bromide (Ethidium Bromide)

**Prevention:**

- Application of acaricides,
- Prophylactic treatment of susceptible animals – every 3-6 months

**EAST COAST FEVER (ECF, Theileriasis)**

**Cause:**  Parasite Theileria living in the blood



**Clinical signs:**

- Swollen lymph nodes on the neck
- Fever (41-42°C)
- Animal eats less and loses condition

- Lacrimation, circling, shaking
- Difficult breathing
- Watery diarrhea, sometimes with blood
- Death usually occurs from 18 – 30 days after infection
- Some animals will survive, but lose productivity

**Postmortem findings:**

- Frothy liquid in trachea and lungs
- Lymph nodes enlarged
- Spleen is mushy or dry swollen or shrunken

**Transmission:**

- Transmitted by brown ear tick

**Treatment:**

There are three effective drugs for the treatment of ECF:

- Parvaquone (Clexon),
- Buparvaquone (Butalex),
- Halofuginone lactate (Terit),
- Oxytetracycline OTC injection is given together with Parvaquone or Buparvaquone to reduce the



**Prevention:**

- Using Acaricides,
  - Avoiding long movements
- 

## HEARTWATER

**Cause:**  bacteria living in the blood

**Clinical signs:**

- Fever, depression, not eating
- Difficult breathing, convulsion
- strange stiff movements, exaggerated blinking and chewing
- sudden death may occur

**Postmortem findings:**

- lot of straw-colored fluid in the thorax and abdomen

**Transmission:** only through ticks

**Treatment:** Oxytetracycline repeated application (day 1-3-5)

**Prevention:** application of acaricides

---

## COCCIDIOSIS

**Cause:** Small parasite living in the wall of gut



**Clinical signs:** Yellowish diarrhea mostly in calves, sometimes can develop into bloody diarrhea. Calves are not growing well. Nervous acute form may occur, with

**Transmission:** Close contact and by grazing

**Treatment:** amprolium

## MASTITIS

**Cause:**  bacteria living in the udder



**Clinical signs:**

- One part or whole udder swollen, hot and painful
- Difficult to milk, milk has changed consistency or color

**Transmission:** By hands during milking

**Treatment:**



antibiotics

**LIVER FLUKES**



**Cause:** Parasite Fasciola (fluke) living in the liver

**Clinical signs:**

- Animal is loosing condition, pale or yellow membranes
- young animals are growing slow despite good grazing
- swelling under the jaw, swollen lower parts of the body
- diarrhea, reduced milk production



rs developed by War Child Canada South Sudan

Figure 31: There is diarrhea in liver fluke, it confuses with Trypanosomiasis

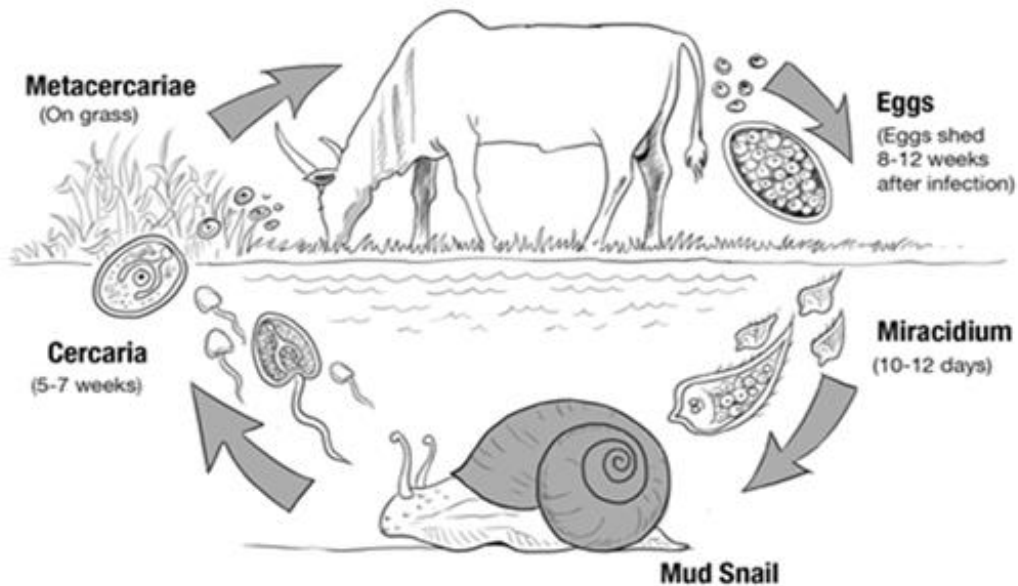


**Postmortem findings:**



- flukes occur in the liver, look like small leaves
- the tissue of liver can be changed (dark or white places)
- gall bladder may contain blood

**Transmission:** Fasciola is transmitted through snails



**Treatment:**



- Albendazole, rafoxanide and triclabendazole
- Treatment should be repeated every 3 months

**Prevention:**

- Delay grazing cattle in infested marshes as much as possible
- Biological control of snails – using fish and ducks
- Regular application of albendazole (Deworming)

**HAEMONCHOSIS**

**Cause:** A worm called Hemonchus which lives in the stomach of cattle, sheep and goat and sucks blood



**Clinical signs:**

- pale membranes, lack of blood in the body
- loss of weight
- weakness, the limbs cannot support the body
- mainly seen in lambs
- can be acute = very fast with death after one week
- or chronic = slow, developing several weeks
- usually no diarrhea

**Treatment:**



Albendazole

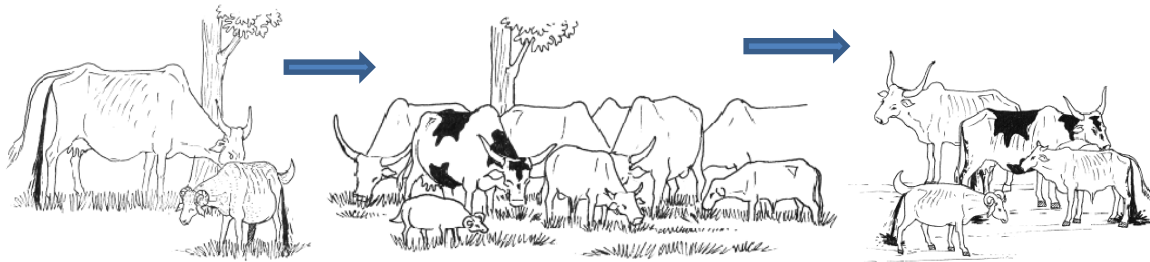
## GUT WORMS

**Cause:** parasites living in the gut



**Symptoms:** Emaciation, weakness, growth retardation, anaemia and death.

### Transmission



### Treatment:



Levamisole, albendazole, depending of the type of worms.

**Prevention:** hygiene, sanitation

## CYSTICERCOSIS AND ECHINOCOCCOSIS

**Cause:** Some parasites (tapeworms) spend part of their life in the body of cow, sheep or a goat, while another part of their life happens in another host (dog, mouse or even human).

When in the body of ruminants, parasites form cysts – white vesicles with fluid or paste inside.



**Clinical findings:** The cysts usually do not cause any problems on living animals. They are usually found only at the slaughter house.

### **Postmortem findings:**

Cysts can be found


- in muscles (masticatory muscle, tongue, heart, diaphragm and other)
  - in internal organs (liver)
  - in between of the internal organs
- 

## **CYSTS CAN CAUSE DISEASE IN HUMAN**

### **How to prevent transmission of the parasites from animals to humans**

- 1) Do not consume meat or organs which contain cysts - if cysts are observed during slaughter, remove all organs containing the cysts and bury them or burn them (do not give to the dogs, because they can spread the disease)
- 2) Always cook the meat at least one hour
- 3) Wash your hands carefully after handling raw meat and before eating
- 4) Keep dogs away from kitchen and don't let them lick utensils or baby bottoms
- 5) Use albendazole for you and your family twice per year

## **TUBERCULOSIS**

Cause:  bacteria living in lungs, gut or bones



### **Clinical signs:**

- loss of weight, drop in milk production
- productive cough for long time, sometimes with blood
- signs may be absent and the animal can only be losing weight

### Postmortem findings:

- « balls » found in the lungs or in the gut – filled with yellow or white matter
- Lymph nodes change into yellow or black hard balls

### Transmission:

- By close contact and consumption of milk/meat
- 

## TUBERCULOSIS IS TRANSMISSIBLE TO HUMAN

- In humans, the disease appears as general weakness and cough, sometimes with blood

### Treatment:

- Sick animals shall be slaughtered, treatment is not possible
- Treatment is possible in humans, but has to be strictly followed for several months

### Prevention:

#### How to avoid transmission of tuberculosis from animals to humans



- Always boil milk before consumption



- Do not touch discharges coming out of infected animals
- Do not get in close contact with animals who are coughing



- Isolate or slaughter animals which have persistent cough



- Dont consume meat or milk from the animals slaughtered due to the sickness

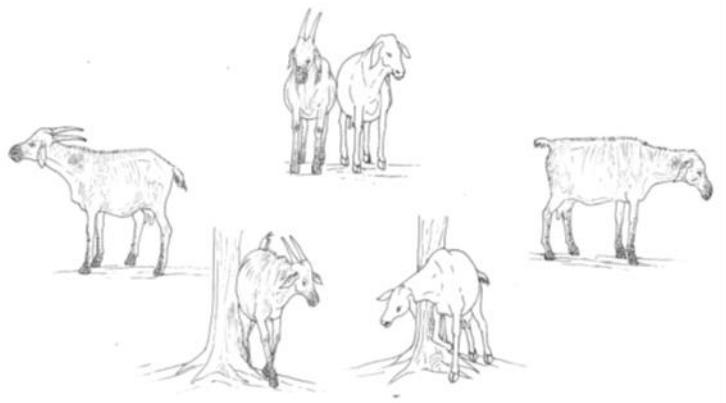
## How to avoid transmission of tuberculosis between animals

- Isolate or slaughter infected animals
  - do not milk infected animals
- 

## MANGE

Cause:  parasite living in the skin

### Transmission:



Through direct contact



### Clinical signs:

- loss of hair, cracking skin
- rubbing
- loss of condition




- starts around the head and necks, spreads fast all over the body and to other animals

### Treatment and prevention:



- ivermectin
  - antibiotics for secondary infection of wounds
- 

## DERMATOPHILOSIS

**Cause:**  bacteria living in the skin

### Clinical signs:

- mainly during rainy season
- circular patches on the skin, starting on the muzzle and ears
- in serious cases skin looks like peeling off from large parts of the body

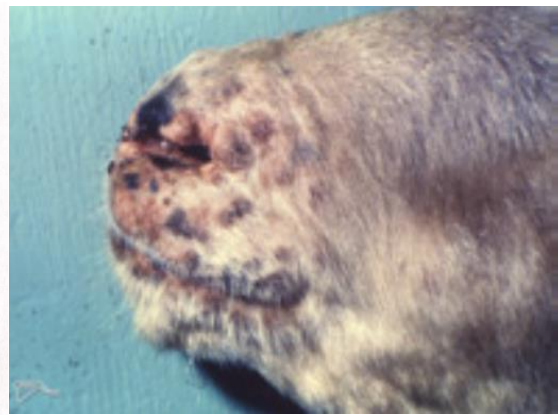
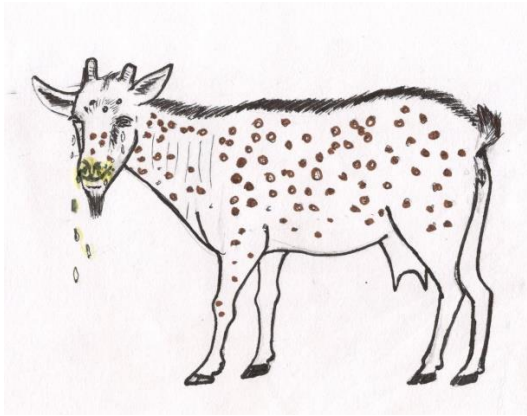
**Transmission:** Through close contact (often when new animal is introduced to the herd)

**Treatment:** local application of disinfectant (spray, povidone), injection of antibiotics

---

## SHEEP AND GOAT POX

**Cause:** virus living in the skin of the animals



**Clinical signs:**

- swollen eyelids
- yellow discharge from the nose
- skin wounds and small swelling on muzzle
- difficult breathing
- often results in death

**Postmortem findings:**

- spots in trachea and lungs

**Transmission:**

- by close contact or insects

**Treatment:** antibiotics for secondary infection

**Prevention:** regular vaccination, isolation of sick animals

**ORF (CONTAGIOUS ECTHYMA )**

**Cause:** virus transmitted by close contact



**Clinical signs:**

- wounds around the lips, slowly changing into crusts
- sometimes affects also the legs or teats

**Transmission:**

- By close contact

**ORF IS ZOOBOTIC / TRANSMISSIBLE TO HUMAN S !**

- Humans can develop wounds on hands and face as they are touching infected animals

**Treatment:** Antibiotics and ivermectin for secondary infection

**Prevention:** Isolation of sick animals

**PESTE DES PETITS RUMINANTS (small ruminant plague, PPR)**

**Cause:** virus





### Clinical Signs:

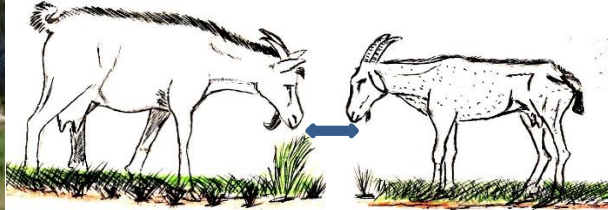
- Incubation is 2-6 days
- Fever (40 – 41°C), depression
- Sneezing, coughing, difficult breathing
- Sores in mouth, animal does not eat
- Dry cracked muzzle and nostrils
- Discharge from eyes, nose and mouth, first watery, later purulent
- Bad smell from mouth
- Severe diarrhea sometimes with blood
- Mortality of 70 – 90%, death occurs within 7 days

### Postmortem Findings:



- Enlarged lymph nodes
- Dark spots in stomach
- Bloody spots in lungs
- diarrhea

### Transmission:



- through close contact
- Secretions from sick animals contain the virus, which can be transmitted in small droplets


**Treatment:**

- No specific treatment
- Antibiotics can be given to decrease secondary bacterial infection

**Control:**

- Vaccination
  - Isolation of sick animals
  - Control of livestock movement
- 

**CONTAGIOUS CAPRINE PLEUROPNEUMONIA (CCPP)**

**Cause:**  bacteria living in the lungs of goats



**Clinical signs:**

- Coughing for long time
- Difficult and fast breathing
- Loss of condition
- Eye discharge
- fever

**Postmortem findings:**



- yellow liquid in the thorax
- lungs have visible yellow or white lines
- Lungs attached to the ribs

**Transmission:**



Close contact of animals

**Treatment:**



Tylosin, OXYTETRACYCLINE or Penstrep

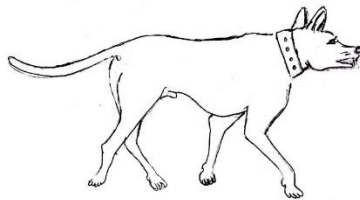
**Prevention:**

Vaccination

Isolation of sick animals

**RABIES**

**Cause:** virus living in the brain

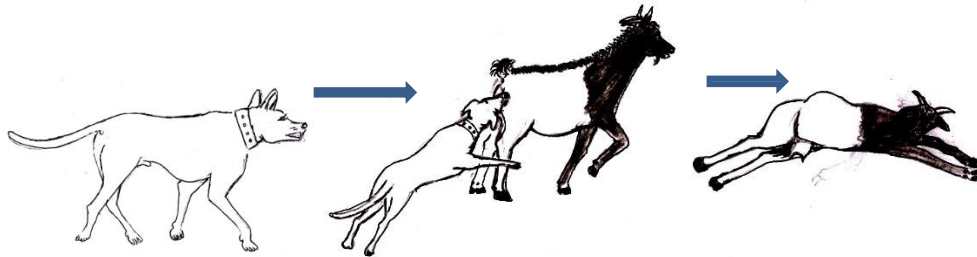


**Clinical signs:**

- Affects all mammals (animals and humans alike)
- Aggressiveness
- Strange movements, paralysis

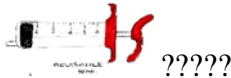
- Fear of water
- Excess salivation
- Seizures, convulsions
- Death within 7 days (ALL INFECTED CASES DIE!)

### Transmission:



Through bite – virus is contained in the saliva of sick animals and when a bite occurs, the virus enters the wound. From the wound, it travels along the nerves up to the brain. There are no clinical signs until the virus reaches the brain; but once this happens and the disease starts showing itself, no cure is possible.

### Treatment:



The disease is not treatable and can only be prevented if post-exposure vaccination is done shortly after the bite.

### How to prevent transmission of rabies from animals to humans

- In case of bite (by dog or other animal) clean the wound thoroughly with soap and water
- Go to hospital immediately after the bite and search for post-exposure treatment
- Do not kill the biting dog (or other animal) immediately, but quarantine it for at least 15 days in order to observe whether rabies symptoms develop or not

### How to avoid dog bites

- Do not approach nervous or aggressive dogs
- Never touch a dog which is eating, sleeping or taking care for puppies
- Do not step on dogs or throw stones at them
- Use dog muzzles to avoid bites during clinical examination and treatment or vaccination



## DISEASES OF POULTRY

### AVIAN INFLUENZA

**Cause:** virus



**Symptoms:** can be low or highly pathogenic.

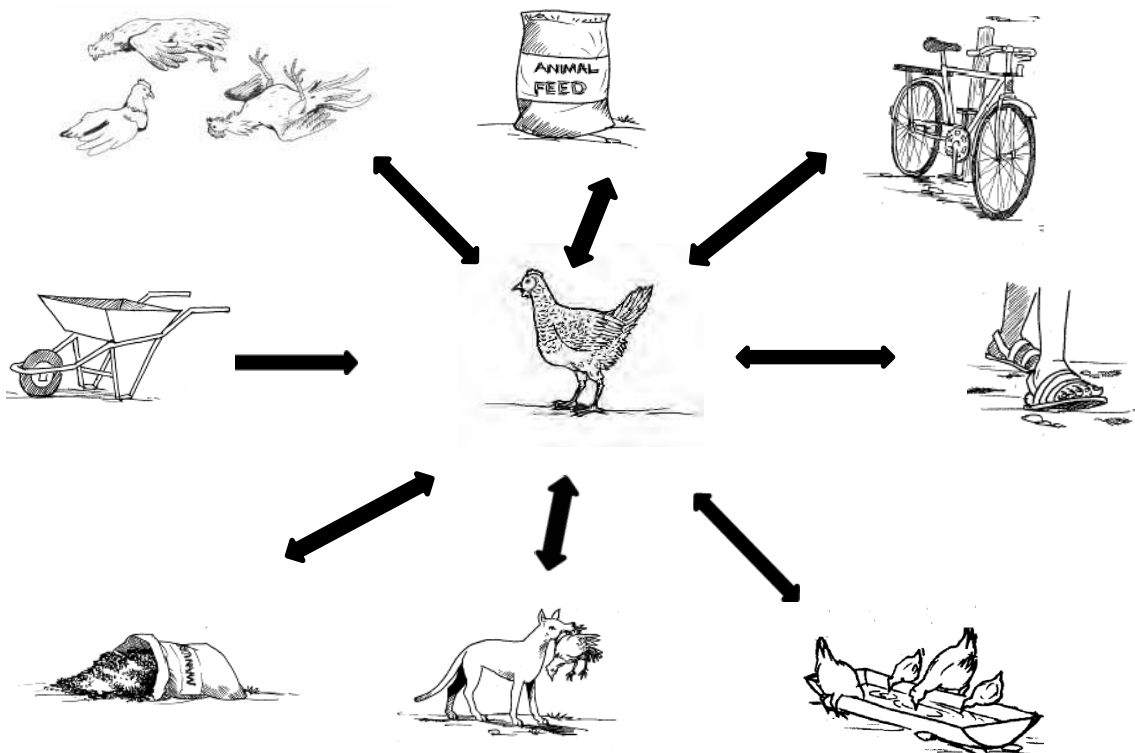


### Postmortem Signs



**Transmission:**

Direct contact between birds.



People can transmit the virus on their shoes and clothes



**Treatment:**  ?????

None. All the birds should be killed.

**Prevention:**



Chicken which died of the disease should not be eaten

## CHRONIC RESPIRATORY DISEASE

**Cause:** bacteria living in respiratory tract

**Symptoms:** Exudate in nose and eyes, difficult breathing.

**Transmission:** Close contact between birds, contamination of environment or through eggs.

**Treatment:**

Oxytetracycline or tylosin

## FOWL CHOLERA (AVIAN HEMORRHAGIC SEPTICAEMIA)

**Cause:** bacteria

**Symptoms:** Fever, loss of appetite, mouth discharge, ruffled feathers, yellowish or greenish diarrhoea, respiratory difficulties, joint swelling.

**Transmission:** from sick birds, wild birds, humans, animals or things.

**Treatment:** sulfadiazine

---

## GUMBORO DISEASE (INFECTIOUS BURSITIS)

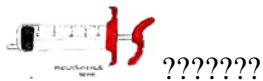
**Cause:** virus



**Symptoms:** rapid onset, watery white diarrhoea, ruffled feathers.

**Transmission:** Direct contact with contaminated birds, people and equipment.

**Treatment:**



None.

## INECTIOUS CORYZA

**Cause:** bacteria

**Symptoms:** Swelling face, sticky discharge from nose and eyes, difficult breathing

**Transmission:**  
close contact.

**Treatment:**  
oxytetracycline

**Prevention:** Vaccination, sanitation.

## MAREK DISEASE

**Cause:** virus



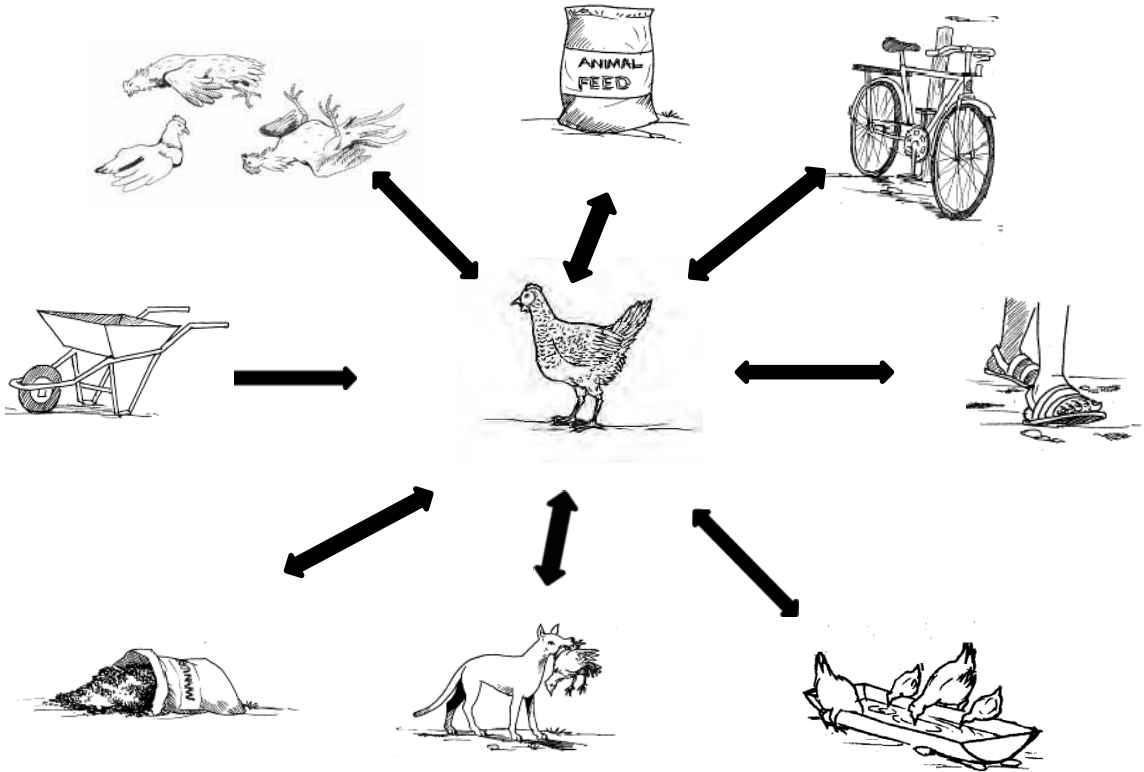
**Symptoms:** neurologic symptoms (blindness, strange movement), apathy, anemia (paleness, emaciation), greenish diarrhea, weak breathing.

**Necropsy:** Tumors of the liver, kidney, spleen and pancreas,

**Transmission:** by dust, feces and saliva. Infected birds carry the virus for life

**Transmission:**

Direct contact between birds.



**Treatment:** None.

**Prevention:** vaccination

**NEWCASTLE DISEASE**



**Cause:** virus

**Symptoms:**




Apathy, ruffled feathers, watery discharge from nose, respiratory difficulties, facial swelling, paralysis, trembling, and twisting of the neck. Egg production decreased. Greenish diarrhoea. Red spots in skin.

**Postmortem findings:** Blood in crest and wattle, diarrhea, red spots on internal organs.



**Transmission:**

the virus is shed in body fluids, secretions, excreta, and breath. During an outbreak the virus is spread in exhaled air, respiratory discharges, feces and eggs. Healthy birds may be infected from these sources, and hatcheries from infected eggs.

**Treatment:**  ???????  
None. Treat secondary infections

**Prevention:**



Vaccination, sanitation

## SALMONELLOSIS AND COLIBACILLOSIS (FOWL TYPHOID)

**Cause:** bacteria



**Symptoms:** diarrhoea (watery, mucoid, with blood), inappetence and reduced egg-laying. Mortality is usually high.

### Posmortem findings:

abdominal organs are bloated, watery and mucoid material tinged with blood can be found. The livers are enlarged and yellow/green, or may have pale dots. The spleen and kidneys are also enlarged, and the blood is thin and watery.



### Treatment:

Antibiotherapy – oxytetracycline or tylosine

**Prevention:** hygiene, sanitation



## COCCIDIOSIS

**Cause:** small parasite living in the wall of gut



**Symptoms:** Apathy, loss of appetite, blood or mucus in the faeces, yellowish diarrhoea, dehydration, and even death.

**Postmortem findings:** thickening of the intestines (ballony). Light or red colored spots on the surface of the gut.

**Epidemiology:** contaminated food, water, shoes, caretakers, visitors, dirty equipment, feed sacks, other chickens and wild birds.

**Treatment:**

TMS, amprolium

**Prevention:** hygiene, sanitation

## SOME IMPORTANT DISEASES OF LIVESTOCK IN LOCAL LANGUAGES

### LIVESTOCK DISEAS

| ENGLISH                                  | DINKA      | LUO        |
|--|------------|------------|
| ANTHRAX                                  | Jong Nhial | Juai Riemo |
| BLACK QUARTER (Blackleg)                 | Macou      | Ujogo      |
| HEMORRHAGIC SEPTICAEMIA (HS)             | Marol      | Marol      |
| CONTAGIOUS BOVINE PLEUROPNEUMONIA (CBPP) | Abuot      | Atuany kau |
| BRUCELLOSIS                              | Cual       | Cual       |

|   |                        |                    |
|---|------------------------|--------------------|
| FOOT AND MOUTH DISEASE (FMD)                            | Dat                    | Dat                |
| FOOT ROT  | Agim                   | Gingim             |
| TRYPANOSOMIASIS   | Liai                   | Tuany Manhiai      |
| EAST COAST FEVER (ECF, Theileriasis)                    | Jok Juba               | Tuany Juba         |
| HEARTWATER  | Makieu                 | Makieu             |
| COCCIDIOSIS   | Aloric                 | Aloric             |
| MASTITIS  | Atak                   | Loun               |
| LIVER FLUKES  | Abut Cuei (Guak)       |                    |
| HAEMONCHOSIS  | Kam                    | Thiou              |
| CYSTICERCOSIS AND ECHINOCOCCOSIS                        | Thiou                  | Thiou              |
| TUBERCULOSIS  | Pier                   | Tuany Wolo         |
| MANGE   | Matembiok<br>(Manyuin) | Temtem/<br>Manyuin |
| SHEEP AND GOAT POX                                      | Akuok (Makuok)         | Gwala              |
| ORF (CONTAGIOUS ECTHYMA )                               | (Amiok)                | Amiok              |
| PESTE DES PETITS RUMINANTS (small ruminant plague, PPR) | Awet Thok<br>(Macith)  | Awet Thok          |
| CONTAGIOUS CAPRINE PLEUROPNEUMONIA (CCPP)               | Abuot Thok             | Tuany Kau Diel     |
| RABIES  | Wath                   | Wath               |
| GUT WORMS   | Ngany                  | Ngany              |

## DISEASES OF POULTRY

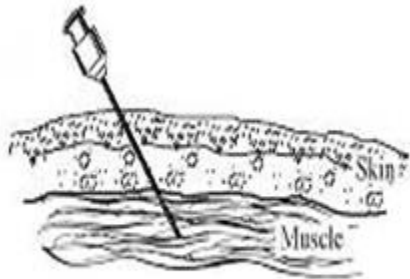
| ENGLISH  | ARABIC | DINKA            | LUO |  |
|--|--------|------------------|-----|--|
| AVIAN INFLUENZA                                |        | Juai             |     |  |
| CHRONIC RESPIRATORY DISEASE                    |        | Atherpuou        |     |  |
| FOWL CHOLERA (AVIAN HEMORRHAGIC SEPTICAEMIA)   |        | Abaric<br>Ajiith |     |  |
| NEWCASTLE DISEASE                              |        | Apalac           |     |  |
| SALMONELLOSIS AND COLIBACILLOSIS (FOWLTYPHOID) |        | Nok Ajith        |     |  |
| COCCIDIOSIS                                    |        | Aloric           |     |  |

|  |  |        |  |  |
|--|--|--------|--|--|
|  |  | Ajiith |  |  |
|  |  | Juai   |  |  |
|  |  |        |  |  |

## VETERINARY DRUGS

### TYPES OF INJECTIONS

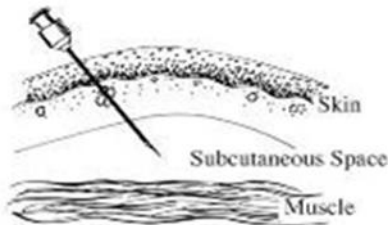
#### Intramuscular:



Intramuscular Injection

- Deep in the muscle; the whole needle enters the body
- Use of long needles (3-4 cm), perpendicular angle
- Hind leg or shoulder
- Aspire before application, to avoid blood veins

#### Subcutaneous:



Subcutaneous Injection

- Under the skin, into the skinfold
- Use Short needles (1-2cm), sharp angle
- Neck or thorax

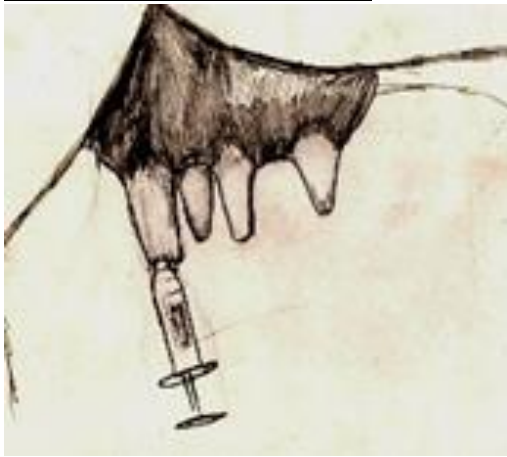
The neck area is suitable for both intramuscular and subcutaneous application

**Peroral application:**



- used mainly for application of deworming drugs
- performed by syringe or drencher

**Intramammary application:**



- Through natural opening of the teat
- Always with clean applicator
- Used mainly for treatment of mastitis

## ADMINISTRATION OF DRUGS

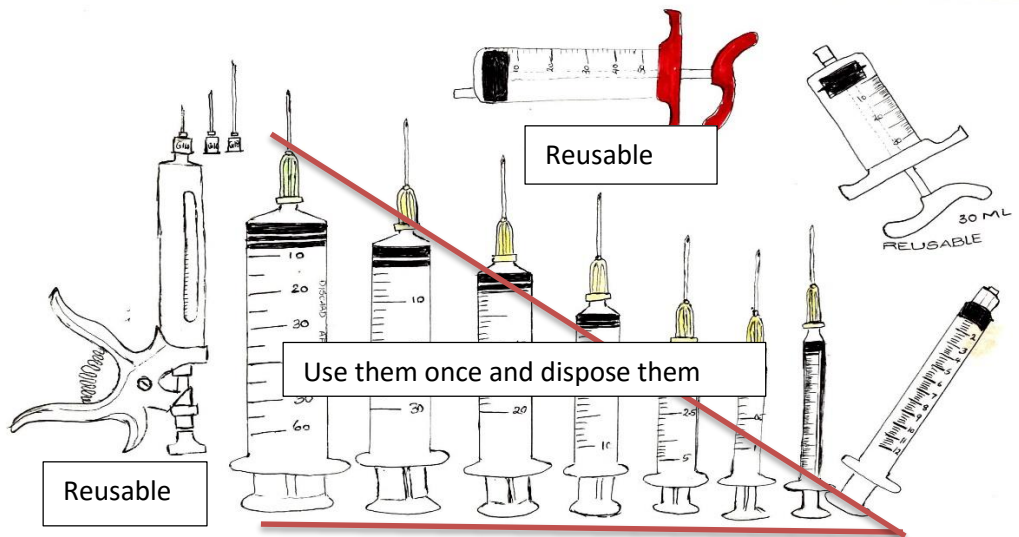
Knowing the weight of an animal is important in order to decide about the drug dose. Even if we cannot tell the exact weight of an animal, we can estimate it based on the age and gender of the animal.

|  | <b>Newborn</b> | <b>6 months old</b> | <b>1 year old</b> | <b>Adult male</b> | <b>Adult female</b> |
|--|----------------|---------------------|-------------------|-------------------|---------------------|
|  | 5 kg           | 15 kg               | 20 kg             | 50 kg             | 40 kg               |
|  | 5 kg           | 20 kg               | 30 kg             | 50 kg             | 40 kg               |
|  | 20 kg          | 50 kg               | 70kg              | 150 kg            | 120 kg              |
|  | 20 kg          | 80 kg               | 120 kg            | 350 kg            | 250 Kg              |
|  | 30 kg          | 100 kg              | 200 kg            | 500 kg            | 350 kg              |

**WEIGHT ESTIMATION**



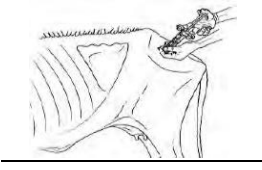
Weight can also be estimated based on comparison to your own body, if you know your weight


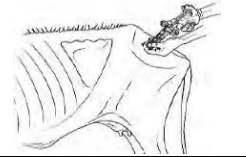














### DOSAGES OF DRUGS

Correct dose = successful treatment

| <u>Type</u>            | <u>Dosage</u>  | <u>Administration</u>  | <u>Disease</u>   |
|------------------------|--|--|--|
| <u>Albendazole</u>     | <br><b>1 ml/10 kg</b>   | <u>Oral</u>  | Flukes and worms   |
| <u>Oxytetracycline</u> | <br><b>Dosage: 1ml / 10 kg</b><br><b>One injection lasts 72 hours.</b><br><b>1 injection only in 3 days is necessary for a proper treatment</b> | <u>Intramuscular</u><br> | Bacterial Infection<br>E.g Anthrax, BQ, HS, Mastitis, CBPP |

|                                     |  |   |  |
|-------------------------------------|--|---|--|
| <p><u>Tylosin</u></p>               |  <p><b>Dosage: 1ml / 10 kg<br/>One injection lasts 72 hours.<br/>1 injection only in 3 days is necessary for a proper treatment</b></p> | <p><u>I/M</u></p>         | <p>Bacterial Infection<br/>E.g Anthrax, BQ, HS, Mastitis, CBPP</p> |
| <p><u>Penstip</u></p>               |  <p><b>Dosage: 1ml/30kg One injection lasts 72 hours.<br/>1 injection only in 3 days is necessary for a proper treatment</b></p>        | <p><u>I/M</u></p>         | <p>Bacterial Infection<br/>E.g Anthrax, BQ, HS, Mastitis, CBPP</p> |
| <p><u>Amitraz</u></p>               |  <p><b>20 ml in 1 litre of water (Use as spray)</b></p>   | <p><u>External</u></p>  | <p>Parasite: E.g Mange, Tsetse fly, mosquitoes, flies</p>          |
| <p><u>Ethidium</u></p>              |  <p><b>1 Tablet per a cow dilutes into 10ml</b></p>   | <p><u>I/M</u></p>       | <p>Trypanosomiasis</p>   |
| <p><u>Opticlox Eye Ointment</u></p> |  <p><b>Syringe of 5 grammes ointment<br/>Cloxacillin<br/>Penicillin</b></p>   | <p><u>External</u></p>  | <p>Treatment of eye infection</p>                                  |

|  |  |   |   |
|--|--|---|---|
| <p><u>Oxytetracycline</u><br/><u>Wound Spray</u><br/><u>250mg/ml</u></p> |  <p><b>200 ml spray bottle containing oxytetracyclin and gentian violet</b></p> | <p><u>External</u></p>      | <p>Wounds , Blisters, Burns and nodules</p>   |
| <p><u>Ivermectin 1% 50ml vial</u></p>                                    |  | <p><u>Subcutaneous</u></p>  | <p>Treatment of internal and external Parasits<br/>E.g Liver Fluke, gut worms, cyct, ticks, mange, lice, mites,</p> |

**Low dose** of a drug will not cure the animal. It will also contribute to a problem called antimicrobial resistance – this means that bacteria or parasites might get used to the drug in the environment and the drug will not have any effect on them anymore.

**Dose higher than normal** might have toxic effect on animal (leading even to death). It also pollutes the environment. It is a wasteful use of the drug.

If you sell a drug to animal owner, always instruct him well about the correct dose!

#### HANDLING OF VETERINARY DRUGS

1. Drug contains active ingredient which is injected in the body of the animal
2. The ingredient attacks the cell wall of the causative agent to counteract its function.
3. Some drugs are specific to the bacteria but can act on other groups.
4. The effectiveness of the drug depends on how best the veterinary person handle them before injecting it into the body of the animal
5. When the a drug enters the body, it either kills or alter the action of the causative agent.
6. Most of the drugs need to be kept in cool dry place and out of reach of children.



## Instructions

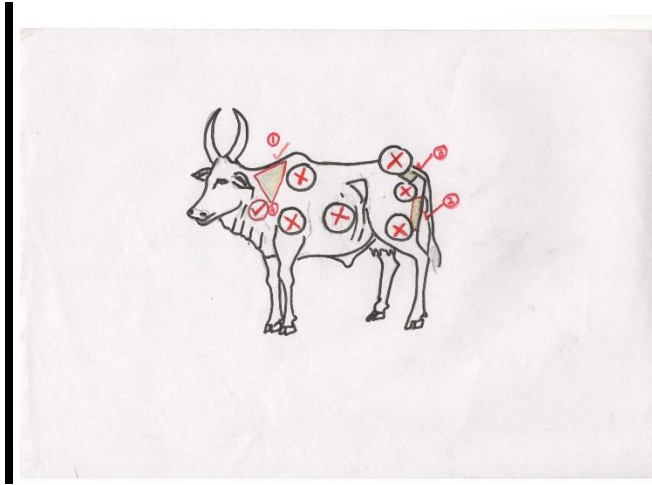
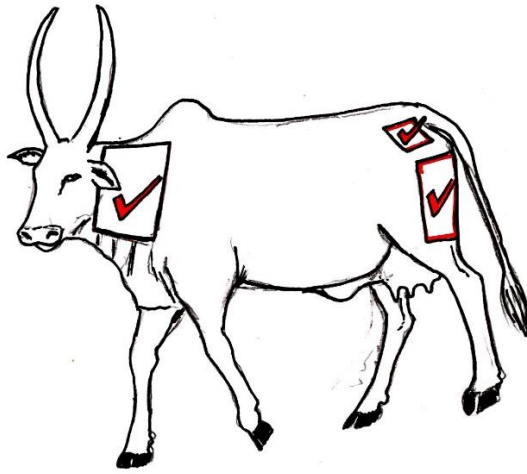


1. Read the expiry date carefully before use
2. Drugs with the near expiry date should be immediately used
3. Drug with expiry date should be discarded by disposal through incinerator or manual burning
4. Do not use the empty bottle for any other purpose
5. Read the dose instruction carefully and follow the required dose, frequency and withdrawal period

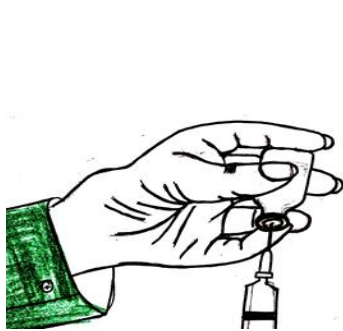
## Sides of injections

### Intramuscular injection

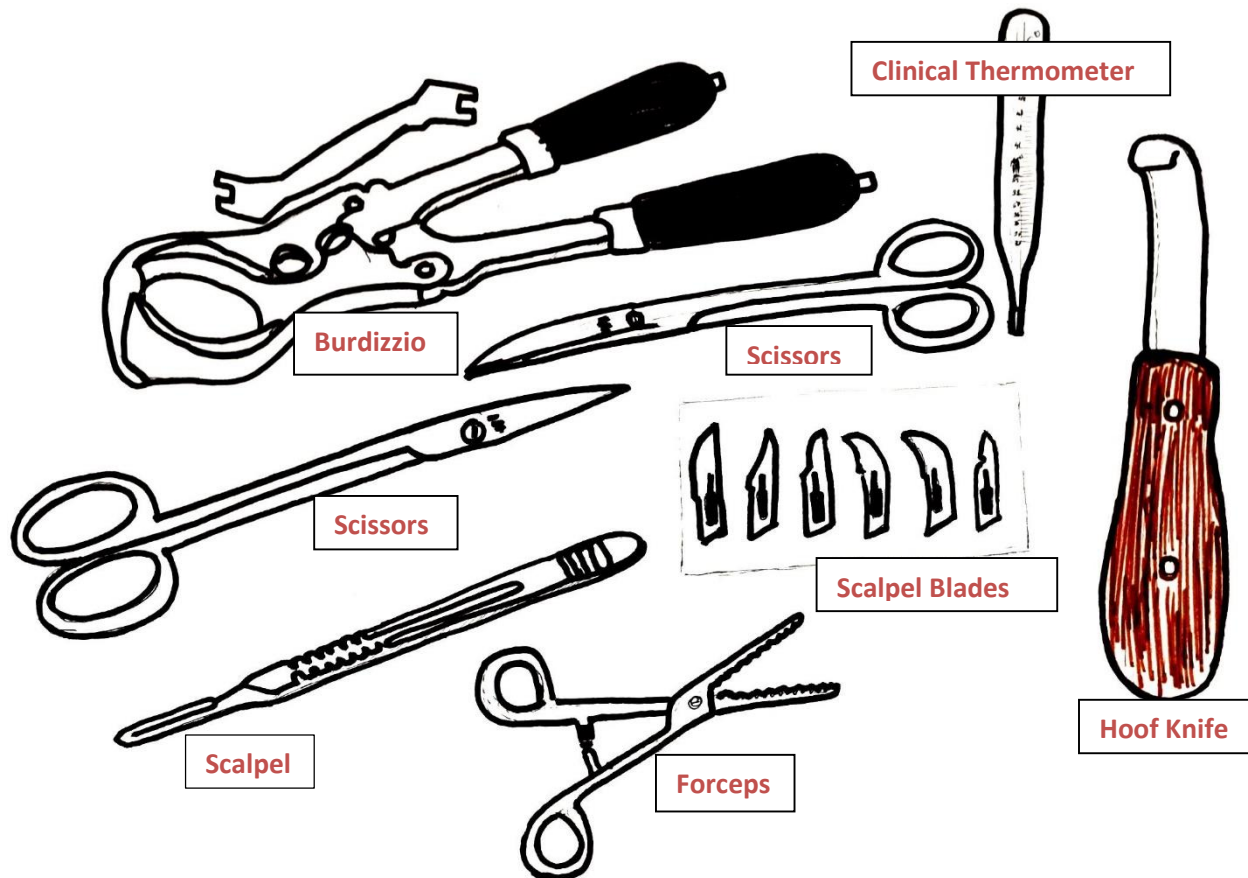
*See the illustration below*



**Subcutaneous injection**



## INTRODUCTION TO SURGICAL INSTRUMENTS



### Scalpel

**Use:** Used with scalpel blade

**How to use:** Fix the blade at the lock end of the scalpel

**What it is used for:** For opening abscesses, cutting and abrasions, opened castrations and cutting the placenta.

### Hoof knife:

**Use:** Used alone

**How to use:** Restraint the animal and use the hoof knife

**What it is used for:** For trimming the hooves with abnormal growth.

## **Burdizzo**

**Use:** Used alone

**How to use:** Restraint the male animal and use the burdizzo

**What it is used for:** Castration of bulls he goat and rams

## **Scalpel Blades**

**Use:** Used with scalpel

**How to use:** Fix the blade on the lock at the end of scalpel and use it once.

**What it is used for:** For opening abscesses, cutting and abrasions, opened castrations and cutting the placenta.

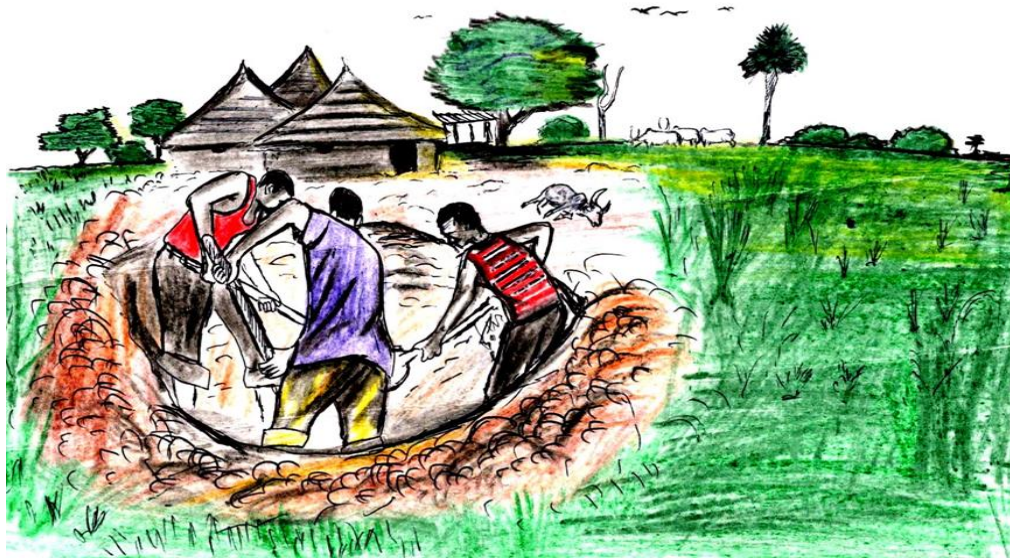
## **Scissors**

**Use:** Used alone

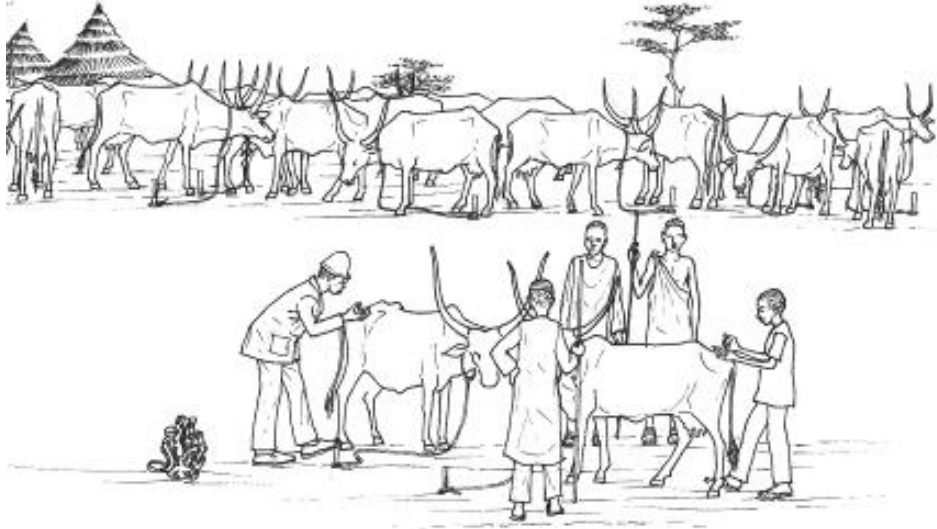
**How to use:** Hand tool;

**What is it used for:** Cutting tissues, cotton and hair

## **PREVENTION AND CONTROL OF DISEASES**



- Bury or burn dead animals



- Start treatment of sick diseases as early as possible

How to prevent diseases in animals?

- Vaccination, deworming and using acaricide
  - at least once per year
- Quarantine of newly brought animals, isolation of sick animals, even at water points or during pastures
- Good management; providing enough of water and feed, hoof trimming, clean environment

**How to prevent transmission of disease from animals to humans?**



- ALWAYS boil milk for 15 minutes before drinking




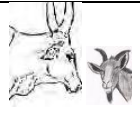

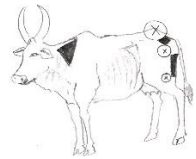



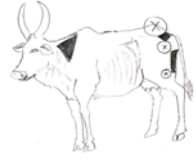


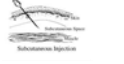




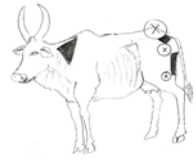



- NEVER eat meat from animal that was found dead
- NEVER use blowing of vulva to induce milking






## VACCINATION AND VACCINES

### Vaccination

The principle of vaccination is to prepare an animal for a future infection through activation of its immune system. The vaccine contains small amount of an infectious agent, which is inactivated – it does not cause disease, it only gives an information to the immune system about the properties of the pathogen. Based on this information, the immune system can create substances called antibodies, which later protect an animal against the infection.

### Some important vaccines

| Vaccine   | Vaccinated Disease | Animal  | Routes of Administration  | Sites on the animal  | Dose       |
|---|--------------------|---|---|--|------------|
|   | <b>Anthrax</b>     |   | <br>Subcutaneous Injection  |   | <b>1ml</b> |
|  | <b>Black Leg</b>   |  | <br>Subcutaneous Injection |  | <b>2ml</b> |
|  | <b>HS</b>          |  | <br>Subcutaneous Injection |  | <b>2ml</b> |
|  | <b>CBPP</b>        |  | <br>Subcutaneous Injection |  | <b>1ml</b> |
|  | <b>PPR</b>         |  | <br>Subcutaneous Injection |  | <b>2ml</b> |

|   |                          |   |   |            |            |
|---|--------------------------|---|---|------------|------------|
|  | <b>CCPP</b>              |  |  |            | <b>1ml</b> |
|  | <b>Newcastle Disease</b> |  | <b>Eye drop</b>   | <b>Eye</b> | <b>1ml</b> |

### Some important aspects of vaccination

|   |
|---|
| - Each vaccine protects only against one disease – i.e. vaccinated animals are protected against the particular disease, but not against all the diseases (vaccination does NOT mean that the animals will never die of any disease)  |
| - Animal owners should always be informed against which diseases are their animals vaccinated   |
| - Vaccination is safe for healthy animals from the age of 6 weeks. Newborn animals and sick animals should be excluded from the vaccination.  |
| - Vaccination is safe for pregnant cows   |
| - Milk and meat of vaccinated animals is safe for human consumption, even the first day after vaccination   |
| - Some animals might develop local reaction to vaccination – e.g. a swelling in the place of the injection. This is normal and will resolve spontaneously after some time. In case such animal is presented to you, observe the swelling and if it gets bigger or very hot, administer antibiotics. |
| - Most of the vaccines for cattle protects only for one year and vaccination has to be repeated afterwards.   |

### PRINCIPLES OF VACCINATION

1. Vaccine containing inactivated virus is injected in the body of the animal
2. The immune system of the animal starts creating antibodies to the inactivated virus.
3. Antibodies are specific to the virus in the vaccine.
4. The antibodies are multiplied and stored in the body of the animal
5. When the real virus come into the body of the animal, antibodies encircle it, based on their specificity.
6. The virus is dismantled due to the influence of the antibodies.

### HANDLING OF VACCINES AND VACCINATION EQUIPMENT

24hr/7

2-4 hrs





1. Vaccines are not stable in hot temperatures, they have to be kept in cold chain all the time, in temperatures 2-8 degrees.

| Vaccine |                   | ≤10°C | ≤20°C | 30°C | 40°C |
|---------|-------------------|-------|-------|------|------|
|         | Anthrax           | √     | √     | X    | X    |
|         | BQ                | √     | √     | X    | X    |
|         | HS                | √     | √     | X    | X    |
|         | CBPP              | √     | √     | X    | X    |
|         | PPR               | √     | √     | X    | X    |
|         | CCPP              | √     | √     | X    | X    |
|         | Newcastle Disease | √     | √     | X    | X    |

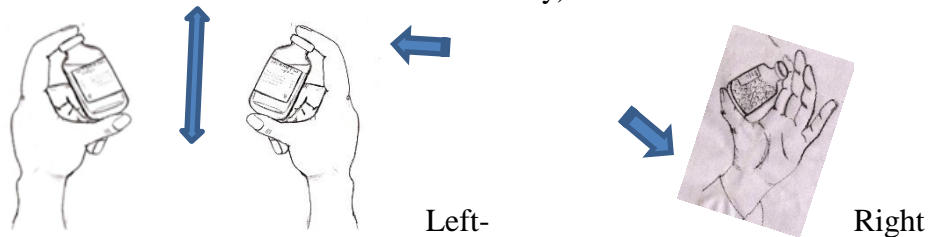
|  |   |
|--|---|
|  | <i>Vaccines are in good condition and the temperature should be maintained</i>      |
|  | <i>The vaccines are in a bad condition and should either be used immediately or</i> |

*taken back to the cold chain*  
*Vaccines should not be used. Taking them to the fridge does not help. Discard them*

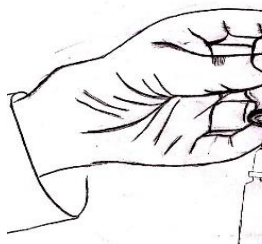
2. Vaccines that got warmed to 10-20 degrees should be used in next few days.
3. Vaccines that got warmed above 20 degrees are not effective and shall be discarded.



4. (It does not help when they are put again in the cold chain – cooling them down cannot restore their effectivity).



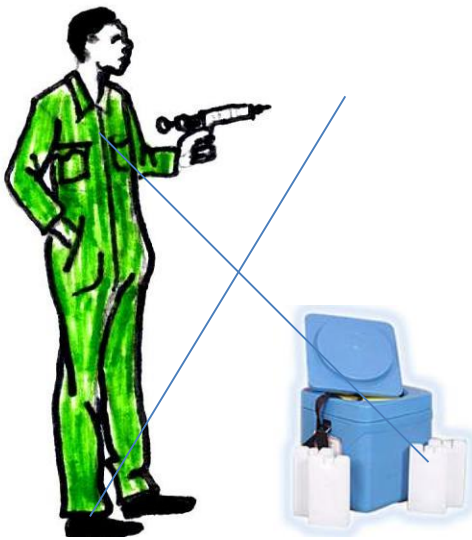
5. Every vial of vaccine shall be shaken well before it is plunged into the syringe.



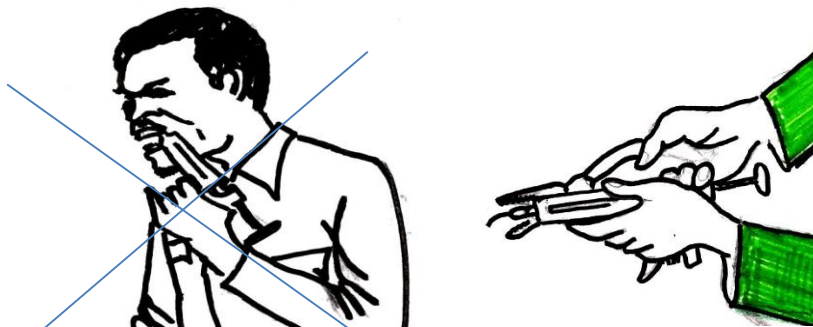
**Keep the vial upside down to inspire the medicine**

6. After withdrawing the vaccine into the syringe, the vaccine vial shall be immediately given back to a vaccine carrier.
7. Do not plunk the vaccine that remains in the syringe after vaccination
- 8. Vaccination equipment such as syringes, needles and vaccine carriers should be kept clean – wash them every evening with hot water, without soap**

### BAD PRACTICES DURING VACCINATION



*Figure 32: Do not put vaccines in your pocket, please put the vial back to the vaccine carrier and close it*



*Figure 33: Do not remove the bended or broken needle with your teeth. Use pliers or forceps to remove it safely*

### NOTIFIABLE DISEASES

A notifiable disease is a disease required by law to be reported to government authorities. The collation of information allows the authorities to monitor the disease, and provides early warning of possible outbreaks. There may also be the legal requirement to destroy the infected livestock upon notification.



The government further reports the occurrence of disease to international organizations such as (UN FAO), United Nation Food and Agriculture Organization and World Health Organization which collects the information from the whole Country and formulates countrywide applicable policies of disease control.

OIE lists 48 diseases which represent a risk to public health and world economy, including

- a. Anthrax
- b. Brucellosis
- c. Tuberculosis
- d. Foot and mouth disease
- e. Rabies
- f. Haemorrhagic septicaemia
- g. Sheep and goat pox
- h. Lumpy skin disease
- i. Trypanosomiasis
- j. Small ruminant plague
- k. Contagious caprine pleuropneumonia
- l. Contagious bovine pleuropneumonia

## COST RECOVERY

Contribution from the beneficiary



- 1) Cost of the service
- 2) Cost of transport
- 3) Cost of drugs and equipment
- 4) Labour

### Payments in cash or in kind



### Sustainability

- The policy of cost-recovery is a simple principle where the animal owner contributes to the overall cost of the animal health service provided to him by the community animal health worker. The contribution from the side of the owner helps the CAHW to purchase new drugs or tools and thus maintain the service.

### Why is cost-recovery important?

Cost-recovery is an important step from dependence on humanitarian organizations towards independent business. There are three ways how to provide animal health services to the community

- a) ***Subsidized*** – a third party (humanitarian organization or government) brings all the inputs and distributes them for free. This is very advantageous for the beneficiaries but it is not





sustainable (once the third party leaves, no services are provided anymore). In subsidized system, the costs are higher than the income from the services

- b) **Cost recovery** - the cost of the services is fully or partially recovered through contributions from animal owners. This helps to maintain the services even during the times when the third party is not present in the area.
- c) **Profitable business** - the contribution from the beneficiary exceeds the cost of the service; thus the service can continue without dependency on third party and CAHWs as the service providers can benefit from it.

### COMPONENTS OF THE VALUE

#### Number of animals treated from one component value per one Animal

Example of how to calculate the cost recovery

| Drugs   | Quantity | Unit   | Price | Total |
|---|----------|--------|-------|-------|
|  | 1        | Vial   | 600   | 600   |
|  | 1        | pieces | 100   | 100   |
|  | 1        | Trip   | 150   | 150   |
|  | 1        | Trip   | 150   | 150   |

|       |   |        |     |             |
|-------|---|--------|-----|-------------|
|       | 1 | labour | 200 | 200         |
| Total |   |        |     | <b>1200</b> |
|       |   |        |     |             |



Then the cattle owner will pay 300 SSP per

dose





Global Affairs  
Canada



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