Training Notes

For

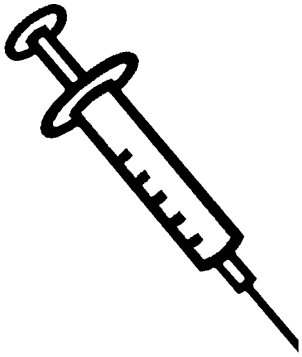
Community Animal Health Workers

Medicines for animals

Small Scale Livestock and Livelihoods Program
PO Box 1604, Lilongwe Malawi

Medicines for animals

Session 1: General characteristics of medicines



Session Objectives:

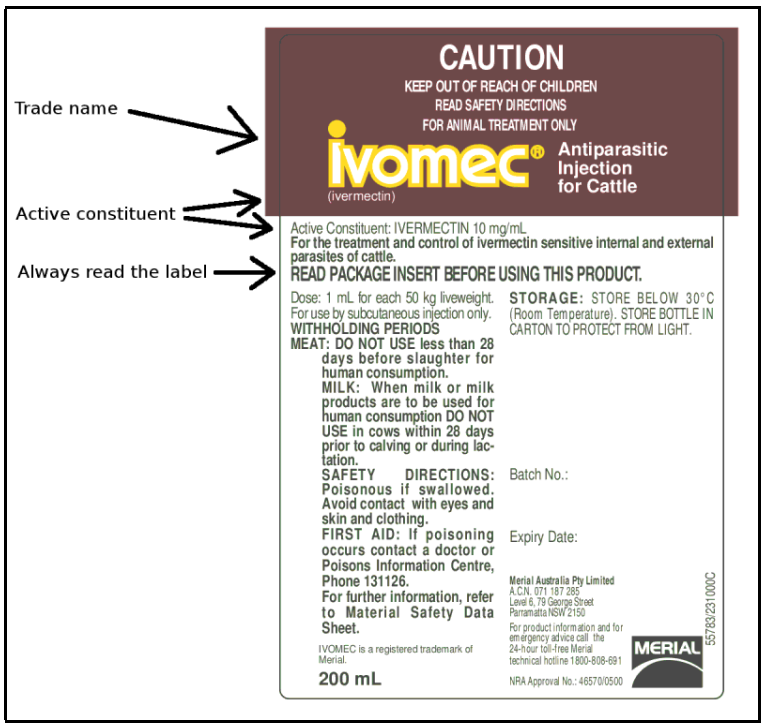
At the end of this training session, each participant should be able to:

1. **Read and understand a product label**
2. **Understand the different types of medicines and different means of application**
3. **Understand what types of medicines are used for what diseases or conditions**
4. **Calculate a dose rate and a dilution rate for common animal medicines**

Labels for medicines

Exercise:
Read the product label shown below. This is just an example for our review. Discuss the following:

- What is the product trade name?
- What is the name of the active constituent?
- What is the product used for?
- In what species is this product used?
- How much would you give to a cow weighing 300 kg?
- How much would you give to a calf weighing 70 kg?
- Where and how would you store this product?



An example product label

Rule Number 1: Always read the label

- The golden rule is **ALWAYS READ THE LABEL**. Read and understand the label **before** using the product. Do not use the product in a different way even if you have seen others do so. Always follow the label instructions. If you do not understand the correct use of the product, ask an expert first.
- Most animal medicines are referred to by their **trade name**. The trade name is the name given by the company which sells the product.
- However the important information about an animal medicine is the name of the '**active constituent**'. This is usually written somewhere on the product label. It may be called the '**active ingredient**'. The identity of the active constituent will often tell us what is the main use of the product.
- The label will also give information on how to use the product, the '**Directions for use**'. It will also give information about precautions to take. In the example shown above, there are precautions we should take not to use the product if the animal is to be slaughtered for consumption within 28 days.
- Always keep the product label with the product. Keep the product with the box it came in, with the package insert if there is one, and with the original label. Never throw away the package insert or the label before the product is completely finished. You may need to check the information on the package insert or the label.
- If you have to repackage the product from the original container, get a copy of the label and keep it with the repackaged containers.

Different types of medicines for animals

1. **Medicines given by mouth** include the following types:
   - **Tablets**.
   - **Boluses** - a bolus is simply a large tablet.
   - **Capsules** - capsules consist of a powder containing the medicine encased in a protective shell. When the capsule reaches the stomach, the outer shell dissolves and the medicine is released to do its job.
   - **Drenches** - a drench is a liquid medicine which is given by mouth. In cattle, goats and sheep, it can be given by a specially designed applicator or by using a long necked drink bottle.
   - **Powders** - powders are mixed with the feed or water and fed to the animal. These powders contain medicines which kill germs or worms.
   - **Mineral blocks** - solid mineral blocks are tied to the wall of the khola where they can be licked by cattle or goats. Trace ingredients in the blocks can prevent dietary deficiencies.
2. **Medicines given by injection** can be given under the skin (subcutaneous) or into the muscle (intramuscular)*. The medicines in these injections will spread throughout the animal's body. These types of medicines include:
   - **Antibiotics** - an antibiotic kills germs. It does not kill all germs, it is better at killing some types of germs than others. For some types of germs, an antibiotic may have no effect at all. Antibiotics should always be given according to the directions given. Always give the full course. Do not stop treatment early just because the animal looks better - a few germs may still be alive in the animal's body and these will come back to make it sick again.
   - **Anti-parasitic medicines** - examples are dewormers which can be given by injection. (See the example label above).
   - **Iron injection** for piglets and calves as well as other **vitamins** and **minerals**.
   - **Other** medicines with a wide range of actions.
3. **Medicines given on the skin** include:
   - **Ointments** and **oils** for wounds. These have medicines which kill germs and help wounds heal.
   - **Wound sprays**. These also have medicines which kill germs and help wounds heal.
   - **Powders** for wounds. These also have medicines which kill germs and help wounds heal.

* **Some medicines can also be injected directly into the vein so that the medicine enters the blood stream directly**. **However, this is a specialised procedure which should only be done by experts.**

- **Sprays** for parasites. These have medicines which kill insects such as lice and ticks. They are usually applied using a knapsack sprayer.
- **Dips** for parasites. These are tanks containing medicines which kill insects such as lice and ticks.
- **Pour-ons**. These are medicines which can be poured on the skin of the animal. They contain medicines which slowly spread over the body surface, killing external parasites.
- **Foot baths**. Sometimes foot rot is treated by getting the animals to walk through a bath containing medicines which kill the germs which cause foot rot.

4. **Medicines put in the eyes** include:
   - **Sprays** or **eye drops** with medicines to kill germs and soothe pain.
   - **Powders** which are designed for use on the eye to kill germs.
   - Never take a risk with the eye. If a product is not specifically recommended for use in the eye, never try to use it in the eye.
5. **Medicines for the udder** include:
   - **Antibiotics** to kill germs inside the udder. These are in tubes which can be placed into the teat canal (See notes on dairy cattle).
   - **Teat dips** and **milking salve**. These are liquids which are applied to the teat of dairy cows. These products contain medicines which kill germs and make the skin of the teat soft so that it does not crack.
6. **Medicines placed into the uterus** include:
   - Pessaries which contain medicines to kill germs and help the uterus get back to normal after parturition (giving birth).

Dose rates for medicines

Exercise:
Visit a farm which has several goats and several cattle which have been weighed using a weigh band. Guess the weight of one of the cattle and write down your estimate. Then compare your guess with the actual weight based on the weigh band. Repeat this exercise for the next of the cattle until finished. Then repeat the exercise for the goats.

See if you can improve your accuracy.

- It is often necessary to know the weight of an animal so that we can calculate how much medicine we should give it. The best way to do this is to put the animal on a scale which gives an accurate reading of its weight. However, often such scales are not available. Therefore, for cattle and goats, weigh bands can be used to get an approximate estimate of the animal's weight.
- If a weigh band is not available, the weight of animals can be estimated using one of the tables at the end of this unit.

Session 2: Some common medicines

Session Objectives:

At the end of this training session, each participant should:

1. **Know what medicines are commonly used for what diseases**
2. **Know the manner of administration and common precautions for the commonly used medicines**

Vaccines

- If a germ attacks an animal, it becomes sick. If the animal recovers, its body develops a defence mechanism called "immunity". If it is attacked by the same germ a second time, the defence mechanism destroys the germs and the animal does not become sick.
- A vaccine is used to create immunity in an animal so that if it is attacked by a germ, it already has a strong system of defence.
- Vaccines take about two weeks to develop the defence system.
- Vaccines are used for **prevention** of disease. They are of **no use as a treatment** for disease. Vaccines do not fight off a disease, they prepare the body for defence against a future attack of the disease. Vaccines do not do this immediately and therefore cannot be used once the disease has struck.
- A vaccine prevents only the one disease it is designed for. It will not protect against other diseases.
- There are a wide variety of vaccines for use in animals. Some which are commonly used in Malawi include:
  - Newcastle disease vaccine for prevention of Newcastle disease in poultry. There are several different types of vaccine, most of which can be administered as a drop in the eye of each chicken. All village chickens should be vaccinated against Newcastle disease several times each year.
  - Rabies vaccine to prevent rabies. Vaccination against rabies is most important in dogs because dogs are the animal which poses the biggest threat to man through transmission of rabies. However, other animals and livestock can be vaccinated to protect them if there is a high risk of them being bitten by a rabid animal.
  - Blackquarter vaccine for prevention of blackquarter in cattle. This vaccine is an injection and should only be used in areas where blackquarter is known to have occurred in the past.

- Tick-borne diseases. There are vaccines for ECF, babesiosis, anaplasmosis and heartwater. However these vaccines all require special skills and should only be administered by an expert.

Disinfectants and wound treatments

- These are products which are used for killing the bacteria which cause or exacerbate wounds and skin lesions.
- They are generally spread over the lesion using a swab or clean cloth.
- It is often necessary to cleanse the wound with clean water before administering disinfectants. The reason for this is that extraneous material like pus, scabs or dirt will prevent the disinfectant from doing its job.
- Some commonly used products in this category are:
  - Stockholm tar, wound oil. These are applied directly to the wound to kill germs and protect it from flies.
  - Tincture of iodine, acriflavine. These are used where we want the wound to be left dry and usually uncovered.
  - Alcohol. A good disinfectant which is often used in first aid or for cleaning of instruments.
  - Dilute bleach (sodium hypochlorite). Plain household bleach liquid which has no other scent or colouring additives can be used in a dilute form as a cleansing and disinfecting agent. It must be diluted one part of bleach liquid to 20 parts of water before use on an animal.

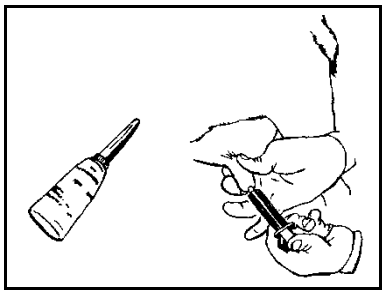
Footrot treatments

- These products are for treatment or prevention of footrot in sheep or goats.
- The general manner in which they are used is to prepare a foot bath through which the animals must walk.
- Some commonly used products in this category are:
  - copper sulphate or zinc sulphate which must be diluted one part of copper sulphate or zinc sulphate to nine parts of water.
  - formaldehyde solution, which normally comes as a 40% solution. This must be diluted one part of formaldehyde solution to eight parts of water.

Antibiotics - injectable, tablets, pessaries, sprays, ointments, intra-mammary

- Antibiotics are medicines which kill bacteria. They do not kill viruses. Some are injected, some are given as tablets, others are given as ointments or powders or sprays. It is important not to allow excessive unnecessary use of antibiotics because such use may lead to the development of resistance to the antibiotic.

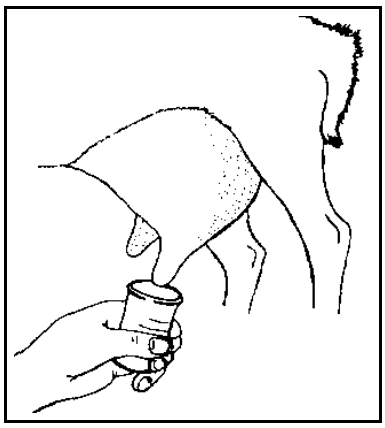
- Injectable antibiotics are given as an injection usually into the muscle of the neck or rump.
  - Some commonly used products in this category are long acting oxytetracycline, oxytetracycline, a mixture of penicillin-streptomycin, and less commonly other antibiotics.
- Antibiotics can also come as tablets but these are not used in livestock.
- Antibiotics can be included in boluses which are designed for insertion into the uterus of cattle just after calving. These products help prevent infection in the uterus.
- Some antibiotics come as sprays or ointments for use on wounds or in the eye. It is important that you do not use in the eye any product which is manufactured for application elsewhere on the body. If the label does not say the product can be used in the eye, do not use it in the eye.
  - Some antibiotics which are commonly found as the active constituent of sprays or ointments include oxytetracycline, chloramphenicol, tetracycline, neomycin and sulpha drugs.
- Another category of antibiotics are for intra-mammary use for treatment or control of mastitis in dairy cows. These are liquids which come in tubes with a thin nozzle. They can be inserted into the teat canal (where the milk comes out) and the contents can be squeezed from the tube into the teat cavity. Some commonly used products in this category are:
  - various mixtures of penicillin, streptomycin, cloxacillin and other antibiotics. These are manufactured specifically for use in dairy animals.



How to use an intra-mammary antibiotic
(Courtesy FAO "A manual for the primary animal health care worker")

Teat dips

- Teat dips are a type of disinfectant which is specifically designed for use on the teats of dairy cattle.
- The purpose of using a teat dip is to reduce the likelihood of mastitis, an infection in the udder.
- The teat dip is put into a cup. When the farmer has finished milking the animal, the teat is immersed in the cup containing teat dip. This kills bacteria which are on the skin around the teat entrance.



How to apply a teat dip
(Courtesy FAO "A manual for the primary animal health care worker")

Anthelmintics - drenches, powders, and injectables

- Anthelmintics are products which kill worms.
- Some anthelmintics are given as a liquid by mouth (a drench). Others are injected. Some are in powder form and can be added to the feed. (Sometimes anthelmintics are available as pour-ons, ie products which are put on the skin along the back line.)
- Some commonly used products in this category are:
  - ivermectin and avermectin: these are often available as injections
  - benzimidazoles (eg mebendazole, fenbendazole, oxfendazole, albendazole, thiabendazole): these are often available as drenches
  - levamisole or tetramisole: these are often available as injections
  - piperazine: this is usually available as a powder

Acaracides and insecticides for livestock, dips and sprays, pour-ons, dusting powders

- These products are for killing ticks, lice, flies and mites which annoy or harm livestock.
- Some acaracides and insecticides are designed for use in a plunge dip. The dip chemical is thoroughly mixed with water in a deep bath. The animal swims through the bath and thereby gets soaked with the solution. Many of these acaracides and insecticides can also be used in a sprayer which is used to soak the animal with the solution.
- Some acaracides and insecticides are available as pour-ons. These are applied on the skin right along the back line of the animal. Pour-ons are not diluted with water.
- Still other acaracides and insecticides are available as dusting powders. These are often designed for treatment of pests of poultry.

- It is very important to get the correct strength when diluting dips and sprays. Make sure you read the label and fully understand the directions for use of the product. If you are not sure, ask an expert first. Incorrect use of these products can cause the death of animals.
- When pour-ons are used, it is important to place the chemical on the correct region of the animal's body. The label will indicate how to correctly apply the pour-on. With pour-ons, it is also important to use the correct dose. Smaller animals will often have a different dose from larger animals.
- Some commonly used acaracides and insecticides are:
  - organophosphates: chlorfenvinphos, coumaphos, malathion
    - some products containing malathion can be used for poultry and poultry houses to kill external parasites
    - some people use pirimiphos-methyl (Actellic) to kill mites in poultry houses
  - amitraz, often used for control of ticks and for treatment of mange
  - synthetic pyrethroids: alphamethrin, cypermethrin, deltamethrin, flumethrin

Coccidiostats for poultry

- These products are for control of coccidiosis in poultry.
- They are generally added to the feed or water so that each chicken gets a suitable dose.
- It is important to use the correct usage rate. If you are not sure, ask an expert first.
- One commonly used product in this category is amprolium. Some sulpha drugs are also used as coccidiostats.

Bloat treatments

- These products are designed to reduce bloat in ruminants. Bloat is caused by too much gas or froth in the rumen.
- Products used for bloat are given as a drench.
- Some commonly used products in this category are plain cooking oil, or commercial products especially designed for treatment of bloat.

Non antibiotic treatments for diarrhoea

- Kaolin or bentonite (China clay) can be used to slow down bowel movements. These product do not kill worms and they do not kill germs. Both are a white powder.
- They can be used to reduce diarrhoea in cattle, goats or pigs.
- Give 200-250 gm for cattle; 150 gm for pigs or goats.

Oral rehydration fluid

- Oral rehydration fluids are used to replace body water which has been lost through diarrhoea or vomiting.
- There are commercially available "oral rehydration therapy" or "oral rehydration salts" which can be purchased from pharmacies.
- A useful oral rehydration fluid can be made by adding 6 teaspoons of sugar and half a teaspoon of salt to 1 litre of clean, warm water.
    - Give this as a drench or from nipple bottle. Sheep or goats give 500 ml 4 times a day for 3 days. Larger animals give 5% of body weight 2 times a day.

Other medicines

- There are lots of other medicines which do not come within any one category listed above. Some examples which are often used in Malawi include:
    - parvaquone or buparvaquone injection for treatment of East Coast Fever
    - imidocarb injection for treatment of babesiosis or anaplasmosis
    - certain hormones for treatment of infertility or manipulation of reproduction

Annex 1

Estimating the weight of cattle based on the girth

- Measure the girth around the chest, just behind the front legs. Calculate the weight using the following table.

Girth (cm)	Weight (kg)
65	25
70	32
75	40
80	47
85	56
90	65
95	76
100	89
105	102
110	117
115	133
120	151
125	169
130	189
135	210
140	232
145	256
150	281
155	307
160	334
165	363
170	393
175	424
180	459
185	490
190	526
195	561
200	599

Annex 2

Estimating the weight of pigs based on the girth

- Measure the girth around the chest, just behind the front legs. Calculate the weight using the following table.

Girth (cm)	Weight (kg)
50	15
55	21
60	27
65	35
70	42
75	50
80	58
85	68
90	77
95	88
100	99
105	114
110	129
115	147
120	164
125	180
130	196
135	217
140	237
145	250
150	262

Annex 3

Estimating the weight of goats and sheep based on the girth

- Measure the girth around the chest, just behind the front legs. Calculate the weight using the following table.

Girth (cm)	Weight (kg)
25	2
30	3
35	4
40	7
45	11
50	15
55	19
60	25
65	31
70	37
75	43
80	50
85	57
90	67
95	77
100	86
105	97