Training manual for community animal health workers (CAHW)
South Kivu and Tanganyika provinces, Democratic Republic of the Congo

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Training manual for community animal health workers (CAHW)
South Kivu and Tanganyika provinces, Democratic Republic of the Congo

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International Livestock Research Institute

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Foreword

This manual was inspired by Brown's Field manual of animal diseases by syndromes which was used during a community animal health workers (CAHWs) training in South Sudan to identify—in a participatory manner—existing livestock diseases in the region. The future CAHW were able to identify from the photos prevailing diseases, to describe their clinical signs, their seasonal occurrence and in many cases also post-mortem findings. The traditional terms for the diseases could be related to the scientific names. Other references are Lebrun's Manual for community-based animal health workers and the four manuals by Oosterwijk et al. which all try to translate complicated messages into pictures.

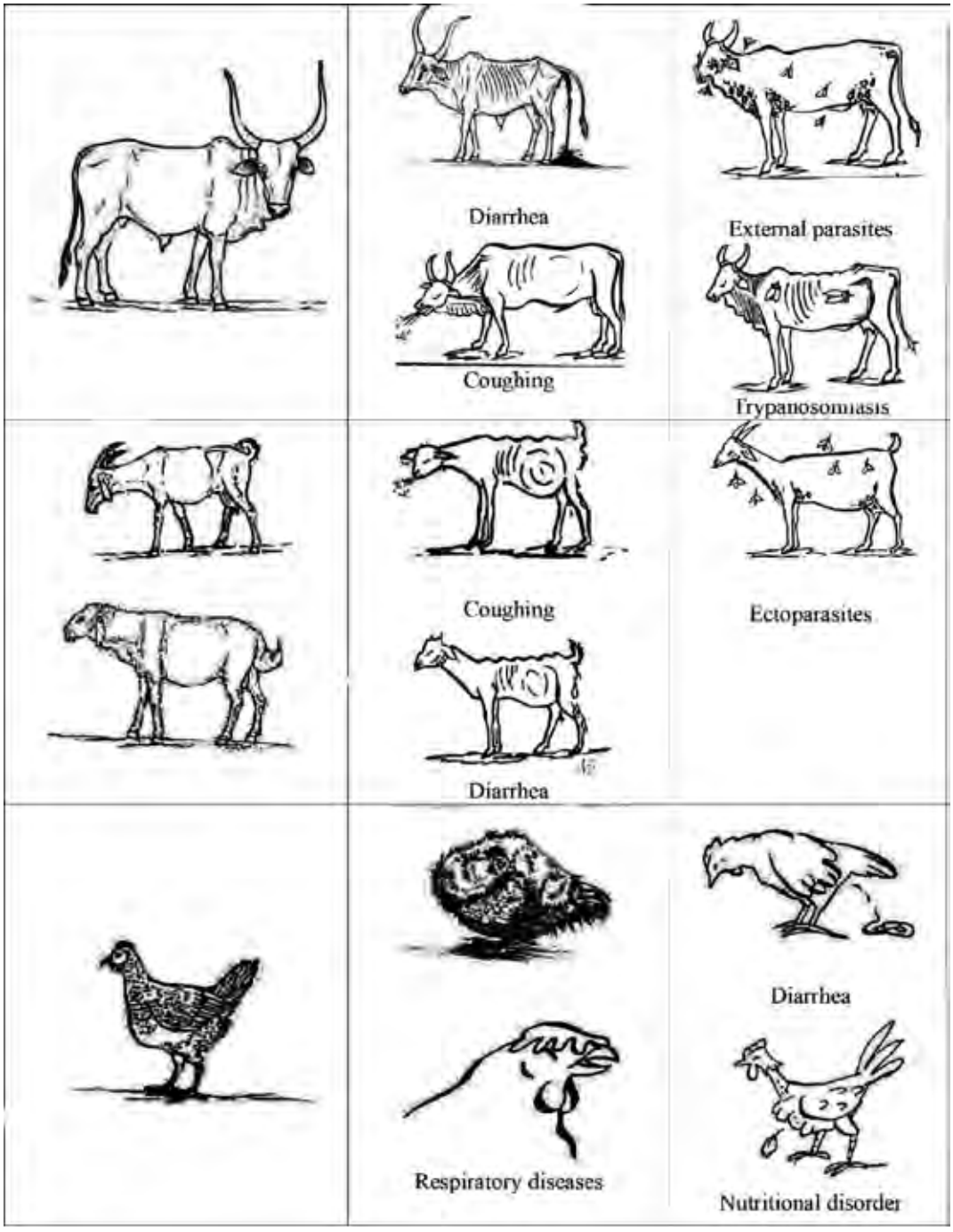
The present manual is a compilation of information from various sources. The intention was to gather the relevant information and compile a practical illustrated user manual for CAHWs in South Kivu and Tanganyika provinces of the Democratic Republic of the Congo, without any commercial interest. References to laboratory diagnosis have been deliberately omitted as such services are not available for remote CAHWs in the two provinces.

The goal of this manual is to provide the CAHWs with the necessary basic information to carry out their tasks. Therefore, the focus was on pictures which should allow a quick identification of an existing health problem and an immediate intervention within the limit of the drugs, equipment which had been handed out to the CAHWs at the end of their training. The manual also considers the educational background and the knowhow and skills of the CAHWs after their initial (basic) training. References to medicines under 'treatment' refer to generic names of the drug (active ingredients). Annex 2 provides a list of common drugs with brand names available in the sub-region. The brand names for some drugs are also given. In the future, there are plans to expand the manual with additional chapters and information—derived from the assessment of the difficulties encountered by the CAHWs during the refresher courses.

The Crop-livestock integration project (CLIP) jointly implemented by the International Livestock Research Institute (ILRI) and the International Institute for Tropical Agricultural (IITA), with the funding from the International Fund for Agricultural Development and the European Union, has carried out a survey on the most frequent livestock diseases in South Kivu province of the Democratic Republic of the Congo during 2017. This manual takes into consideration the finding of this survey.

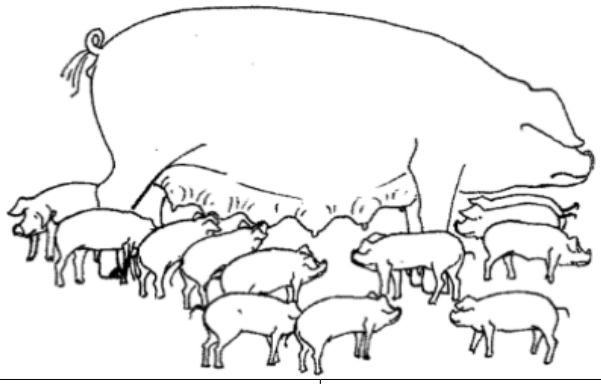
The composition of the kit is based on recommendations of the Food and Agriculture Organization of the United Nations (FAO). This kit can be also enlarged, for example, when additional activities are assigned to the CAHWs such as pigs or micro livestock like rabbits and cavies.

1. Healthy and sick animals[1]

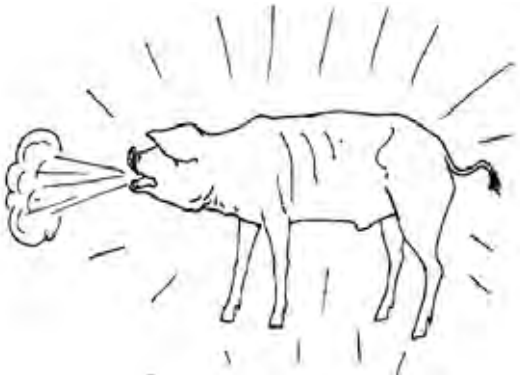


1. Drawings from Lebrun 2006.

Healthy sow with piglets

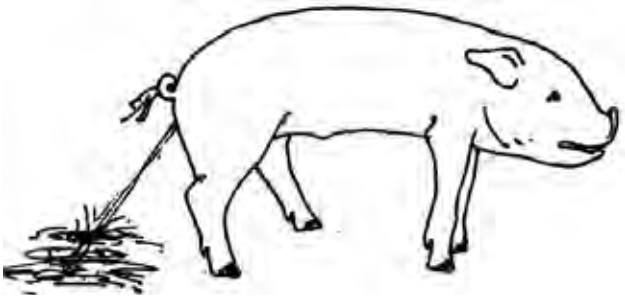


Coughing, sneezing, sniffing

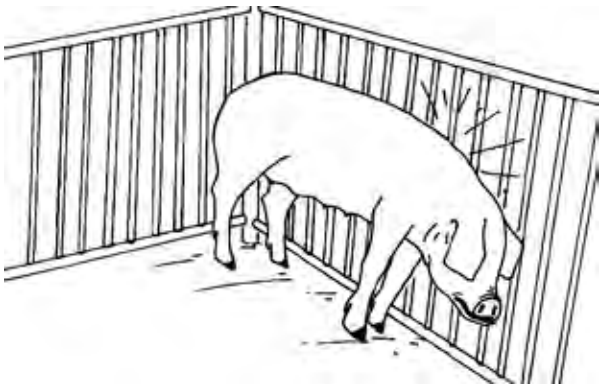


Internal parasites

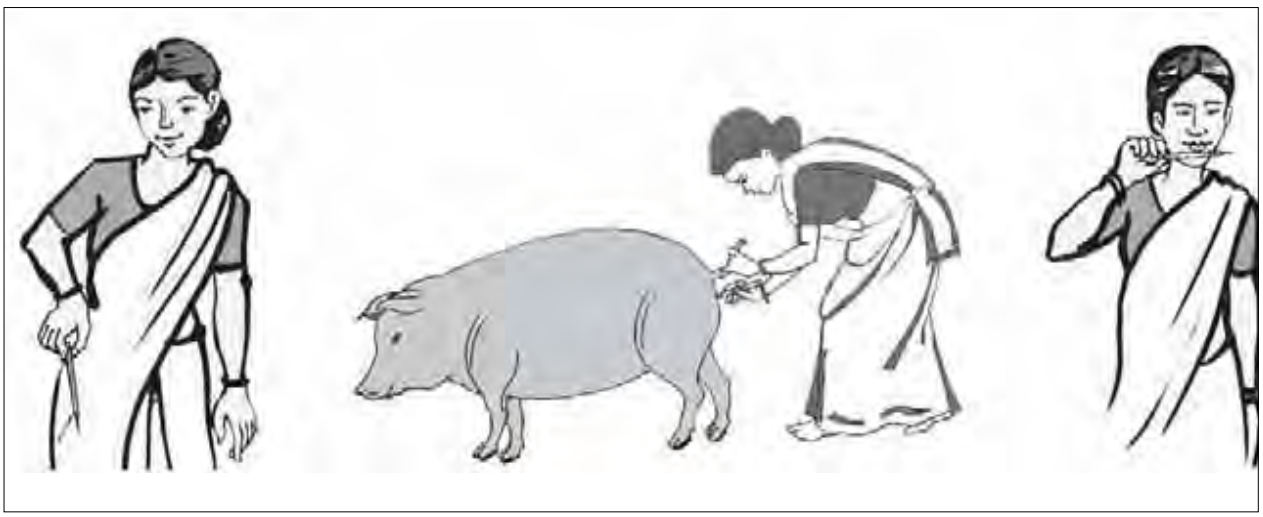
Piglet diarrhea



Pigs with mange



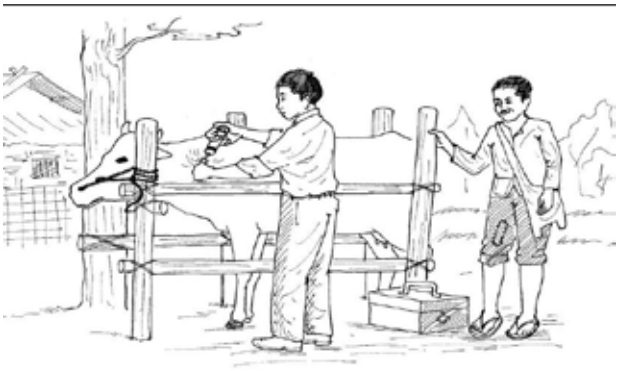
Taking the body temperature of animal (cattle, small ruminants , pigs, dogs)



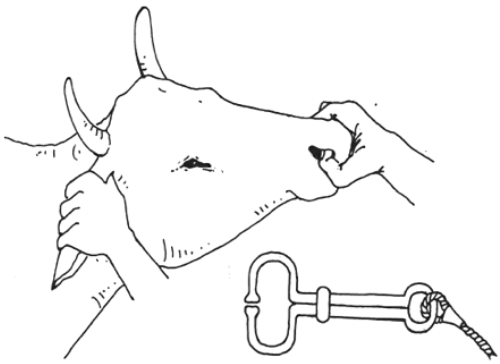
Normal body temperature (Lebrun 2006)
Cattle: 37.5 to 39.50 C
Sheep: 38.5 to 400 C
Goats: 38.5 to 40.50 C
Pigs: 38 to 40.50 C
Dogs: 35.5 to 39.50 C

2. Restraining of animals

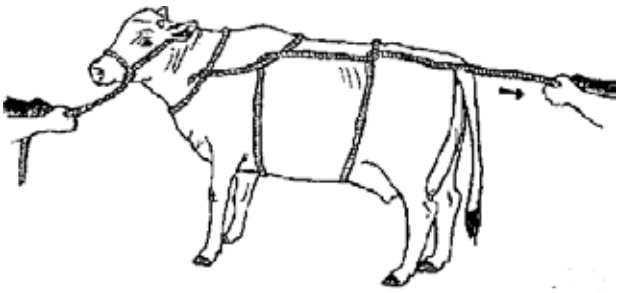
Cattle



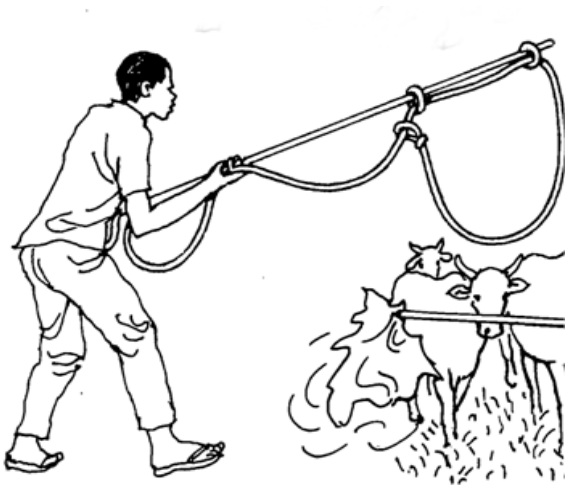
Hooves

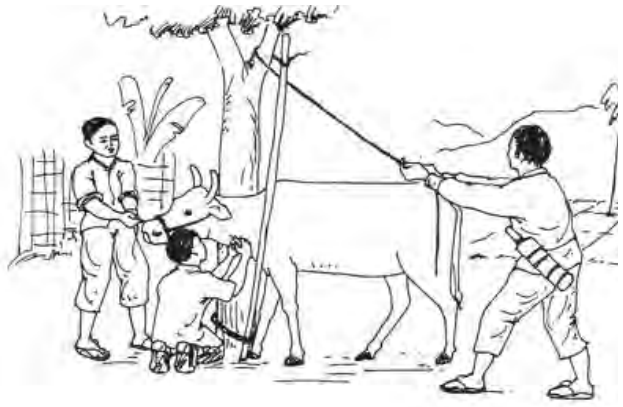
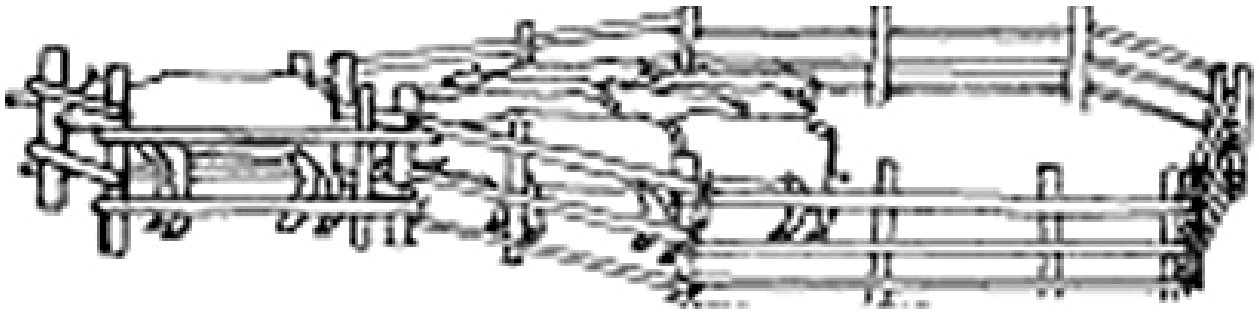
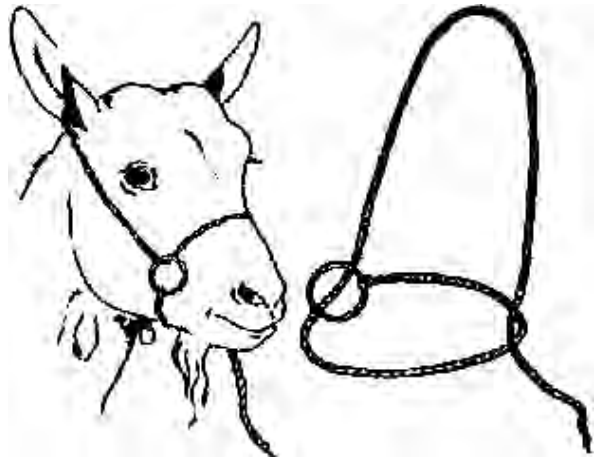
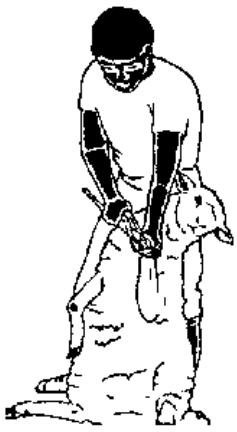
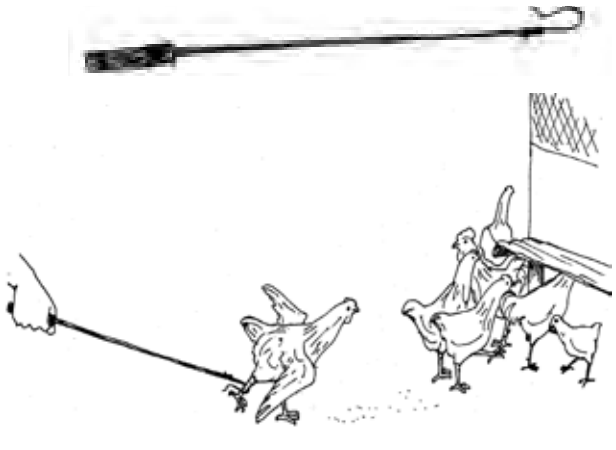


Nose



Disinfect



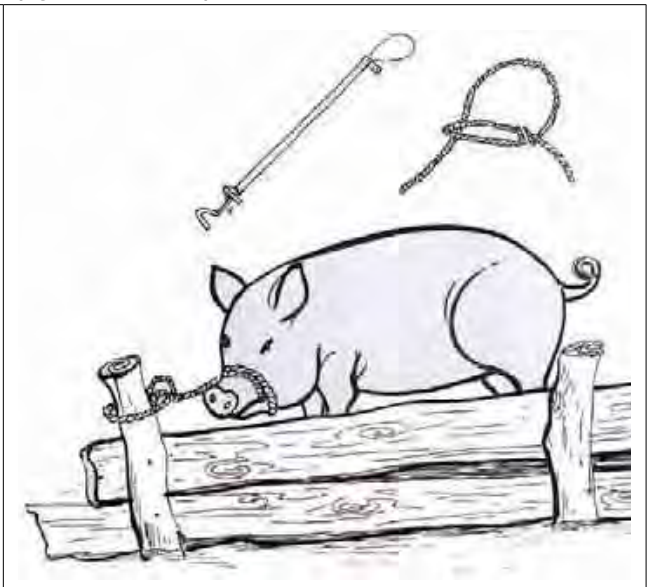
	Cut 
Crush for mass treatments like vaccinations 	
Goats 	Sheep 
Dogs 	Chicken 

Pigs

The technique described for cattle above: laying the animal on its side can also be used for sows

Restraining piglets by putting pressure on the back

A rope with a loop or a pig snare A pig snare is used to restrain large pigs. It consists of a cable or rope, which is passed through a tube and attached to a handle. To use a pig snare, the loop is loosened

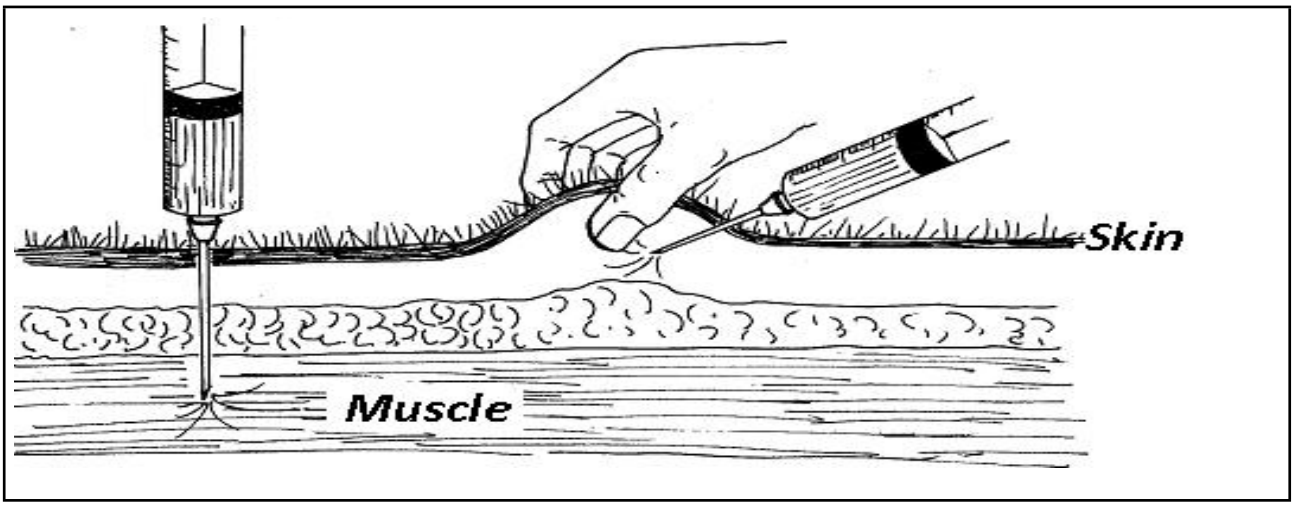


3. Principles of drug administration

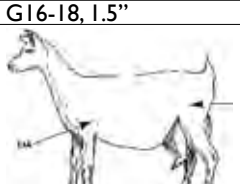
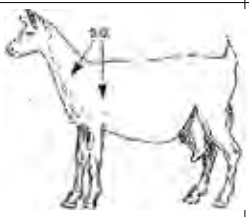
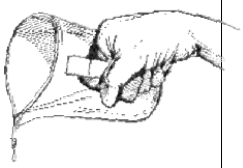
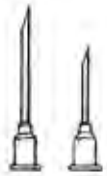
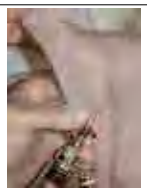
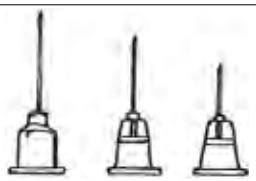
3.1 Intramuscular (i.m.) and subcutaneous injections (s.c.)

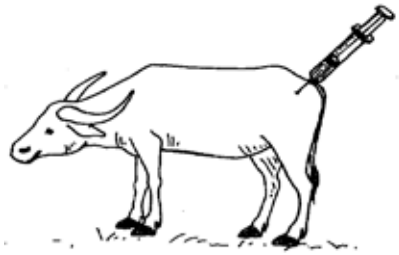
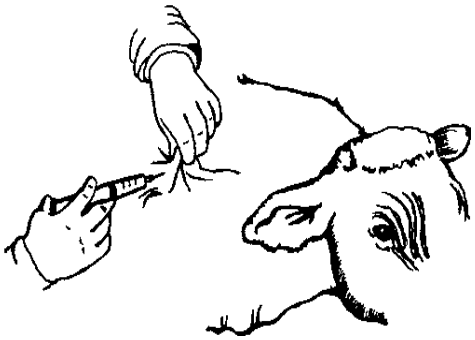
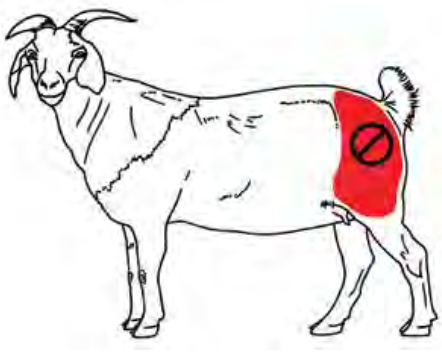
Remember that before you make any injection you should:

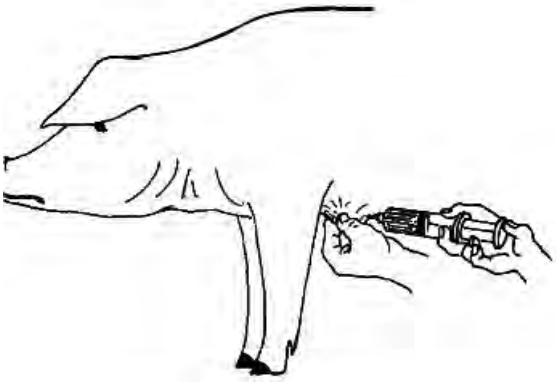
- Pick an area of skin free from faeces or mud
- Use a clean sterilised syringe and properly fitted needle
- Make sure your hands are clean



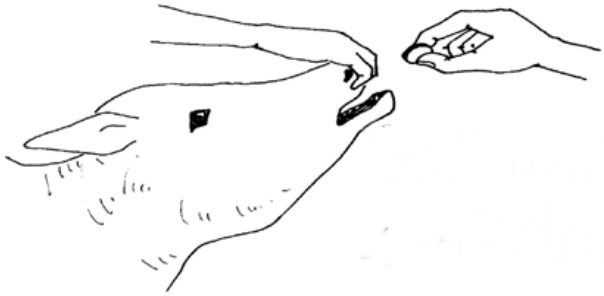
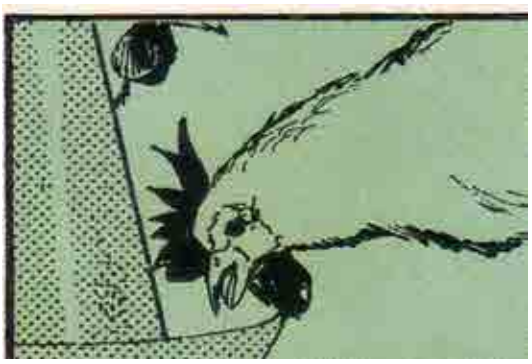
How to give injections (locations and needle sizes)

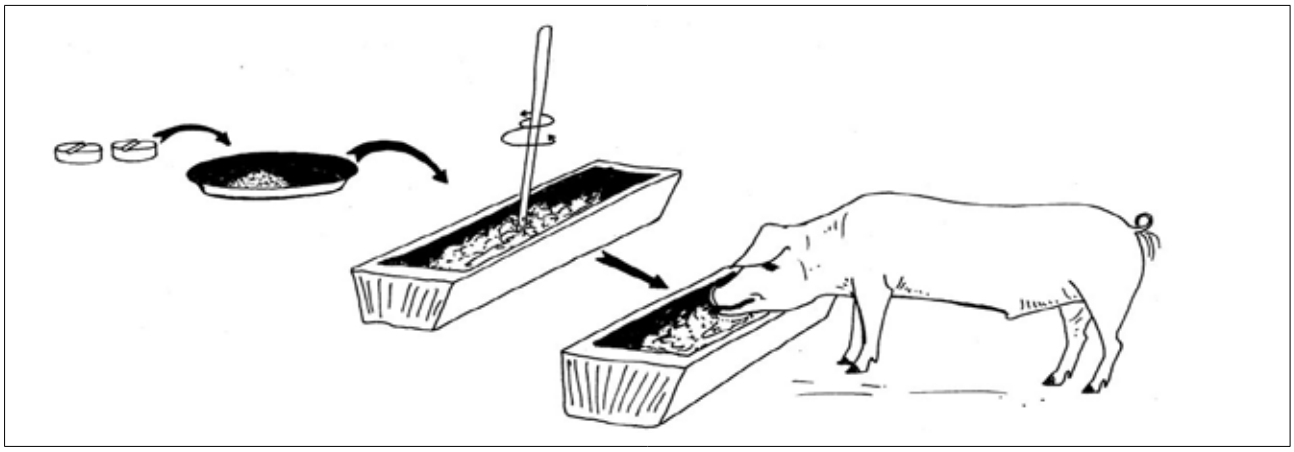
Needle	Cattle	Shoats	Dog	Poultry
	G 16-18, 1.5"	G16-18, 1.5"	G 18-20, 1.0"	G20-21, 0.75"
Intramuscular i.m	Remove		Disinfect	Images: Ali 1994
Needle	G 16-18, 1.0"	G 16-18, 1.0"	G 16-18, 1.0"	G 16-18, 1.0"
Subcutaneous s.c.				
Needle	Pigs	Piglets	1.5".& 1"	1"
	G 18-20, 1.5"	G 16 to 20, 0.5 to 1" according to size	G 16 - 18	G 18 - 20
Intramuscular i.m				
Needle	G 18-20, 0.75"	G 16 to 20, 0.5 to 1" according to size	1 " 0.75" 0.5"	
	Under the skin of the neck behind the ear		G 20 - 21	
Subcutaneous s.c				

Intramuscular in cattle and shoats	Intramuscular in poultry
	
Subcutaneous injection technique in cattle	Never inject in the hind quarter
	

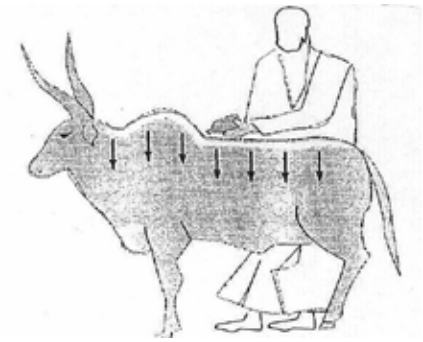
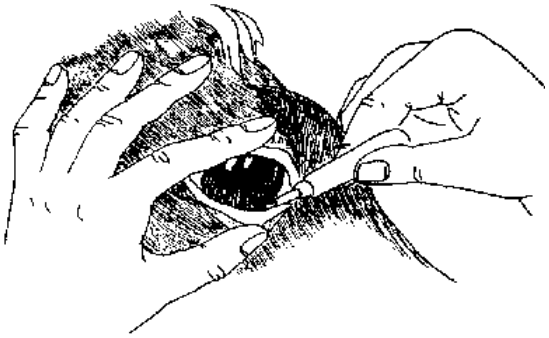
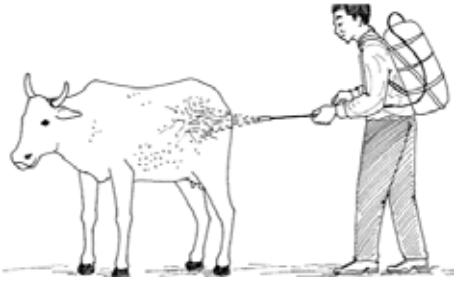
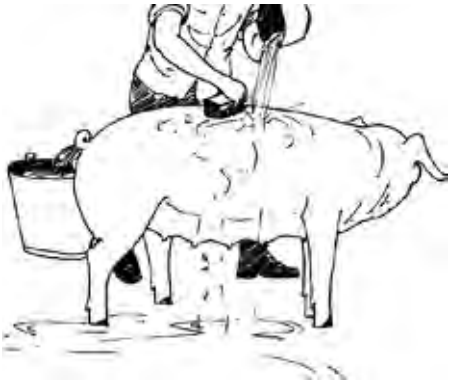
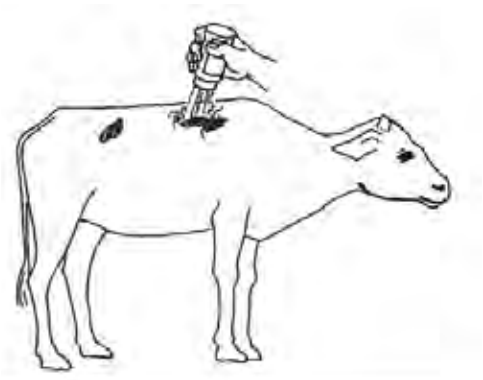
Subcutaneous injection	Intramuscular injection in the neck
	

3.2 Oral administration (drenching) or bolus application

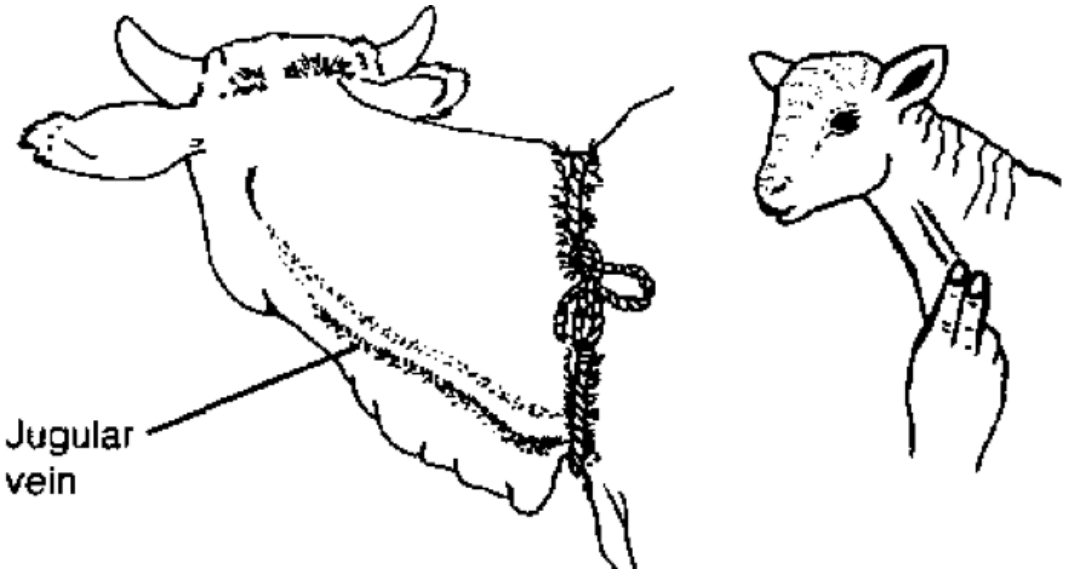
	
Administration of a liquid with a bottle	Drenching
	
Bolus administration	Poultry: through drinking water
	



3.3 Local administration

Spot (pour) – on	Eye treatment
	
Spraying: Products to treat external parasites are toxic. Always wear gloves and a mask covering nose and mouth	
	
Washing of a sow (against external parasites)	Application of powder to dust wounds
	

3.4 Intravenous injection (i.v.) or blood sampling



Blood sampling in older cattle from the tail vein

Blood sampling in pigs from the ear veins

4. Vaccination and vaccines

4.1 General information and remarks

Vaccination has a greater effect in controlling mortality in livestock than any other measure.

General information on vaccination campaign

- Handle vaccines requiring cold chain storage with recommended storage temperature written on the bottle or leaflet supplied by the manufactures.
- Transport vaccines from fridge to field for vaccination campaign in a portable fridge or cold boxes and vaccine carriers having freeze icepacks to keep vaccine viable.
- Use all vaccines before expiring dates
- Constituted vaccines or open bottles of vaccine must be kept under dark or shade away from sun light and must be used in two hours only

- Recommended needle to use for all subcutaneous vaccine injections: G 14"–15" and 0.5" in length
- Ensure all vaccination equipment required for smooth delivery of campaign are available before conducting vaccination campaign
- Trained vet personnel to handle vaccination of the animals
- Involve all stakeholders in a participatory meeting and agree on roles and responsibilities of each member for better delivery of vaccination campaign.
- Share available information on type of vaccine, disease to vaccinate against it, limitation of the vaccine and any possible reaction after inculcation to prepare the livestock owners in advance

- Apply proper hygienic measure during vaccination to reduce contamination with other pathogens
- Follow up or monitor vaccination campaign immediately is very important for documentation and experience building.
- Follow the instructions written by the manufacture for correct dosage and proper uses of vaccination for animal population intended for

Only vaccinate healthy animals!!!!

Simultaneous vaccination against Anthrax, Blackquarter and haemorrhagic septicaemia is possible.

Reconstitution of freeze-dried vaccines

1. Reconstitute the vaccine with a diluent (normal saline solution).
2. Store reconstituted vaccine in melting ice.
3. Do not expose to sunlight.
4. Reconstituted vaccine to be used quickly (preferably within 1 (one) hour).
5. Do not mix with other products

4.2 Type of vaccines used for vaccination campaigns

Vaccination campaigns are organised by the public veterinary health services which also provide the necessary vials and diluents (distilled water or saline solutions). CAHWs may be charged to collaborate in vaccination campaigns. In general, only vaccinations against poultry diseases are organised by CAHW jointly with the community in which they work. If possible heat stable vaccines (vaccines which do not require cooling should be used for convenience reasons).

Details can be found on the website of Kevevapi (the Kenyan Veterinary Vaccine Production Institute (https://kevevapi.org/index.php/our-products).

For cattle

HS-vaccines 50 doses for cattle and 100 doses for shoat is a solution ready to use

- Stored at +20 C to +80 C
- Do not freeze
- Keep in the dark, avoiding light
- Shake well before use
- Dosage:
  - Cattle: 2–5 ml
  - Shoat: 1–2 ml
- Site of administration: in the neck under the skin (subcutaneous)

Black quarter (BQ)-vaccines 50 dose, ready to use- inactivated adjuvanted vaccine,

- Stored at +20 C to +80 C
- Do not freeze
- Shake well before use
- Dosage: inject 2–5 ml per dose
- Site of administration: in the neck, under the skin (subcutaneous)

Anthrax vaccines 100 dose in solution

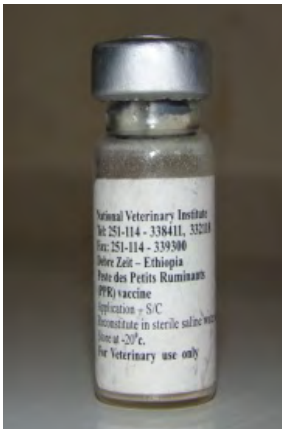
- Stored at +20 C to +80 C
- Do not freeze
- Shake well before use
- Dosage: inject 2–5 ml per dose
- Site of administration: in the neck, under the skin (subcutaneous)

CBPP vaccine 100 doses—CBPP types T1-44 and T1-SR: live attenuated vaccine

- This is freeze dried vaccine.
- Stored at -2^0 C
- Store in freezer,
- Uses diluents, mix in 100 ml diluent
- Inject 1 ml/dose under the skin of the neck (subcutaneous)
- Do not vaccinate infected herds
- Sometimes swelling on vaccination site may appear.

For goats and sheep

Pestevac NIG. 75/1 strain live attenuated vaccine against peste des petits ruminants (PPR) from Jordan



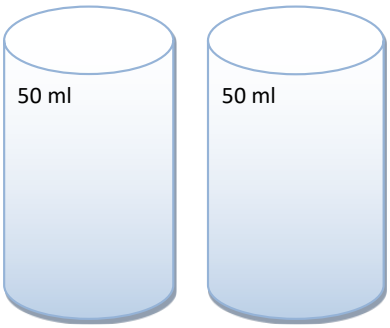
- This is freeze dried vaccine.
- Stored at -20 0 C
- Uses sterile saline solution diluent,
- Inject 1 ml
- Site of administration : under the skin of the neck (subcutaneous

PPR-vaccines 100 dose vial from Ethiopia

- This is freeze power dried vaccine.
- Stored at -20 0 C
- Uses sterile saline solution diluents,
- Mix in 100ml diluents
- Inject 1 ml dose under the skin of the neck
- Site of administration : under the skin of the neck (subcutaneous)

How to prepare the PPR vaccine: when 50 ml bottle of diluents is supplied

- Draw 2 ml of sterile saline solution from each of the bottles.
- Add to the same vial of the freeze-dried vaccine
- Shake slowly for it to dissolve,
- Transfer into each of the 50 ml bottles of saline solution, 2 ml of the vaccine



Sheep and goat pox vaccine

- This is freeze dried vaccine.
- Stored at $+2^0$ C to $+8^0$ C
- Uses diluents,
- Inject 1 ml/dose under the skin of the neck (subcutaneous)

For goats only

CCPP vaccine 100 dose vial

- This is freeze dried vaccine.
- Stored at +20 C to +80 C
- Uses diluents,
- mix in 100ml diluents
- Inject 1 ml/dose under the skin of the neck (subcutaneous)

For dogs/cats

Rabies vaccine 10 dose (like Rabisin)

- Inactivated vaccine.
- To be kept in refrigerator at $+2^0$ C to $+8^0$ C (do not freeze).
- Do not vaccinate dogs or cats which are suspicious of having rabies.
- A vaccinated dog/cat becomes only immune about 1 month after vaccination

For chicken

Newcastle disease vaccine

There are two types available

- attenuated live vaccine,
- freeze dried,

1. For eye drop application, keep in freezer , can be kept in refrigerator for one months
2. A thermostable variant can be kept in a dark place by temperature below 28^0C for one months
3. For drinking water administration Newcastle La Sota:
    - Vaccines to be stored in freezer, storage in refrigerator for maximum one month,
    - reconstituted vaccine must be used within two hours

For pigs

The economically most important disease is African Swine fever against which – until today – no treatment and no preventive vaccine exists

Vaccines which can be used for several species

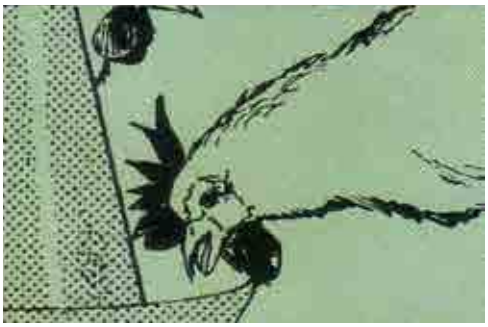
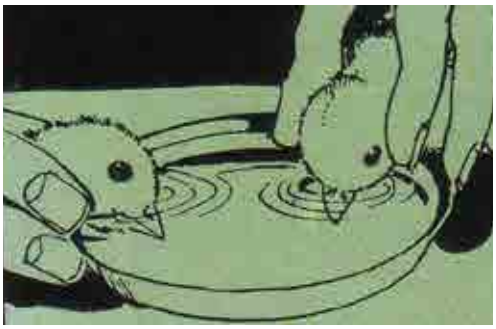
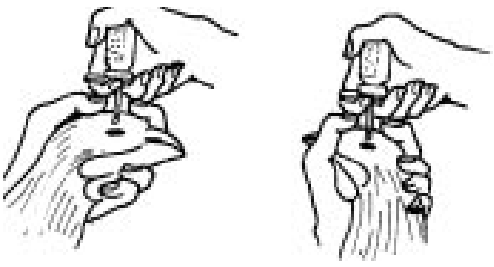
FOTIVAX inactivated foot-and-mouth disease (FMD) vaccine

For the vaccination of healthy cattle, pigs, sheep and goats in the prevention and control of FMD caused by the serotypes A, O, SAT 1 and SAT2.

Composition FOTIVAX is a FMD vaccine preparation containing chemically inactivated, tissue culture derived FMD virus strains A, O, C, SAT1 and SAT 2. The usual blend of FOTIVAXTM contains FMD strains A, O, SAT1 and SAT2

	Store at +4°C (refrigerator). Do not freeze. If stored at between +2°C +8°C (refrigerator) the shelf life is one year. Once the vaccine bottle has been broached, it must be used immediately and any remaining quantity discarded. 50-, 100-, and 300-ml vials

4.3 Administration of vaccines in poultry

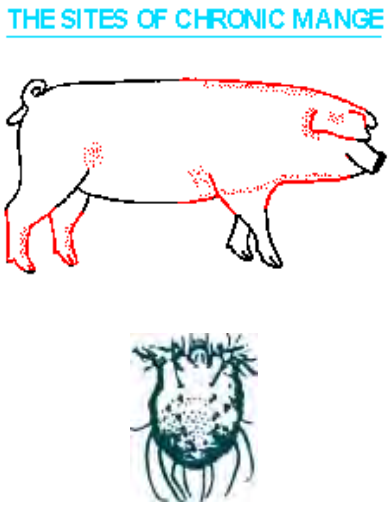
	Administration through drinking water. Prior to the administration do not water chicken for 2 to 3 hours
	Dipping for chicks under three weeks of age
	Eye drop administration Usually two drops (one drop in each eye) When using an eyedropper to administer a vaccine, hold it in a vertical position. Do not touch the eye with the tip of the dropper.

5. Livestock diseases by symptoms and treatment

5.1 External parasites

Louse	Flea	Ticks
		
Mange mite (from 10) • Itching : animal rubs against trees and posts; skin becomes red • Often starts on head and neck,	Biting insect (see also Trypanosomiasis hereafter)	Chicken lice
		

Ticks	Warble fly larvae	Dermatophilose
		

Scabies/mange in pigs	
	

Treatment:

Acaricides cannot kill larvae, hence at least two treatments are necessary

Cattle: Ectopor pour on, Norotraz 12.5% solution (requires a knapsack sprayer

Sheep and goat: Ectopor pour on, Norotraz 12.5% solution (requires a knapsack sprayer

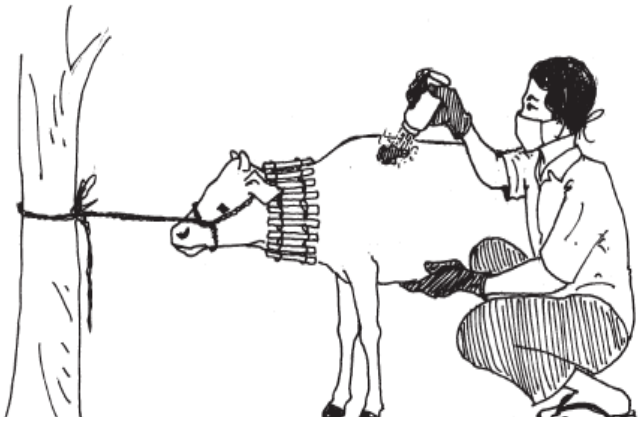
Poultry: Louse powder

Dogs: Amitraz

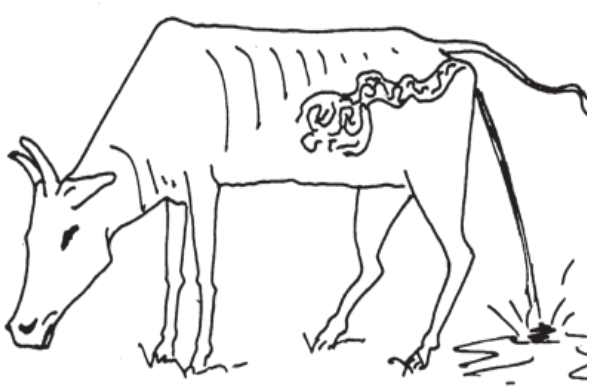
Pigs: Spray, pour-on or washing of adult pigs

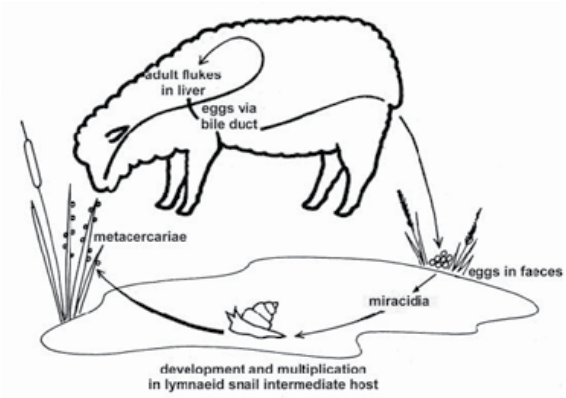
Ivermectin 1% solution can be injected to treat simultaneously external and internal (worms) parasites to cattle, small ruminants and pigs.

Beware: Some insecticides/acaricides are dangerous for humans. The use of plastic gloves and masks covering nose and mouth is necessary. Wash yourself after treatments.

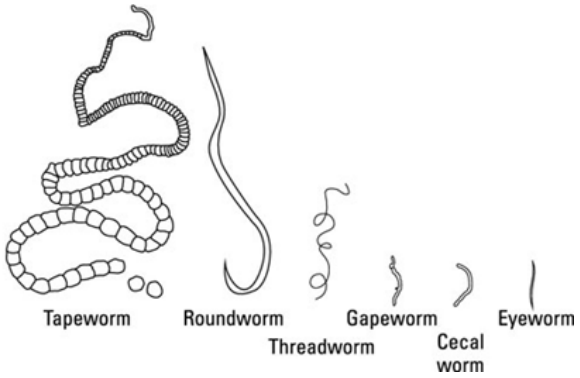
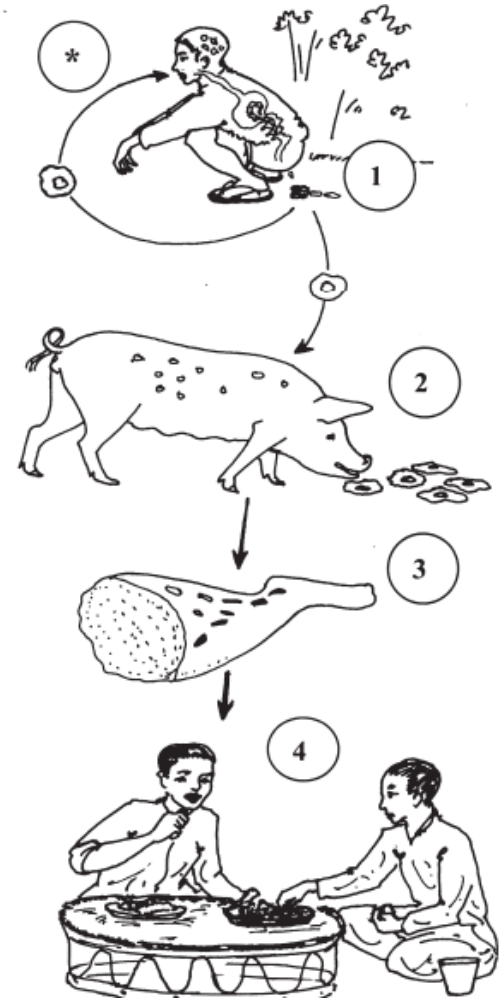
This signs on containers with chemicals shows the product is toxic	Correct use of gloves and mask, sometimes the use of protective goggles can be indicated e.g. when spraying animals
	

5.2 Internal parasites

Internal parasites (worms)	Liverflukes (distomatosis)
	

Gut worms	Liver fluke cycle
• Usually in wet season. • Usually in young animals • Normal body temperature • Swelling under the jaw (“bottle”-neck). • Normal appetite. • Pale membranes. • Diarrhoea (334) • Belly may appear swollen. • Rough coat. • Poor growth	Livestock get infected with liver fluke when grazing in swampy areas in which you find the snails below
	

Clinical signs	
Swelling under the jaw (“bottle”-neck). Swollen lower parts (belly and limbs).	

Worms in chicken	Round worms in poultry
	
Local pig with worm infestation	Free ranging pigs can catch worms everywhere
	Pig tapeworm (Taenia solium) can also be found in human faeces
	Porcine cysticercosis. a zoonosis (a disease which can be transmitted to humans People can become infected by ingesting tape worm eggs, either directly or by eating food that is contaminated by human faeces. This happens when food is touched by a person who has the tapeworm and who is not washing her/his hands before handling food. When people ingest tapeworm eggs, cysts may develop in different parts of the body, e.g. the brain. If cysts develop in the brain, they will cause nervous disease. 1. Adult tapeworms live in the human intestine and produce eggs. 2. The pig eats the tapeworm eggs in the human faeces. 3. Cysts develop in the pig muscle. 4. When a person eats poorly-cooked meat with cysts, tapeworms can develop in the intestines

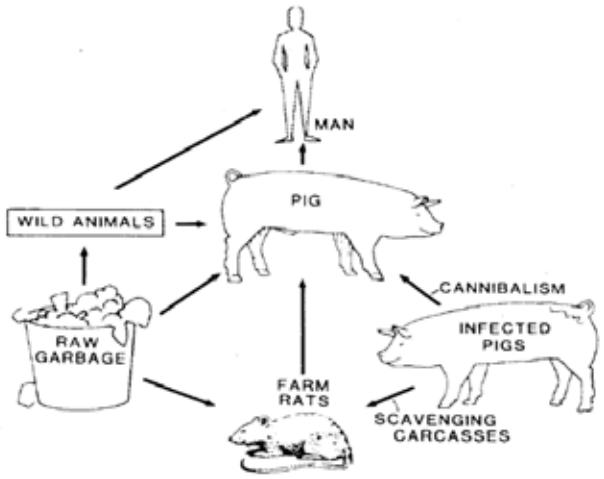
Treatment:

Dose the entire herd with albendazole, fenbendazole, or mebendazole, twice a year in the early wet and early dry seasons, even though they appear healthy.

Ivermectin can be injected to cattle, pigs and small ruminants.

Chicken: use an appropriate dewormer. Check the instruction on the label or leaflet if the product can be used for chicken

Prevention of worm infestation: Regular cleaning of pens, stables and chicken houses, regular deworming.



Trichinosis is a zoonosis caused by the muscle worm Trichinella spiralis

The image shows the cycle of transmission

There is no practical treatment for the cysts of trichinella in pigs. The cysts can be detected during meat inspection, pork should always be cooked to kill the cysts

5.3 Skin diseases

In addition to external parasites other skin lesions can be found. They can be caused by pathogens but also have other causes including nutritional deficiencies

Lumpy skin disease (LSD): More details in Chapter 7

Papillomatose (see ORF below)

Lumpy skin disease	Papillomatose
	

Photosensibilization

Often caused by feed (poisonous plants)
More frequent in animals with white coat
Keep affected livestock in the shade
Avoid secondary skin infection and fly strike

Sunburn in white pigs

Ringworm

Ringworm: transmissible infectious skin disease caused by fungi. The disease is transmissible. Waring gloves during treatment is necessary. Important is to remove crusts before treatment through scraping or washing. Topical treatment e.g. sodium hypochlorite solution like Clorox® , iodine, Captan®. Farmers often apply used engine oil on lesions

Pigs skin lesions

Severe scabies /mange in pigs

Diamond skin lesions (Erysipelas)

Skin lesion in poultry

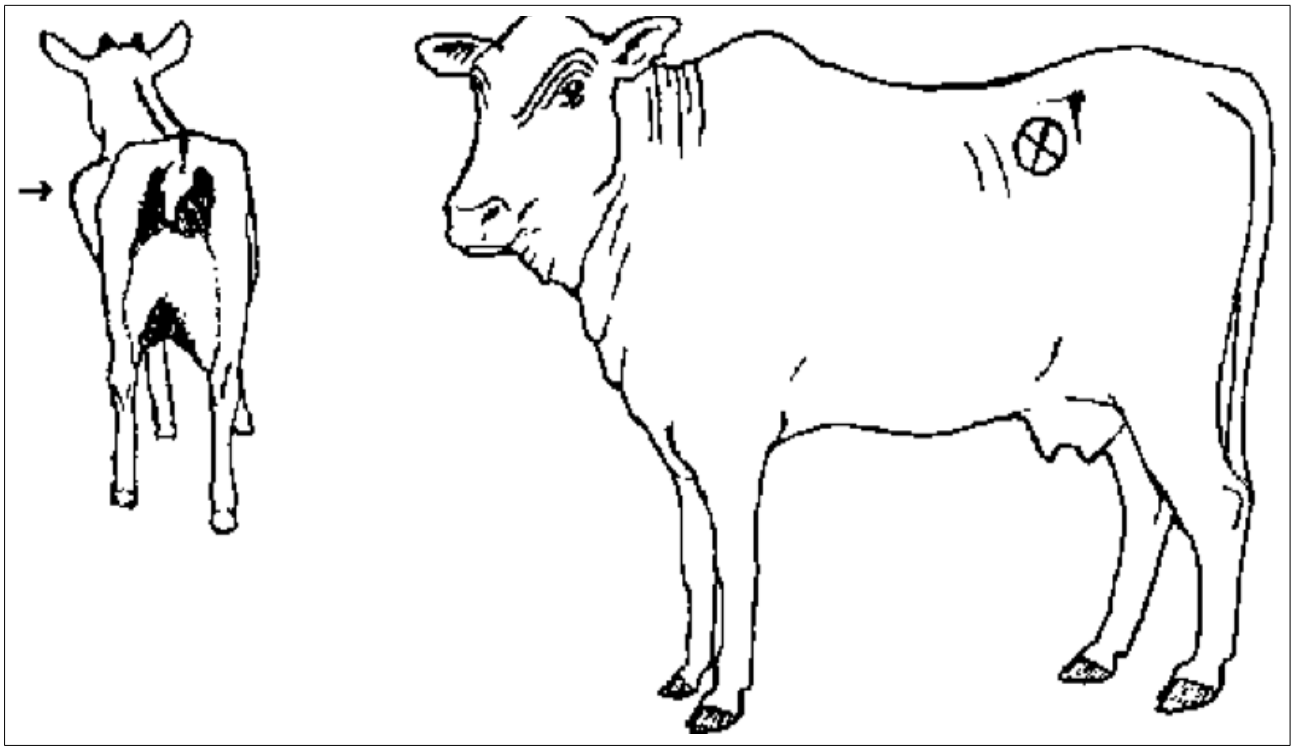
- Feather loss and cannibalism
- Reasons :
- Molting is natural loss of old feather and growth of new ones
- Overcrowding
- Boredom
- Nutritional deficiencies (protein, sodium)
- External parasites

5.4 Digestive system

In addition to diarrhoea caused by internal parasites (worms) other digestive disturbances can occur like

Bloat

Bloat is simply the build-up of gas in the rumen. This gas is produced as part of the normal process of digestion and is normally lost by belching (eructation). Bloat occurs when this loss of gas is prevented. There are two sorts of bloat. The least common type is gassy bloat, which occurs when the gullet is obstructed (often by foreign objects such as potatoes) or when the animal cannot burp (such as with milk fever or tetanus). The second type of bloat is frothy bloat, which happens as the result of a stable foam developing on top of the rumen liquid, which blocks the release of the gas. This is by far the most common form of bloat, and unlike gassy bloat, it is highly seasonal with peaks in the spring and autumn. This is because the foam is formed by breakdown products from rapidly growing forages. These increase the viscosity (stickiness) of the rumen fluid and prevent the small bubbles of gas formed by rumen fermentation from coming together to form free gas that can be belched of. (Image: Ali 1994)



Treatment:

Prepare a drench with either

- A small amount (50ml) of kerosene (paraffin) in 2 litres of water
- A small bottle of peanut, soya or linseed oil (500ml) mixed with 500 ml of water.

In very severe cases, puncture the left flank with a sharp knife at the level marked with an X

5.5 Respiratory system

Coughing and nasal discharges are the most common signs, many of these symptoms may indicate the presence of infectious disease like CBPP ,CCPP, HS (see in Chapter 7) or the presence of worms in the lungs

Sneezing :A sneeze is a strong, forceful expiration through the nose. It can be caused by an infection of the inside of the nose or from maggots of the nasal fly

Treatment: In cases of an infectious disease: antibiotics (Oxythetracycline 29%) , in cases of lungworm infection or the presence of maggots of nasal fli8es: : deworming with Albendazol

5.6 Reproductive system

Parturition/calving

Normal calving:

Head and both legs emerge at the same time

Difficulties in calving

(1) Only the head of the calf has appeared.

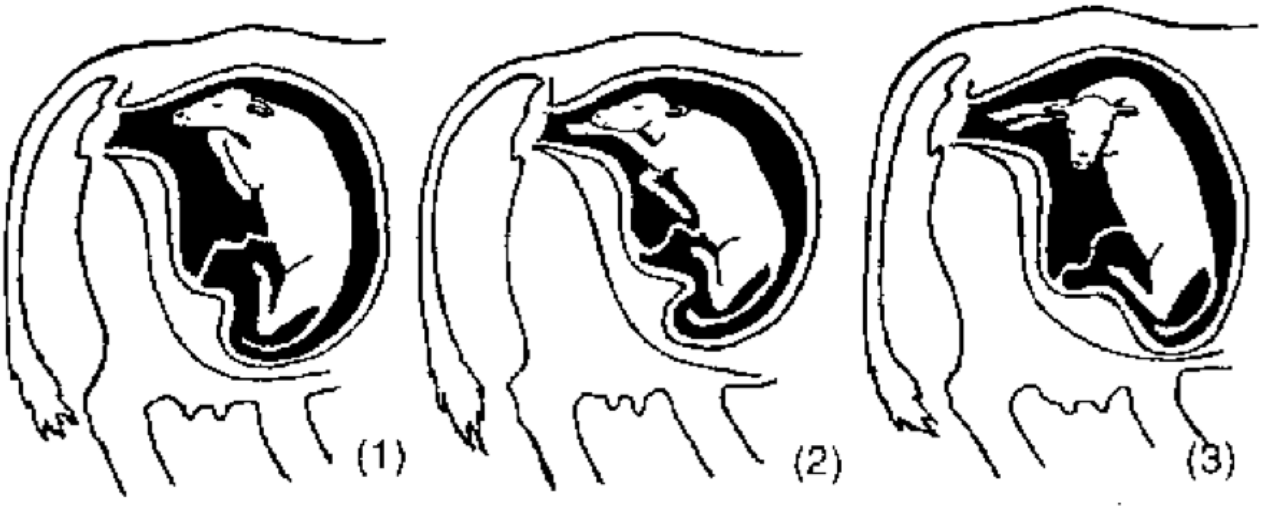
(2) The head and one foot has come out.

(3) Two front feet showing but no head.

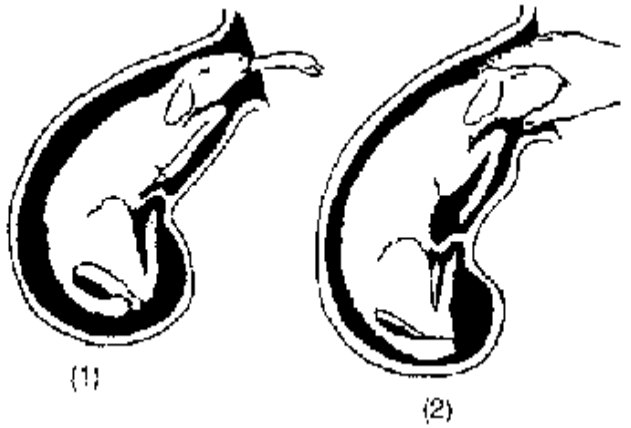
(4) In some cases, the hind quarter emerges first

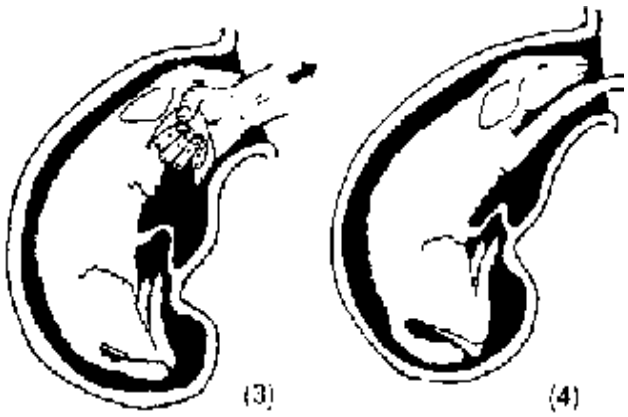
All images: Ali 1994

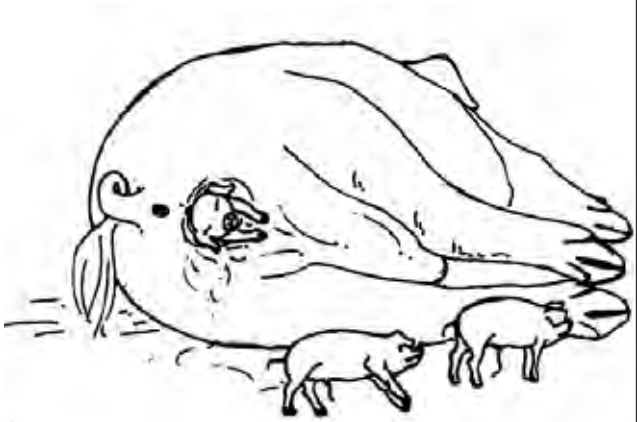
Difficult lambing/kidding and possibilities to intervene



Parturition/farrowing in pigs







Piglets should be born at regular intervals of approximately 10–15 minutes. If there is more than one-hour interval, there is a potential problem. Observe the belly for any movements of not yet born piglets.

When you observe or assume problems with the birth of the piglets, you need to do a vaginal check. Sometimes piglets can be stuck, and the farmer can gently assist these piglets to be born.

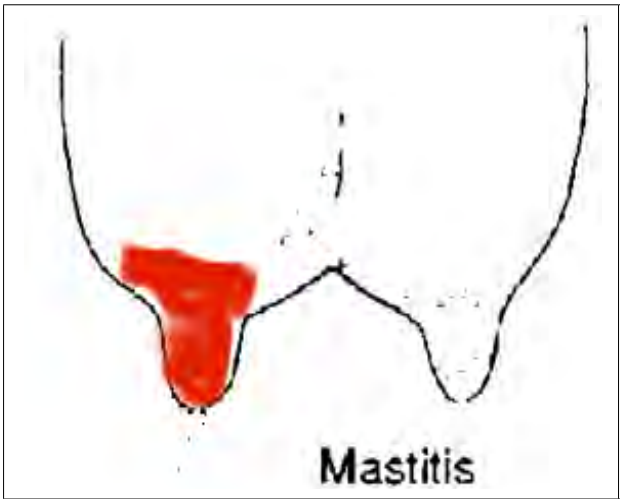
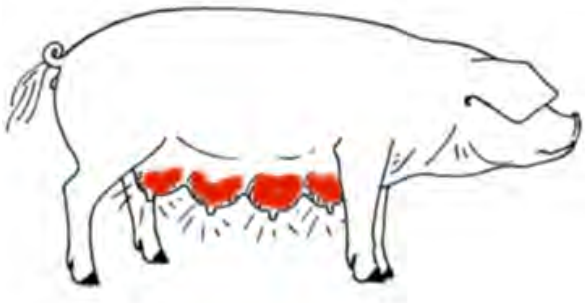
Before any vaginal-check, you need to wash your hands and arms thoroughly with soap.

Clip nails short and remove any dirt under the nails. By not observing strict hygiene standards, the uterus can easily become infected.

Be sure the sow cleanses completely within 1 hour after the last piglet was born or a uterine infection may result.

Udder

Mastitis in cattle and small ruminants

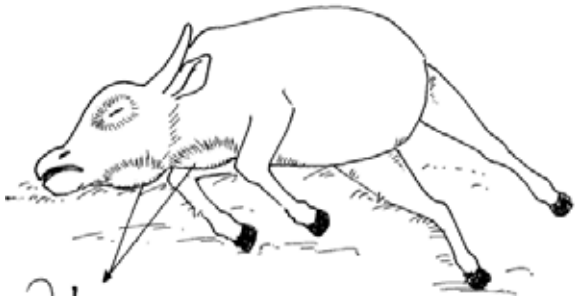
	Clinical signs: The udder is hot, painful and swollen. The milk is not clean, the colour is different and there may be lumps in the milk Treatment: Bathe the affected quarter with cold water and then milk out the quarter (at least twice a day) Do not let the calf suckle on the quarter In cases of severe mastitis inject an antibiotic (Penicilline-Streptomycine=) Image FAO (3)
Mastitis in sows	
	The udder becomes hot and hard. Treatment see under cow mastitis Clipping of eye-teeth of piglets may be necessary
Parturition/calving	
	Normal calving: Head and both legs emerge at the same time Difficulties in calving (1) Only the head of the calf has appeared. (2) The head and one foot has come out. (3) Two front feet showing but no head. (4) In some cases, the hind quarter emerges first All images: Ali 1994

6. Important livestock diseases

Vaccination would be the best solution to prevent a number of diseases listed hereafter. However, not all vaccines can be found on site and carrying out campaigns is often complicated by the fact that cold chains cannot be maintained.

6.1 Cattle

Haemorrhagic septicaemia (HS)



Tongue may be swollen and protrude from mouth, swollen throat (Lebrun 2006)

Clinical signs:

- High fever
- Diarrhoea
- Tongue may be swollen and protrude from the mouth, swollen throat
- Yellow, nasal discharge
- Milk suddenly reduced
- Heavy, noisy breathing
- Signs start suddenly and death occurs quickly
- Appears in animals in good condition and usually between 1–3 years old
- Mainly during wet season and following shipping or moving stress

Treatment: Antibiotics (Oxytetracycline 20% or Penicillin- Streptomycin) are effective only if administered early

Prevention: Vaccinate all cattle once a year, especially those between 1–3 years

Contagious bovine pleuropneumonia (CBPP)

<table>
<tr><td colspan="2">Animals are depressed, have a runny nose and separate themselves from the herd (Brown 2013)</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Head held out (Lebrun 2006)</td><td>The extended neck and head are due to respiratory distress and coughing (Brown 2013)</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td colspan="2">In slaughtered animals you find lungs covered with yellow material or having abundant yellow material (Brown 2013)</td></tr>
<tr><td>  </td><td>  </td></tr>
</table>

Clinical signs:

Slow development, throughout the year Loss of weight Loss of milk production Coughing Difficult breathing with nostrils moving and whole body may move, breath smells bad. Nasal discharge Jugular veins engorged	Chest dull when tapped Grunting Head held out Elbows held outwards Rigid back when squeezed Not moving well: walks hunched up Avoids standing in smoke close to a fire

Treatment: An antibiotic like Tylosin has to be injected intramuscularly every twelve hours for three days. Recovered animals remain carrier of the disease

Prevention: Vaccinate all cattle every year

Anthrax

Animal refuses to eat and there is development of bloat. distressed breathing. Often sudden death within 48 hours of illness of animal. The legs of dead animals are not stiff. Following death there is an oozing of blood from the natural orifices (nose, rectum, teats) which highly contagious for humans.

Blood oozing from nostrils	
	
Blood oozing from rectum (Lebrun 2006)	Blood dribbling from nose
	

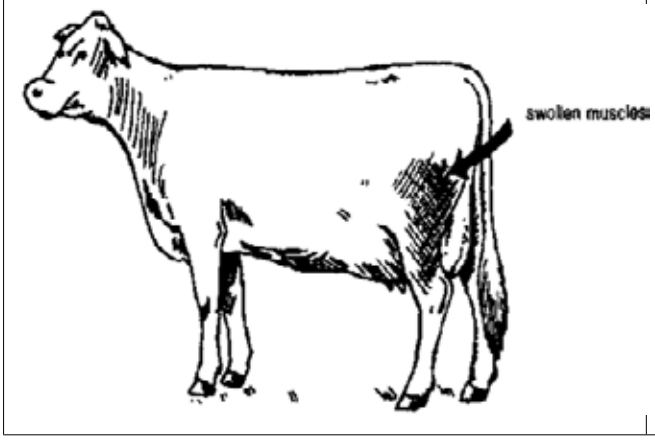
Typical enlarge spleen	Anthrax symptoms in men
	
Destruction of carcass by burning (Lebrun 2006)	
	

Treatment: Antibiotics (oxytetracycline 20% and Penicillin) may be effective if treatment is started early. Supportive therapy may also be necessary

Prevention: Vaccinate cattle up to 3 years old every year

Recommendations: in locations with anthrax meat inspection should always start with an inspection of the spleen to reduce the risk of self-contamination and spreading the disease in the slaughter-slab

Blackquarter/blackleg disease

	Gas beneath the skin (Lebrun 2006)
	

Sudden death / stiff legs (Lebrun 2006)	
	
Vaccination (Lebrun 2006)	
	Clinical signs: • Fever • Dullness • Sudden lameness of one leg • Swollen shoulder or hip • Feel gas beneath the skin when touched • Sudden death/stiff legs

Treatment: Penicillin
Prevention: Vaccinate cattle as from 3 years old every year

East Coast fever (ECF) theileriosis

Clinical signs:

- Presence of ticks
- High fever
- Lacrimation and nasal discharge may occur

Treatment: Parvaquone/buparvaquone

Prevention: Rigid tick control (spraying, pour-on) but economically not feasible

Difficult breathing is seen in this cow with an open mouth (Brown 2013)	Animals may have enlarged lymph nodes (Brown 2013)
	

Babesiosis

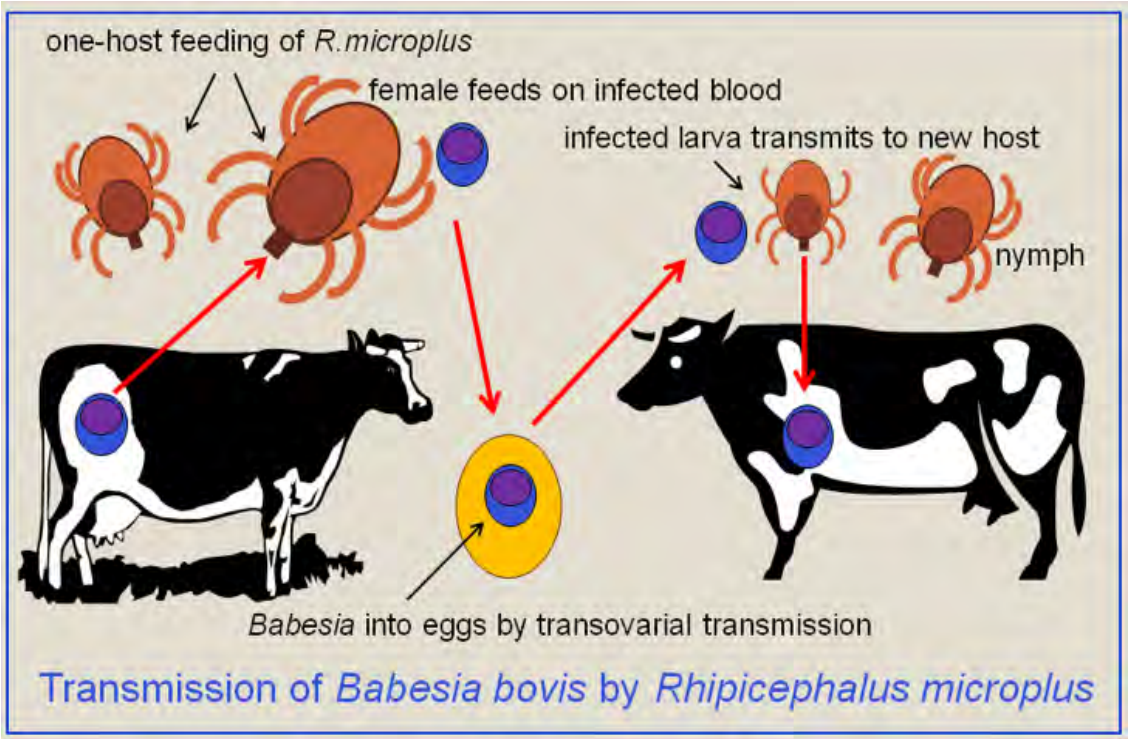
A tick-borne disease

Clinical signs
Fever (up to 410C)
No appetite
Dark coloured urine (caused by blood in urine)
Jaundice
Late-term pregnant cows may abort

Treatment: Diminazene aceturate (Berenil), supportive treatment with Oxytetracycline 20%

Prevention: Tick control

Transmission of Babesiosis from Wikipedia



Bloody urine

Heartwater

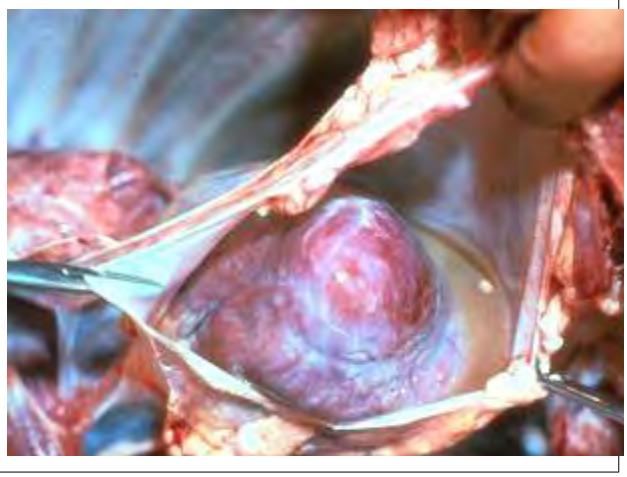
Another tick-borne disease

Clinical signs:

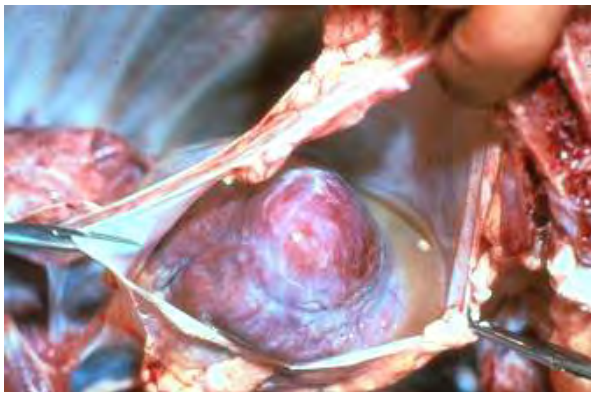
- In per-acute cases, animals may drop dead within a few hours of developing a fever
- Anorexia and depression
- Congested and friable mucous membranes
- Respiratory distress slowly develops along with nervous signs
- Stiffening of the limbs;
- Convulsions

Treatment: Oxytetracycline 20% in high doses is efficient if the treatment is done before nervous symptoms appear

Prevention: Tick control, supervision of animals during the risk period, keeping animals in a stable during the risk period

Amblyoma ticks on the skin (Brown 2013)	When slaughtered excess fluid around the heart
	

Anaplasmose

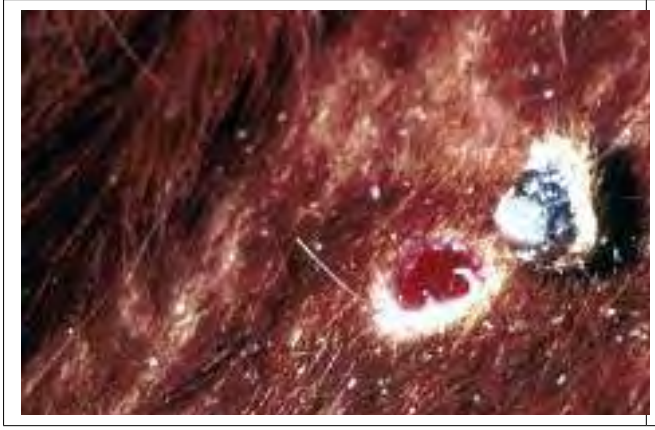
Wild and domestic ruminant disease caused by ticks. In areas where anaplasmosis is endemic, native cattle are generally resistant. On the other hand, cattle from anaplasmosis free regions are more sensitive and may develop clinical disease and die without treatment.

Clinical signs: mucous membranes become yellowish, anaemia, apathy, loss of appetite, abortion, drop in milk production.

Treatment: Imidocarb (IMAZOL, Norodine), 20% oxytetracyline)

Prevention: Tick control, All pictures (Brown 2013)	
	






Clinical signs:

- Skin nodules containing a firm, creamy-grey or yellow mass of tissue.
- Regional lymph nodes are swollen, and
- Oedema in the udder, brisket, and legs

Treatment: Administration of antibiotics (Oxytetracycline) to control secondary infection

Prevention: Vaccination (if available and economically justifiable)

Trypanosomiasis

Pictures (Brown 2013)


Enlarged lymph-node (Lebrun 2006)	Tail hair loss (Lebrun 2006)
	
Pale membranes (Lebrun 2006)	**Clinical signs**
	 Presence of tsetse flies •Fever and depression • Emaciation • Enlarged lymph nodes are clearly visible under the skin • Pale membranes • Tears • Milk reduced • Tail hair loss • Mainly during dry season

Treatment: Treatment of any suspected animal with diminazene aceturate e.g. Berenil or Novidium.

Prevention: Avoid known tsetse areas. Use pour-on with synthetic pyrethroids (ECTOPOR) to avoid bites from flies. Preventive treatment with Novidium

Brucellosis

Abortion and retention of placenta are clinical signs of brucellosis	Orchitis (swollen testicles) in (Lebrun 2006)
	

Clinical signs:

- Abortion in late pregnancy or stillbirths
- Enlarged testicles
- Swellings around joints and lameness

Treatment: Economically not justifiable, several injections of oxytetracycline or streptomycin

Prevention: Slaughter cows that abort repeatedly. In case of abortions, herd diagnosis with Milk Ring Test from bulk milk samples (milk form several cows mixed together).

Tuberculosis

Tuberculosis exists worldwide. It is a bacterial disease of domestic and wild animals, mainly cattle that can be transmitted to humans. During the CLIP survey in South Kivu (see "foreword", tuberculosis appears to play a role in pigs in South Kivu.

Loss of weight	Tuberculosis in the kidney of a pig
	
Tuberculosis in the udder of a cow	Avian tuberculosis
	

Clinical signs:

Cattle: Cough, with the progression of the disease: lymph nodes of the head, neck and front train grow larger, yellowish runny nose, loss of weight

Pigs: Generalization of tuberculosis in pigs leads to symptoms similar to those observed in cattle (see pictures). Tuberculosis is mainly diagnosed in slaughtered animals.

Fowls: There is an avian tuberculosis in domestic and wild birds. Avian tuberculosis can be transmitted to domestic livestock (cattle, pigs) but generally no clinical signs are observed. Avian tuberculosis can be dangerous for immunocompromised HIV) humans .

Prevention: Health risks for the human population are real because humans are susceptible to pathogens. The danger is particularly present in raw milk. It is therefore necessary to screen dairy cows to eliminate affected females but also to boil raw milk before consumption (the commercially available pasteurized or UHT milk has been subjected to a treatment that kills the pathogen of tuberculosis).

Treatment: the treatment is contraindicated, eradication of identified carrier animals

6.2 Goats and sheep

Peste des petits ruminants (PPR)

PPR can result in discharge around mouth and nose (Brown 2013)

Foul-smelling diarrhoea (Brown 2013)

Crusting around the mouth and nose, and also open-mouthed breathing (Brown 2013)

Crusting around eyes (Brown 2013)

Crusting around nose (Brown 2013)

Ulcers in the mouth (Brown 2013)	Sores in the mouth: lips, gums, cheeks (Lebrun 2006)
	

Clinical signs:

Sudden death, especially in goats. Discharges from eyes, nose and mouth, first thin then purulent. Difficult breathing and coughing.	Sores in mouth, the animal does not eat anymore. Dry, cracked muzzle and nostrils. Severe diarrhoea with sometimes blood Death in 5–10 days

Treatment: No treatment

Prevention: Vaccinate every year

Goat/sheep pox

Clinical signs: The disease in either species must be differentiated from the milder infection, contagious ecthyma (ORF virus) which mainly causes crusty, proliferative lesions around the mouth.

All pictures from Brown 2013	
	

Treatment: Treatment (antibiotics like Oxytetracycline) is directed at preventing or controlling secondary infection

Prevention: Lumpy skin disease vaccine is sometimes against sheep and goat pox.

Contagious ecthhyma (ORF)

Clinical signs:

Contagious ecthyma is an infectious dermatitis of sheep and goats that affects primarily the lips of young animals. The disease is usually more severe in goats than in sheep. People are occasionally affected through direct contact.

Treatment: Both parenteral and topical antibiotics may help combat secondary bacterial infection of the skin lesions

Prevention: Vaccination is possible, but the vaccine will not prevent contagious ecthyma, but will greatly decrease the severity and duration of the disease

Contagious caprine pleuropneumonia (CCPP)

This disease affects only goats

Goat infected with CCPP showing respiratory distress (Brown 2013)	Goat with nasal discharge due to CCPP (Brown 2013)

Clinical signs:

Depression,	Decreased production
Dullness, lethargy	Respiratory signs including bilateral nasal discharge
Weakness and,	Coughing
Fever	Occasionally the only sign seen is sudden death.
Weight loss	

Treatment: Oxytetracycline 20%, Tylosin

Prevention: Vaccination

Goat infected with CCPP showing respiratory distress (Brown 2013)	Goat with nasal discharge due to CCPP (Brown 2013)
	

6.3 Dogs

Rabies

Rabies (Image: Ali 1994)	
	

This is a disease of the brain, which can affect all animals as well as humans. It is caused by germs, which are transferred through the bites of rabid (sick animals even if not showing clinical signs yet e.g. they are afraid of water) carnivorous animals such as dogs, foxes, wolves, hyenas, and some bloodsucking bats. When the rabid animal bites another animal or human, the germs, which live in its saliva, pass into the body through the wound caused by the bite. The germs travel along the nerves to the brain

6.4 Poultry

Avian influenza

Clinical signs: listlessness, loss of appetite, respiratory distress, blue combs, diarrhea, nervous disorder, drop in egg production. , in high pathogenic cases: massive morbidity (many animals show same symptoms simultaneously) and high mortality(cases of death) up to 100%. Not always easy to distinguish from Newcastle Disease

Treatment: There is no effective treatment for avian influenza. Rapid destruction of all infected flocks remains the only effective method of stopping an avian influenza outbreak if the disease is confirmed through a laboratory.

Prevention: Avoiding contact with wild birds, keeping animals in poultry house and not on free-range or scavenging. Chicken houses should not be accessed by people not belonging to the household.

Newcastle disease

Chicken may be paralyzed but still alert

Very depressed hen and with signs of diarrhoea and a crooked neck

Swelling and redness of the eyelids, open mouth breathing (Brown 2013)

Bleeding in the eyelid and also comb is blue (Brown 2013)

Clinical signs: (see also pictures above)

Digestive signs: greenish diarrhea Respiratory signs: ocular and nasal discharges, sneezing, difficult breath Nervous signs: quivering, loss of balance, paralysis, collapse on legs	Skin signs: swollen crest and wattles, red spots on the skin Drop in egg laying High mortality

Treatment: No treatment

Prevention: Vaccine twice a year all animals (eye drops or drinking water)

Good quarantine practice and avoiding to the introduction of new chicken directly into the existing flock

Clinical signs: In acute outbreaks, dead birds may be the first sign. Fever, reduced feed consumption, slimy, sticky discharge from the mouth, ruffled feathers, diarrhea, and labored breathing maybe seen. As fowl cholera becomes chronic, chickens develop abscessed wattles and swollen joints and foot pads. Can be mistaken for Avian Influenza and Newcastle disease

Treatment: Flock treatment with sulfonamides

Prevention: Rodent rat) control is essential to prevent future outbreaks.

Fowl/avian cholera or avian paseurellosis

Clinical signs: In acute outbreaks, dead birds may be the first sign. Fever, reduced feed consumption, slimy, sticky discharge from the mouth, ruffled feathers, diarrhea, and labored breathing maybe seen. As fowl cholera becomes chronic, chickens develop abscessed wattles and swollen joints and foot pads. Can be mistaken for Avian Influenza and Newcastle disease

Treatment: Flock treatment with sulfonamides

Prevention: Rodent rat) control is essential to prevent future outbreaks.

Coccidiosis

Parasitic disease which can cause death particularly in chicks.

Frequent symptoms: thin blood-streaked feces. Transmission: by contaminated food, water or litter

Treatment: Coccidiostats like "Amprolium", Monensin, but also Sulfadimidine

Cleaning of the chicken pen and its surroundings with a disinfectant

Salmoneloses

Disease caused by bacteria of the Salmonella family, low risk for humans

Disease	Pathogen	Transmission	Symptoms	Prevention/Treatment
Pullorum disease	Salmonella affects mainly young chicken	Through the eggs of infected birds	White diarrhea. Les young birds have difficulties to walk, swollen abdomens, and their wings sag, Animals seem depressed without energy High mortality	No treatment Elimination (slaughtering of) infected birds
Fowl typhoid	Salmonella, in mature and growing chicken	Through droppings and equipment	High temperatures, birds seem tired, blue combs, sudden death, and mortality high (above 60%)	No treatment Culling of sick birds Hygiene measures (don not buy birds from unknown sources) Vaccination possible but not also available

Pullorum disease	Fowl typhoid
	

6.5 Pigs[2]

African Swine fever

Culled pigs	
	

2 User guide on pig husbandry, MAAIF F, National Agricultural Advisory Services, .Uganda

Clinical signs: Fever, dullness, loss of appetite, huddling together, incoordination, coughing, discolouration of skin to bluish, fluid eye and nose discharges, vomiting and

Treatment: No treatment. Control (biosecurity) measures only such as penning of animals restricting the number of people entering the pig house, disinfection foot bath, protective cloths,

Prevention: No vaccine available yet, culling of sick animals

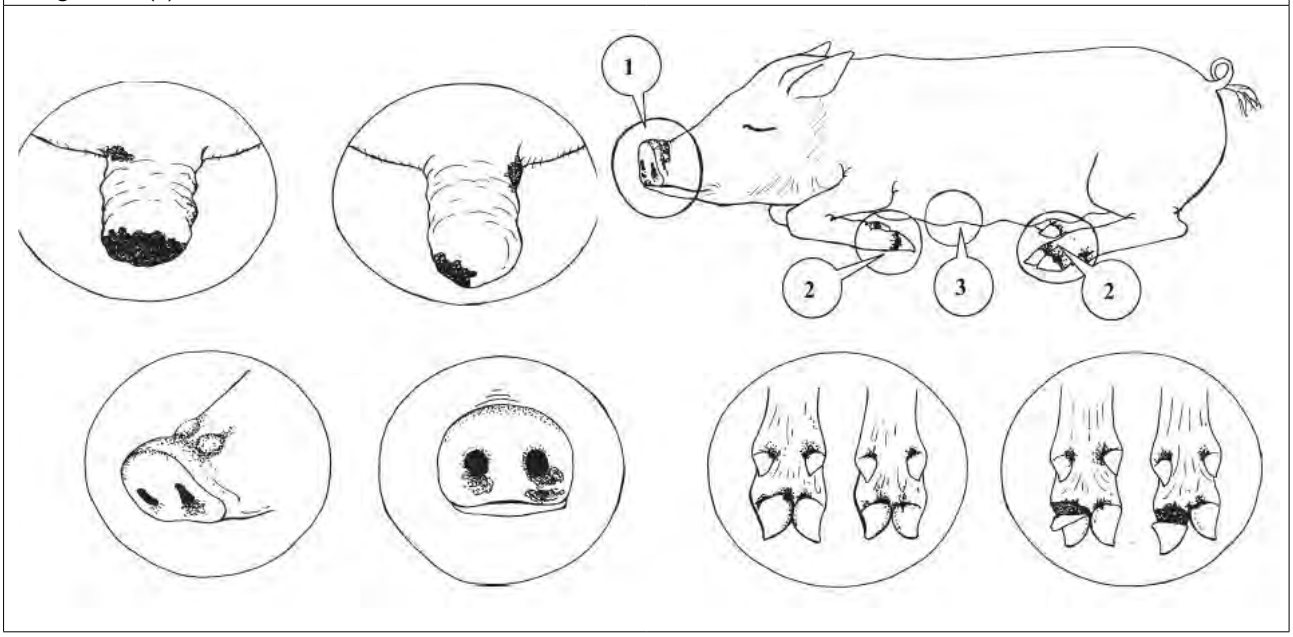
Foot-and-mouth disease

Clinical signs: Fever and vesicles at the level of the feet (between the hoofs, along the moth of the horn and on the heels) and the mouth (on the lips, gums, and tongue).

Treatment: Culling of animals in contaminated farms

Prevention: Vaccination possible

Image FAO (3)



Swine erysipela

Dog sitting position in pigs with arthritis form

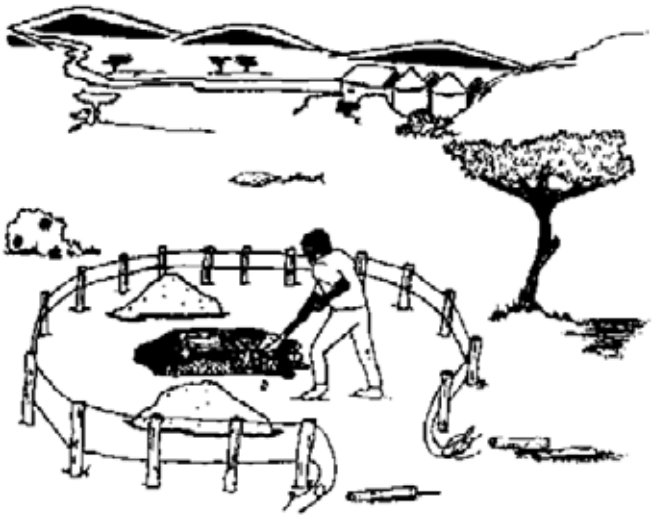
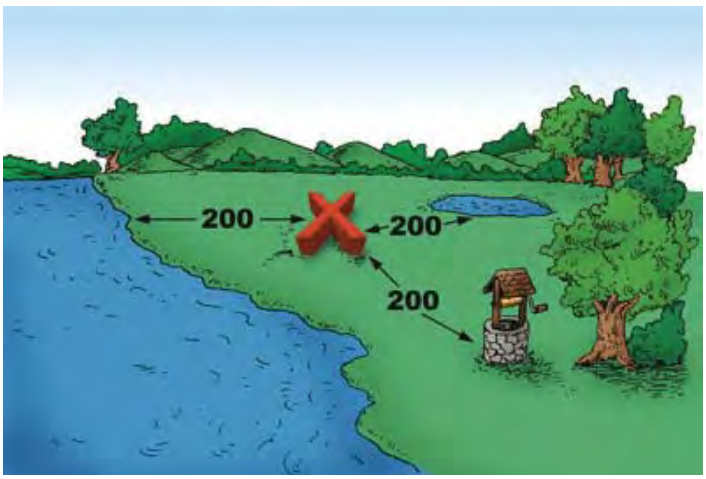
Clinical signs: Sudden death, loss of appetite, red and bluish appearance of the skin and ears. Diamond shaped skin lesions, which may become necrotic

Treatment: Penicillin is very effective and is the drug of choice prevention: Control (biosecurity) measures

7. Disposal of dead animals

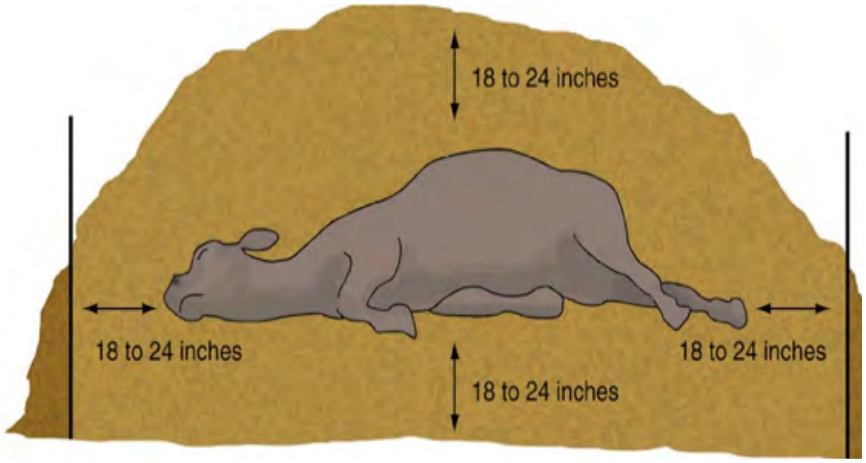
Proper disposal methods/systems are especially important due to the potential for disease transfer to humans and other animals, and the pollution of soil, air and ground water. The options for remote rural areas are shown hereafter.

7.1 Burial[3]

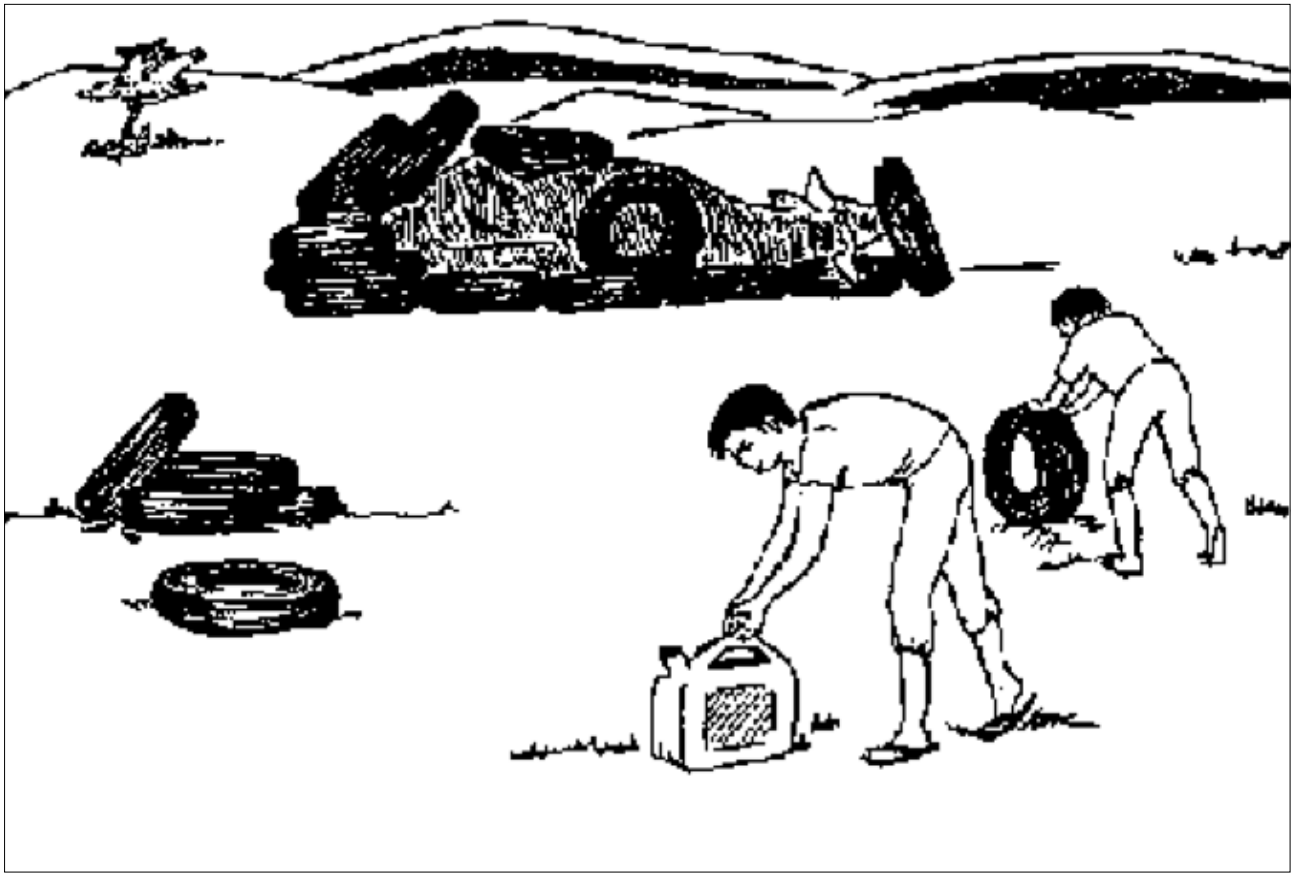
	Burial must be no less than 2 m deep with a minimum of 80 cm of soil cover. Burial must be in well drained soils
	Keep burial site away from water sources (at least 200 m) to avoid contamination.

3 Ali, T.A. 1994. A manual for the primary animal health care worker. Rome, Italy: FAO, chapter 10

7.2 Composting



Keep burial site away from water sources (at least 200 m) to avoid contamination.



7.3 Burning[4]

In order to properly burn dead animals, you must put fire under and over the carcass. The fire must be very hot and big enough to burn all of the body.

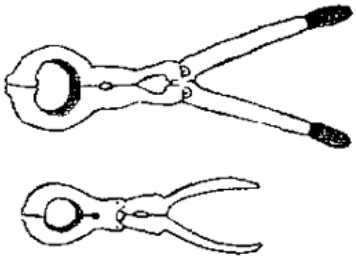
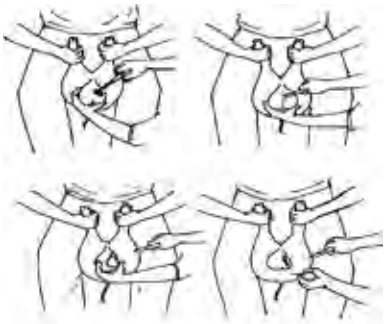
To do this first dig a channel in which to put the body. A channel 1 metre long, 30 cm wide and 40 cm deep will be needed for a cow or horse. Put straw and wood inside the channel and place the carcass on top. Cover the animal with straw and wood before spraying the pile with some kerosene or petrol and lighting

4 Ali, T.A. 1994. A manual for the primary animal health care worker. Rome, Italy: FAO, chapter 10

7.4 Destruction of dead or culled bird

Bury the dead animals at least 2 metres deep and cover with quicklime (Lebrun 2006)	Burn dead animals (Lebrun 2006)
	

8. Minor surgery and other interventions

Castration of a bull with Burdizzo	Burdizzo for cattle and shoats	Castration of a bull with Burdizzo
		
Castration of a buck with Burdizzo	**Castration of piglets**	
		
		

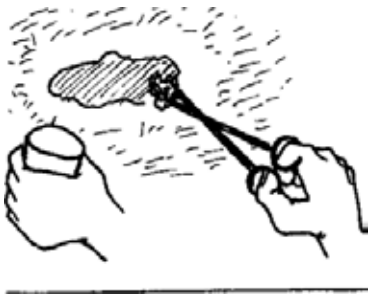
Ear tagging and ear notching (pigs)

Cutting of horns with wire saw

Wound treatment

Wash wound with soap and water

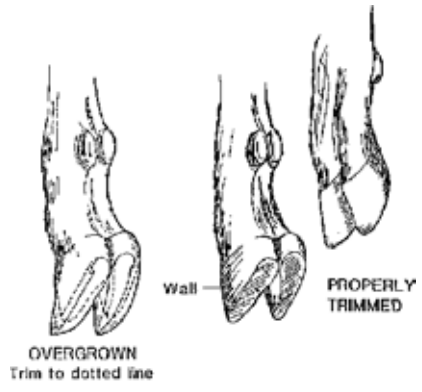
Disinfect wound

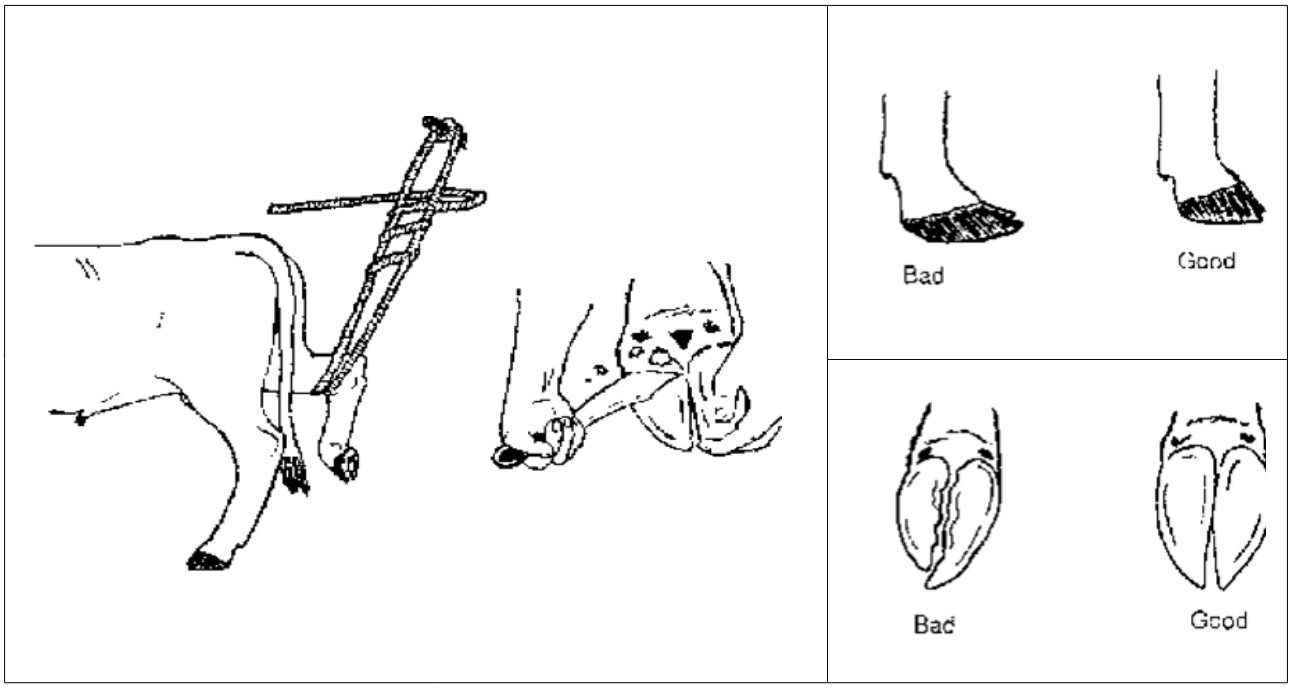


Apply wound spray

Treatment of broken horns

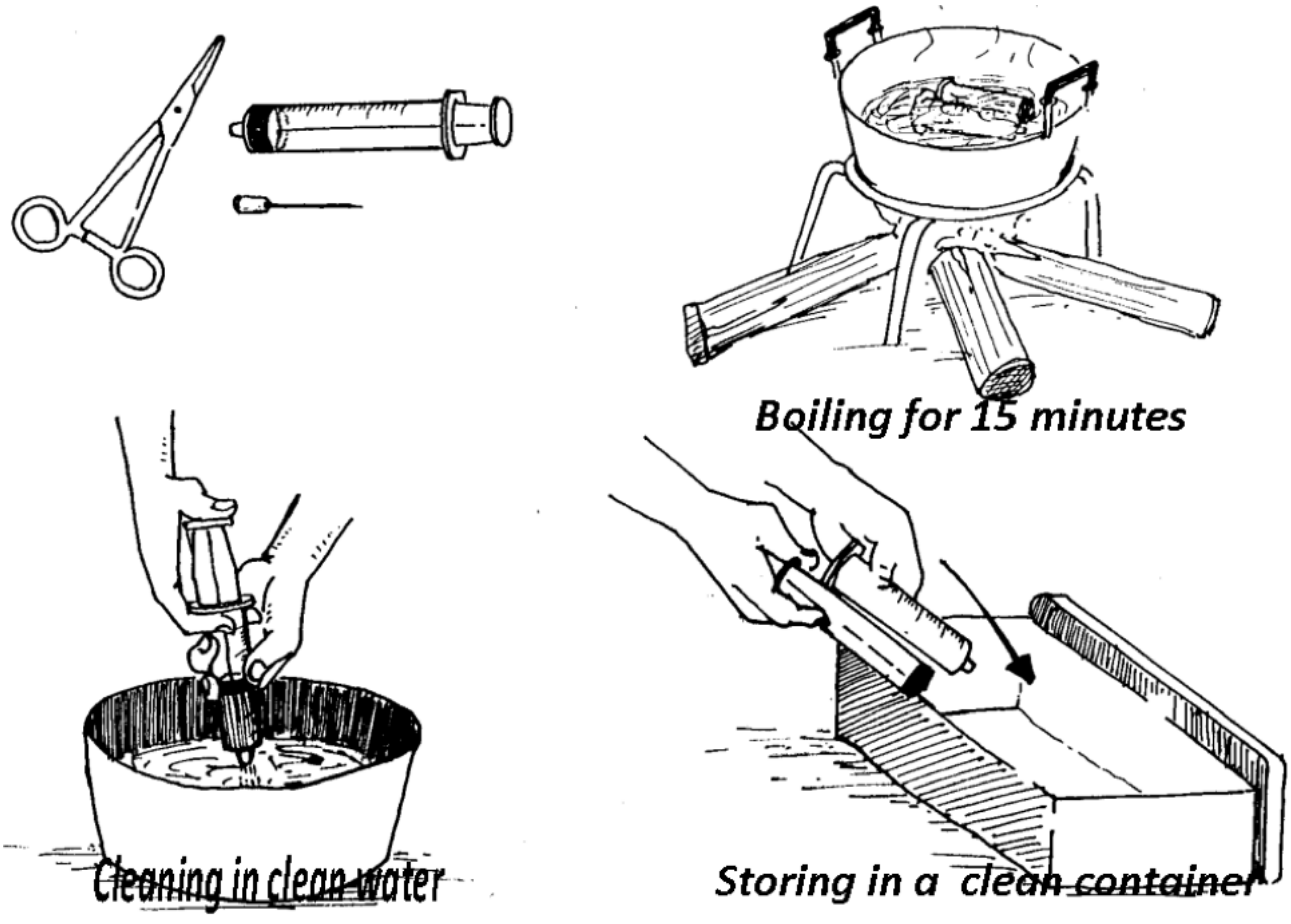
Hoof trimming using a sharp knife and a wood grater




Bad
Good
Bad
Good

9. Maintenance (cleaning, sterilization) of equipment

Syringes and needles must be cleaned and sterilized after treatment to kill germs. Afterwards they must be kept in a clean container. Instruments, which cannot be boiled, should be thoroughly scrubbed clean and then wiped with a disinfectant before being stored or used again. *Do not use disinfectants to clean syringes and needles used for vaccination this may kill the life vaccine*



10. Use of drugs

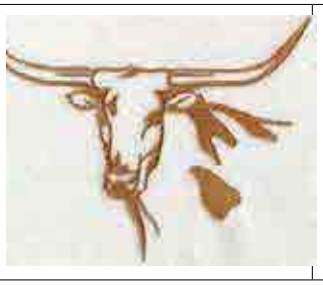
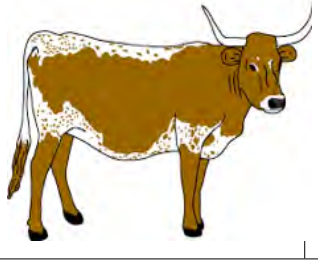
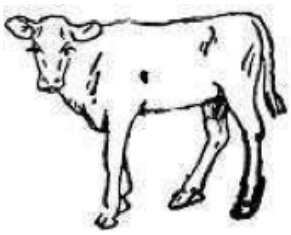
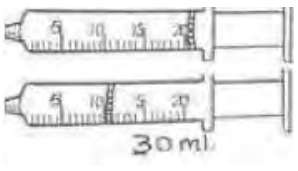
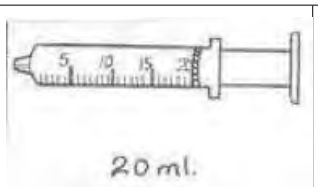
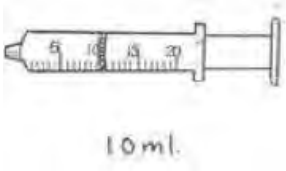
10.1 Necessary information on a medicine

Names of drugs in this document refer to the active ingredient e.g. Oxytetracycline is an antibiotic. . Annex 2 shows some brand names of active ingredients. Experience shows however, that not always the same brands can be found in the market. It is therefore better to use the active ingredient name when looking for a medicine and to check its concentration e.g. Oxytetracycline 200 (LA = long action or retard) contains 200 mg of active principle per ml. This information can be found on the label. The following information must be shown on a veterinary medicine label (the example is based on the label hereafter):

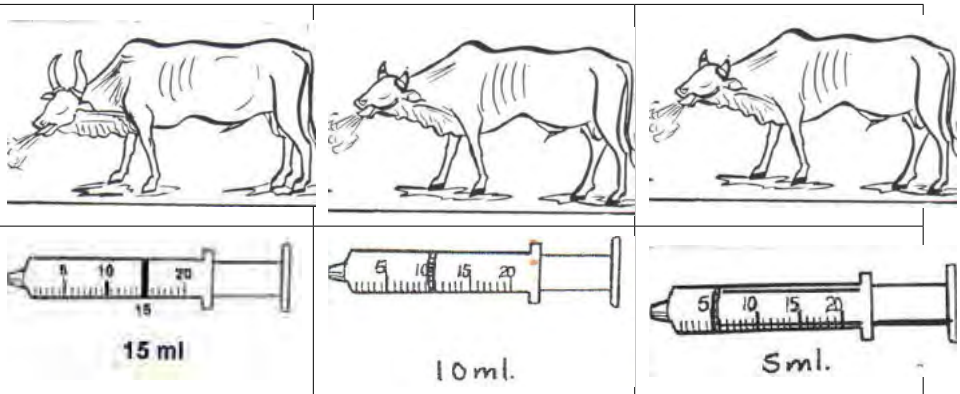
- The statement 'For animal treatment (use) only'
- Trade name: Vetrimec Plus
- Active ingredient(s) and quantities : Ivermectin-Clorsulon
- Use claim(s): Treatment and control of internal parasites
- Directions for use: For subcutaneous injection only
- Registration number: NOC 13985 038 o6
- Withholding statements, if applicable do not treat cattle within 49 days of slaughter
- Registrant/: Norbrook Laboratories Limited
- Batch (lot) number
- Expiry date
- Net contents: 1000 ml
- Storage instructions: Store at 15–30^{0}C, protect product from light
- Warning: Not for use in humans, keep out of the reach of children
- Adverse effects cautions and contraindications: Do not use in calves to be processed for veal.

10.2 Dosage of some common medicines

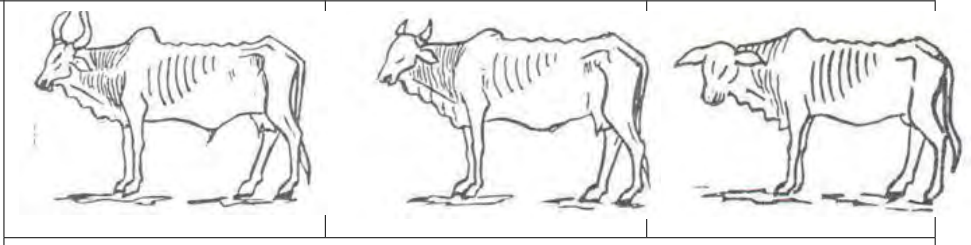
Bovines

Age			
Oxytetracycline 20% (1 ml -200 mg	Blackquarter, LSD, FMD		
			
	CBPP. HS		
			

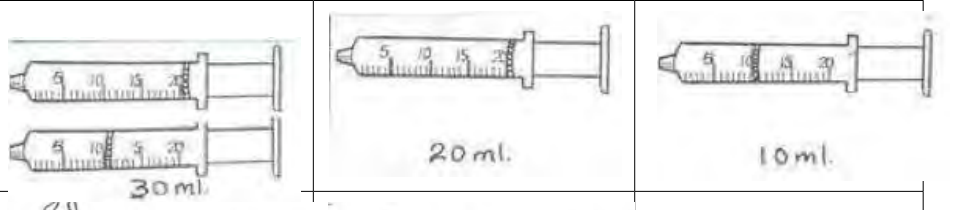
Tylosine 200mg per ml



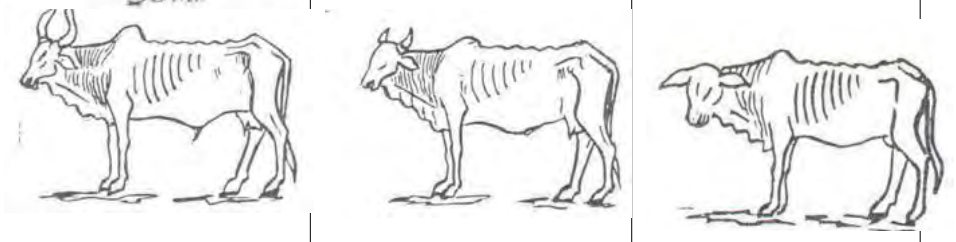
Albendazole



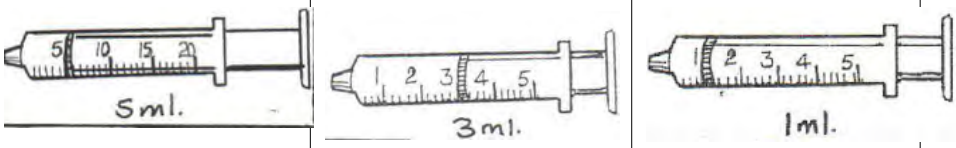
Against worms and liver-flukes



Ivermectine

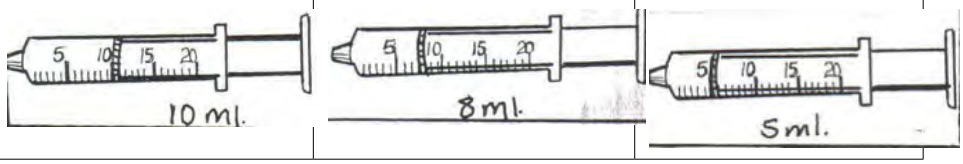


Internal and external parasites including mites,

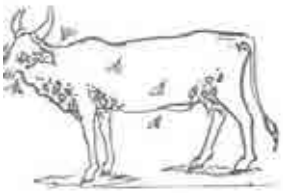


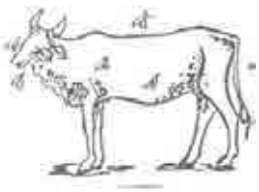
Novidium

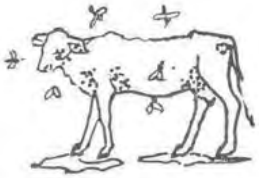
Trypanosomiasis



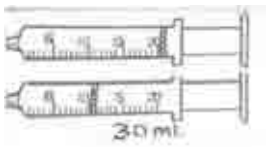
Opticlox

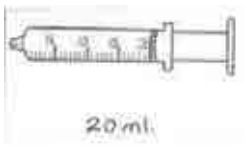


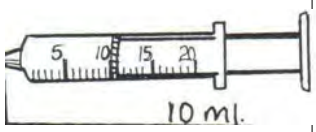




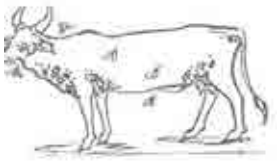
External parasites

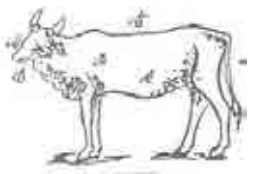


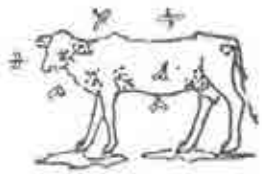




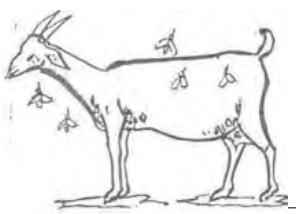
Norotraz

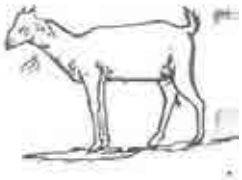




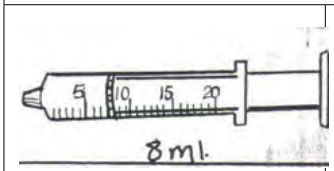


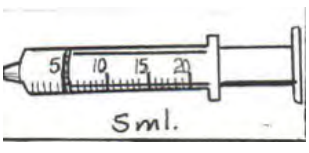
External parasites

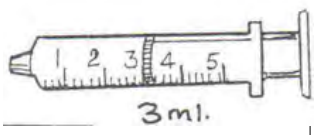


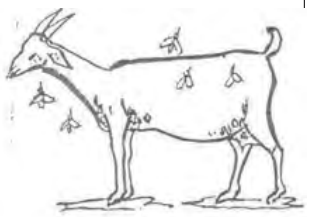


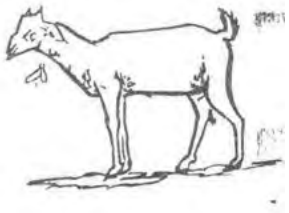
Ectoparasites

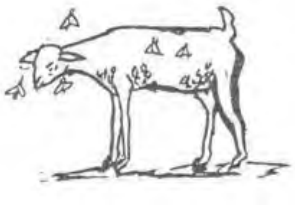




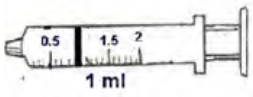


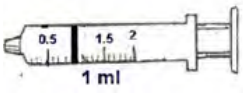


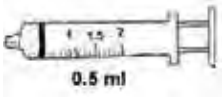




Worms and external parasites







Pigs

Product	Adult pigs	Piglets	Treatment of
Oxytetracycline 200 1 ml = 200 mg 	18 mg /kg i.m.	18 mg per kg = 0.1 ml per kg i.m. A piglet of 5 kg will get 0.5 ml of Oxytetracycline	Used in sows against infectious enteritis pasteurellosis pneumonia, rhinitis, joint infection
Penicillin/Streptomycin 20/20 LA 	15 -25 mg/kg 1ml of Pen =Strept 20/20 LA will treat 10 kg of swine	15 -25 mg/kg	Respiratory diseases Erysipleas Mastitis Pasteurellosis
Tylosin 200 mg/ml 	2 to 1o mg per kg 1ml will treat at least 20 kg of pigs	10 to 10 mg per kg	Erysipela Pasteurellosis
Amitraz	Spray to be used according to manufacturer's indication	No for piglets	External parasites
Ivemectin 1%	1 ml per 35 kg s.c.	1ml per 35 kg s.c	Roundworms, lungworms, lice, mites
Albendazole	5 to 10 mg /kg	5 – 10 mg/kg	Roundworms
Mebendazole	30 mg/kg in feed for + 5 days		Roundworms, tapeworms

Poultry

The possibilities for a CAHW to treat poultry are quite limited because of the number of birds in a household, the size of drugs for treatment of poultry which is only suitable for larger flocks (at least 50 birds) and the cost of the drugs. Certain interventions are only justifiable if the entire community joins e.g. the vaccination against Newcastle Disease.

The possible interventions (preventive and curative) can be grouped into four categories

1. Vaccination against Newcastle Disease. Problems which may arise and need to be handled are the following, (a) cold chain, the vaccine needs to be kept cold , unless a heat stable (not requiring a cold chain) vaccine can be acquired. Currently the KEVEVAPI (Kenya Veterinary Vaccine Production Institute) does not produce this type of vaccine any longer ((b) vials of vaccine available on the market are for at least 200 birds. The vaccine must be used immediately after opening the vial and cannot be stored again
2. Diarrhoea, caused by bacterial pathogens, but also by coccidiosis and intestinal worms. Most important are improvement of housing conditions to reduce the risk of (re)- infection e.g. daily cleaning of droppings. Amprolium or some Sulfonamide powders can be used for the treatment against coccidiosis (red diarrhoeas because of blood in the faeces) and bacterial diarrhoea (green or white). Powdered leaves of Moringa oleifera mixed in feed may prevent coccidiosis. Specific dewormers exist for intestinal parasites.
3. External parasites, control measures like regular cleaning are most important. Allow birds to use ash baths to which in severe cases insecticidal dusting powder or powdered mothballs (naphthalene) can be added
4. Respiratory diseases causes by viruses and bacteria. Treatment with tylosin in drinking water is possible.

Treatment of coccidiosis	Dust bath	Insecticide powder for poultry
		

Dogs and cats

Amitraz is toxic for cats

Ivermectine can be injected to treat worms and mites

Albendazole can be used against worms for dogs and cats

Mebendazole can be used against worms in cats and dogs

Penicillin/Streptomycine 20/20 can be used in infections in cats and dogs (1ml/10kg i.m.), injection can be repeated for 4 to 5 days

11. Reporting forms for CAHW

The veterinary authority may request that you present monthly reports on your activities.

If no format is prescribed the CAHW should nevertheless keep records on his work to be able to see for example how he has used his initial medicine supply. The last column is rather for personal information to be able to assess the viability of the work.

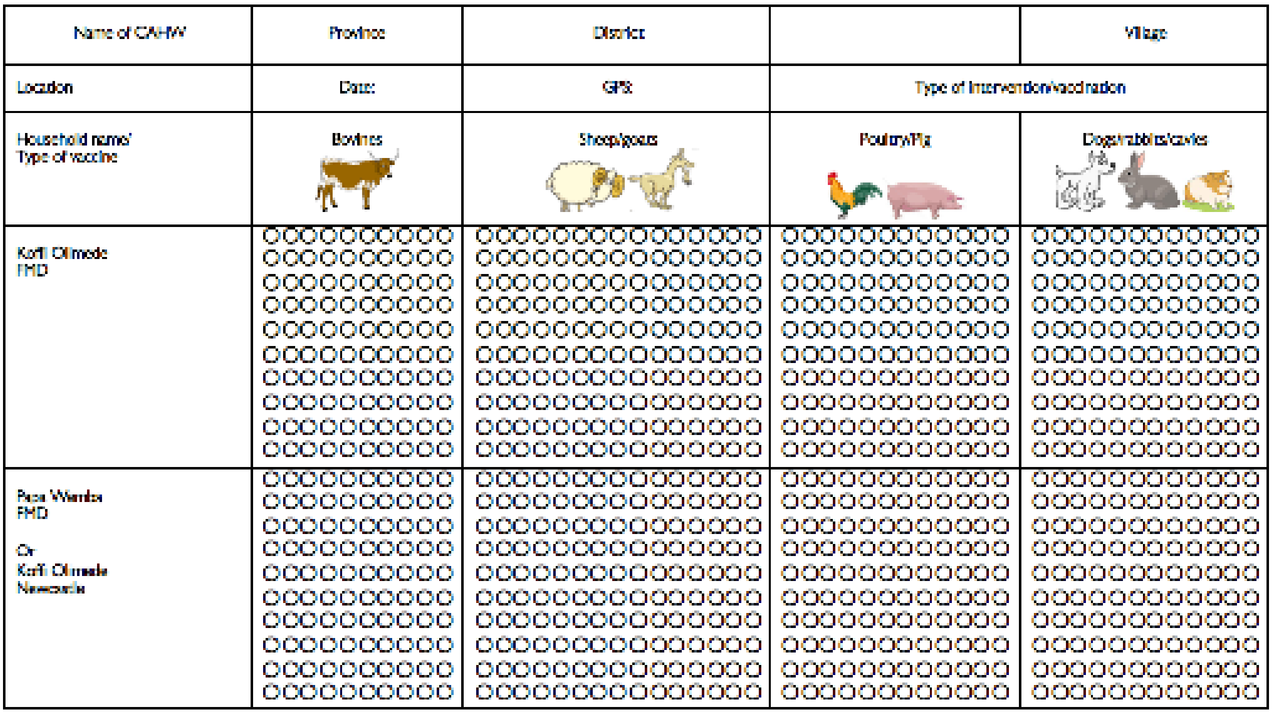
11.1 Treatment record

Date	Name and location of livestock owner	Age and type of animal	Problem	Details of Action taken e.g. quantity and type of drug used	Amount paid by farmer

11.2 Vaccination record

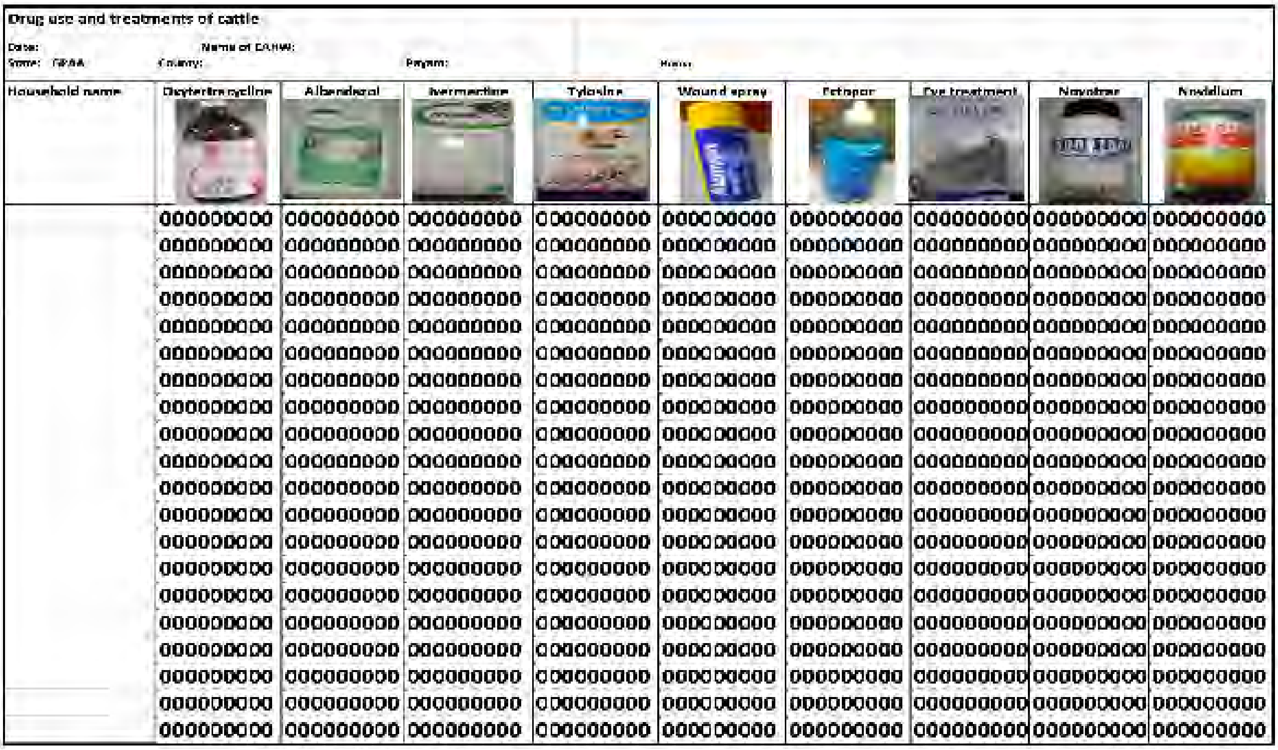
Date	Vaccination type (FMD, HS, etc)	Species vaccinated (cattle, sheep, goat, etc.	Number of animals	Name of owner and location

11.3 Treatment/vaccination form



Name of CAHW	Province	District		Village
Location	Date:	GPS	Type of intervention/vaccination	
Household name/ Type of vaccine	Bovines	Sheep/goats	Poultry/Pig	Dogs/rabbits/cavies
Kofi Olimede FMD				
Papa Wamba FMD Or Kofi Olimede Newcastle				

11.4 Treatment form by drug used



Drug use and treatments of cattle

Date: Name of CAHW:

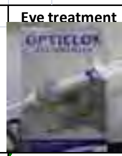
State: GPAA County: Payam: Boma:

Household name	Oxytetracycline	Albendazol	Ivermectine	Tylosine	Wound spray	Ectopor	Eye treatment	Novotrex	Novidium

Treatment of goats and sheep

Date: Name of CAHW:

State: GPAA County: Payam: Boma:

Household name	Oxytertracycline	Albendazol	Ivermectine	Tylosine	Wound spray	Ectopor	Eye treatment	Novotraz	Novidium
									
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Record on use of drugs in pigs

Date: Name of CAHW

Province District Village

Nom de l'eleveur	Oxytertracycline	Albendazol	Ivermectine	Tylosine	Wound spray	Ectopor	Eye treatment	Norotraz	Pen-Strept
									
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Annex 1: Proposed basic kit for CAHW

This kit is based on the requirements to take care of the diseases found in the sub region (see Foreword: CLIP disease survey)

Drug	Ruminants	Pigs	Dogs/rabbits /cavies
Oxytetracycline 20% injectable , 100 ml bottle	yes	yes	Not for cavies
Oxytetracycline 5%, 100 ml	yes	yes	Not for cavies
Penicillin- Streptomycin (10.000 U/ml) 100 ml bottle	yes	yes	Not for cavies
Tylosin 20%, 100 ml bottle	yes	yes	Yes
Ivermectine1%, injectable, 50 ml bottle	yes	yes	yes
Imocarb 120	yes		dog
Novidium tablets 250 mg	yes	no	no
Diminazene aceturate, 2.36 g sachet	yes	no	For dogs 0.1 ml/2 kg , do not repeat injection
Pour on of pyrethroide basis like cypermethrin, deltamethrin, flumethrin, 500 ml can	yes	yes	yes
Oxytetracycline wound spray, 250 ml can	yes	yes	For dogs
Healing Oil on quaternary basis, 100ml can	yes	yes	yes
Antibacterial wound dressing powder (preferably mixed with antiparasitic agent)	yes	yes	yes
Antibiotic eye ointment	yes	yes	yes
Multipurpose disinfectant, 500 ml bottle	yes	yes	yes
Poultry drugs			
Poultry louse powder or Dudu Poultry Dust	yes		yes
Sulfamethazine 25%, 500 ml or	yes		Rabbits and cavies
Amprolium against coccidiosis	yes		Only rabbits

Consumables

Designation	Quantity
Disposable syringes 20ml	
Disposable syringe 10 ml	
Disposable syringe 5 ml	
Disposable syringe2 ml	
Re-usable hard plastic syringes 30 ml	
Disposable Needles G18 x 1 ½	
Disposable Needles G 14 x 1 ½	
Cotton wool	
Disposable latex gloves	
Reporting forms, sets	

Equipment

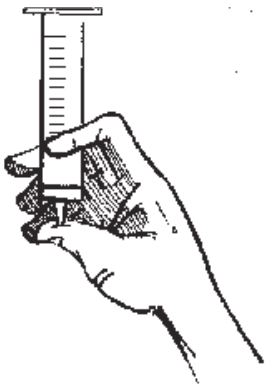
Designation	Par CAHW and year	Remarks
Knapsack sprayer	1	
Overall	1	
Gumboots	1	
Rain coat	1	
Burdizzo plyer	1 per district	for the supervising veterinarian
Dehorning wire saw	1	
Automatic syringe for vaccination with spare parts (glass cylinders, washers)	1	
Pot with lid to sterilize syringes and needles	1	
Thermometer	1	
Ropes	1	

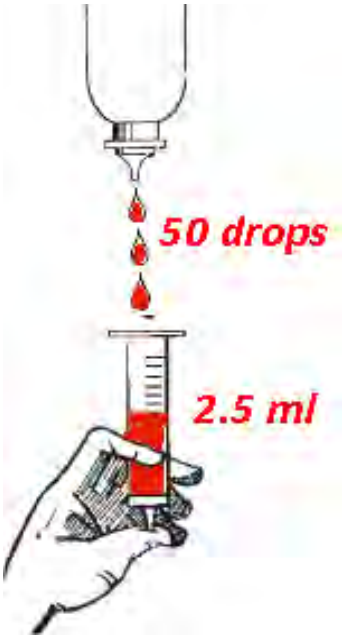
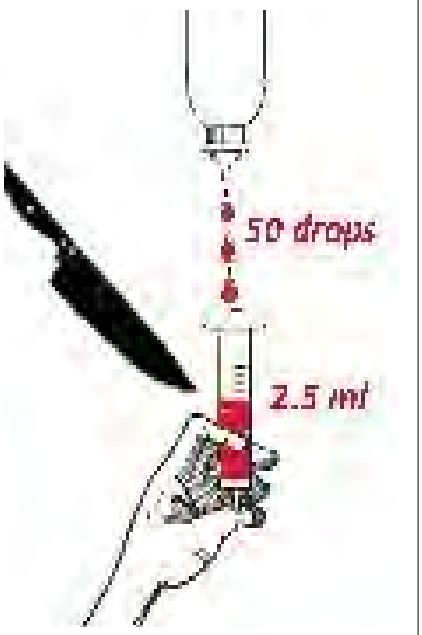
Annex 2: Brand names of available drugs in the region

Product	Brand name (to be completed/updated by the trainer and/or the veterinary supervisors
Oxytetracycline long action (20%)	
Oxytetracycline 5%	
Penicillin Streptomycin	
Tylosin	
Antibiotic eye ointment for large animals	
Multipurpose disinfectant e.g. quaternaries or chloroxylenol	Dettol
Wound powder	Negasunt
Healing oil	
Insecticide powder for chicken	Sevin poultry powder/dust

Annex 3: How to calibrate a dropper for newcastle vaccination

1. Check the vaccine label to determine the number of doses per vial. Check the expiry date	
	

2. Remove the tip of the eye-drop	3. Fill the eye-dropper with water	4. Replace the tip
	3. Tits Image: Ali 1994	
Remove the plunger from a 10 mL or 20 mL syringe	Hold the syringe vertically with the tip down. The tip should be closed with a finger or a thumb	Hold the eye-dropper vertically, squeeze the eye-dropper very gently and count the drops as they fall into the syringe
		

<table>
<tr><td>Continue counting until the number of drops equals the number of doses contained in the vaccine vial</td><td>Hold the syringe vertically and check the level of the water against the marks on the syringe. This is the volume required to dilute the vaccine.</td><td>Mark the level by scratching with a knife the syringe at the identified volume to mark this level permanently</td></tr>
<tr><td colspan="3">Preparation of vaccine for eye administration</td></tr>
<tr><td colspan="2">Fill diluent (distilled water) in required quantity to the vaccine vial, shake well, decant to dropper, replace tip</td><td>Start vaccinating (one drop per chicken)</td></tr>
<tr><td colspan="2"> 
</td><td> 
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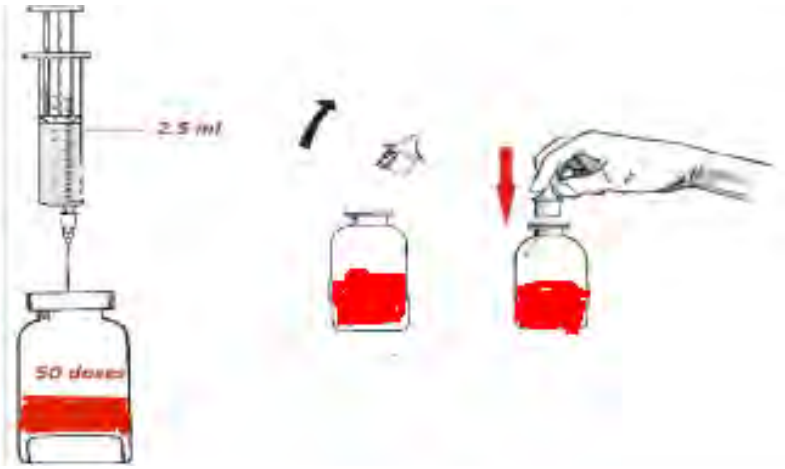
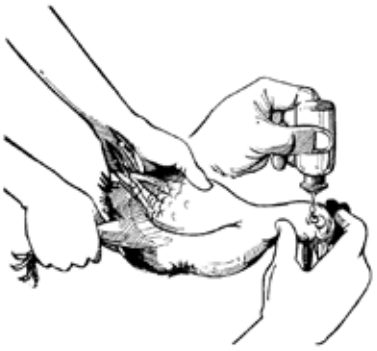
<tr><td colspan="2"> 
</td><td>  </td></tr>
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