

TICK BORNE DISEASES, PREVENTION AND TREATMENT (Level 3)

Topic	Training & information Content
9.1	Introduction to Animal health (Prevention vs curative health care)
9.2	Health signals
9.3	Biosecurity of dairy farms
9.4	Tick born diseases (Prevention and treatment)
9.5	Worm infections (Prevention and treatment)
9.6	Vaccination schedule and planning
9.7	Mastitis prevention and treatment
9.8	California Mastitis Test
9.9	Usage and storage of veterinary medicines on dairy farms
9.10	Administering of medicines to dairy cows
9.11	Instruction use of injectors into teat canal
9.12	Key performance indicators (KPIs) for monitoring health status of dairy herd



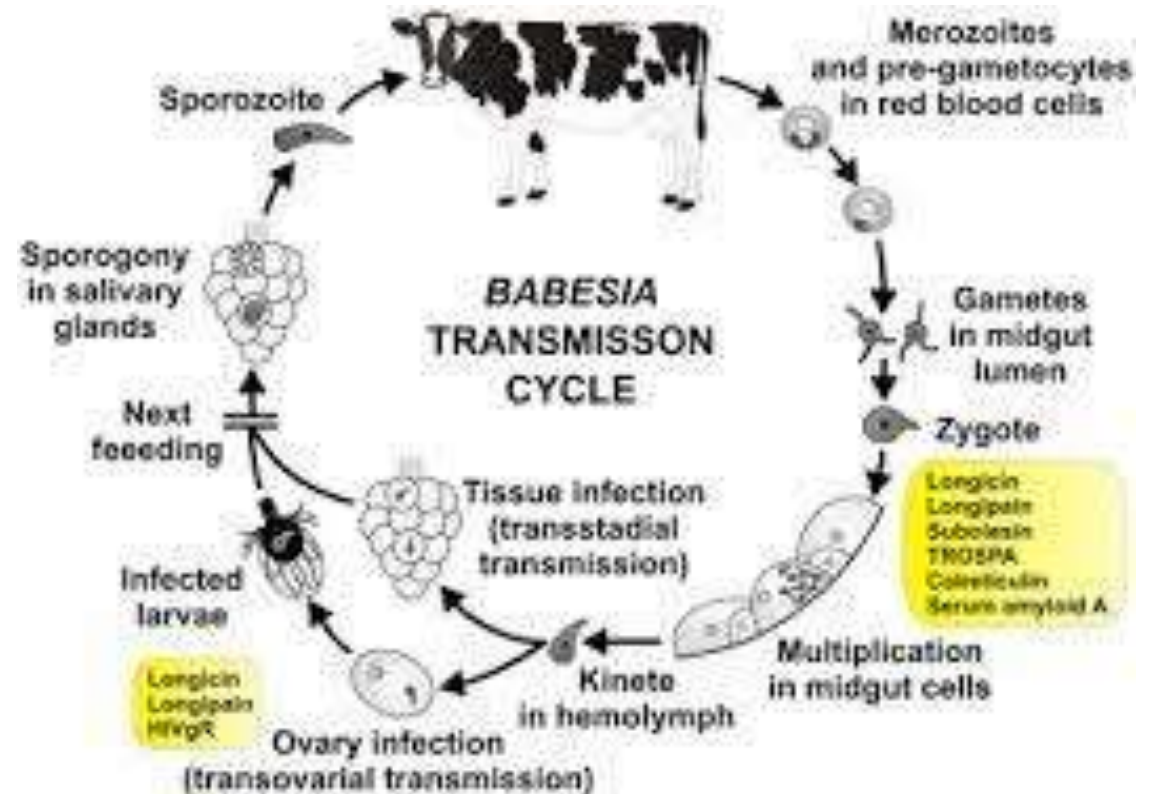
1. You will learn about (learning objectives):

- How to prevent and reduce tick-borne diseases in a dairy farm.
- How to spray a cow using acaricides.
- How to prevent tick resistance against acaricides.
- How to choose the proper acaricide.
- How to construct a crush.
- How to treat a cow with tick borne diseases.



2. Introduction

- Tick-borne diseases are a major issue in most farms, cattle get sick and die from it.
- To prevent tick-borne diseases, spraying with acaricides is weekly done in most dairy farms.
- The costs for spraying are often one of the highest cost dairy farms incur.
- However, the results of spraying are often disappointing.
- This module gives solutions on how to minimize these disappointments, prevent and treat tick-borne diseases in an optimal way.



Lifecycle of a protozoa causing a tick borne disease (Babesiosis)

3. Preventing TBD: The 10 Golden rules

- In the last couple of years, a group of 50 extension workers developed a systematic approach to decrease the number of cattle dying on dairy farms in the South West of Uganda.
- This program was called the 10 golden rules of tick-borne disease prevention.
- It appeared to be very successful and the number of cattle dying on tick-borne diseases decreased significantly.
- The program works by identifying points for improvement by the participating dairy and by introducing step by step, the 10 golden rules.



4. Rule 1: Close the farm for animals from outside

- Introducing newly bought animals is a potential hazard. They can be infected with tick borne diseases. This includes cattle, goat and sheep.
- Appropriate action is difficult, possible recommendations are:
 - Close farm, do not buy animals.
 - Keep new animals under quarantine for at least 2 weeks.
 - Test the animals for diseases. This will be hard for tick borne diseases, but a new bull should be tested on Brucellosis.
- Immediate action should be taken, but it is not crucial for a successful tick-borne disease prevention program. Sensitizing the farmer is the most important.
- All animals going in and out the farm are a potential hazard for bringing in tick-borne diseases.



To minimize the risk of entrance of infectious diseases at dairy farms is called **BIOSECURITY**. Infectious diseases are caused by bacteria, protozoa, viruses and fungi.

4.1 Rule 1 Cont'd: Close the farm for animals from outside

- If a farm is well fenced and no animals from outside come in, the risk of new infections with tick-borne diseases are minimal.
- Not only for cattle going out, but especially for cattle, goats and sheep to come in.



4.2 Rule 1 Cont'd: Close the farm for animals from outside

Double fencing

- The first dairy farms build in East Africa before acaricides were widely used were double fenced to keep other animals out.



Example of double fencing and a map of a double fenced dairy farm



5. Rule 2: Make pastures an unfriendly living environment for ticks

- The less ticks on the farm, the smaller the risk.
- Ticks do not like flat meadows, they like long grass, bushes and shrubs.
- Possible recommendations;
 - Clear pastures from bushes and shrubs.
 - If possible, mow away old and long grass.
 - Make paddocks, so you can practice rotational grazing. When pastures are free from animals for a longer time, ticks will die and less and less ticks will survive on the pasture.
- The rule not is not crucial for a successful tick borne disease prevention program. Immediate action is not required.
- Every farm can make some improvements here.



5.1 Rule 2 Cont'd: Make pastures an unfriendly living environment for ticks

- Bush clearing helps to make pastures less attractive to ticks.
- Burning pastures not only fertilize, but also remove the ticks.
- Mowing also creates an unfriendly environment for ticks.



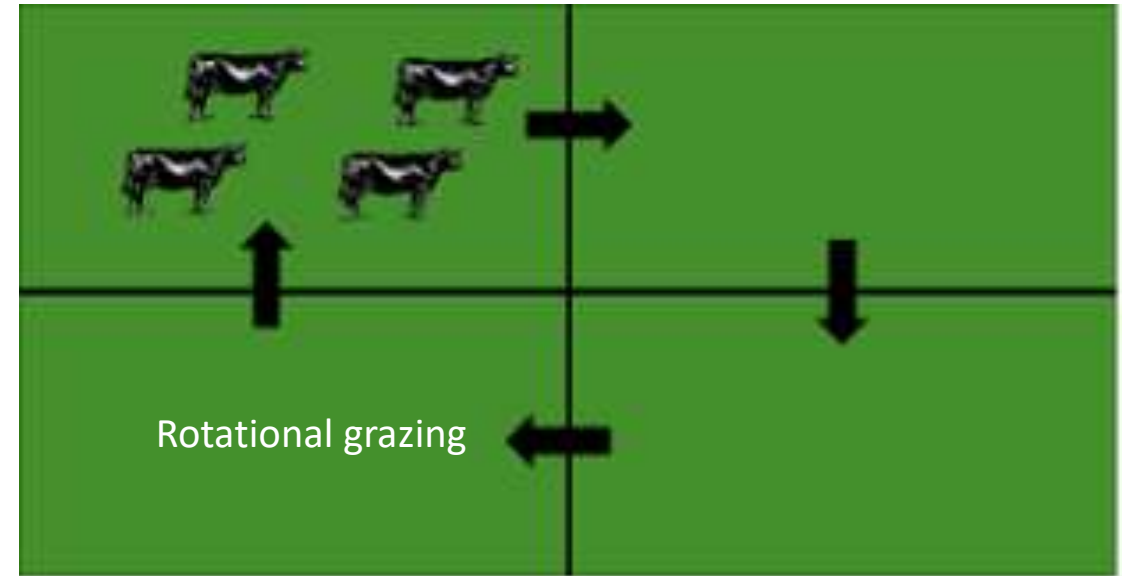
Mowing after grazing to remove bad grasses helps to reduce tick pressure



5.2 Rule 2 Cont'd: Make pastures an unfriendly living environment for ticks

- By paddocking and practicing rotational grazing, you give pastures rest for a while and a great numbers of ticks will die.
- In a clear pasture without grazing for a few weeks the fast majority of ticks will die.

Goats will still pass this cattle fence



Cattle grazing in fresh pasture



6. Rule 3: Construct a good crush

Every Dairy farm should have a crush

- A crush makes possible to spray the cow completely. The floor of the crush or the waiting area should not be muddy. When the legs of cattle are covered with mud, the acaricide cannot penetrate the skin of the animal.

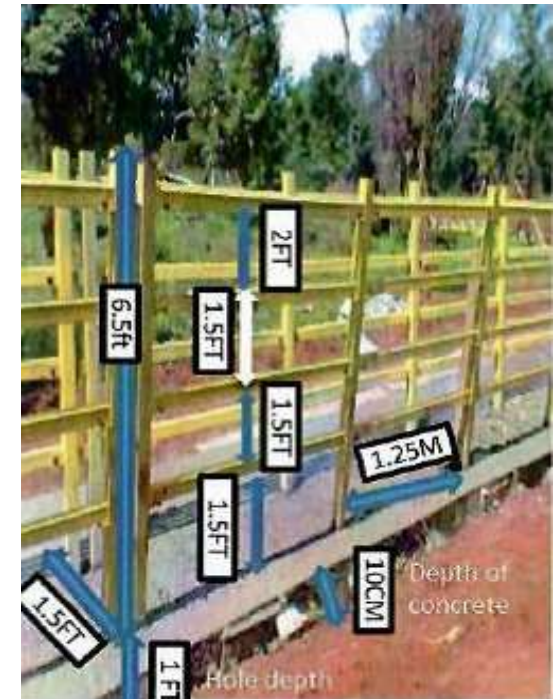
Recommendations:

- The crush needs to have the right dimensions. Narrow at floor level and wider when going up.
- The crush has to be easily accessible for animals without any possibility of hurting them.
- The floor should be made of concrete or gravel and the waiting area needs to be dry.

Appropriate and recommended crush
(A good crush with one row of cattle)



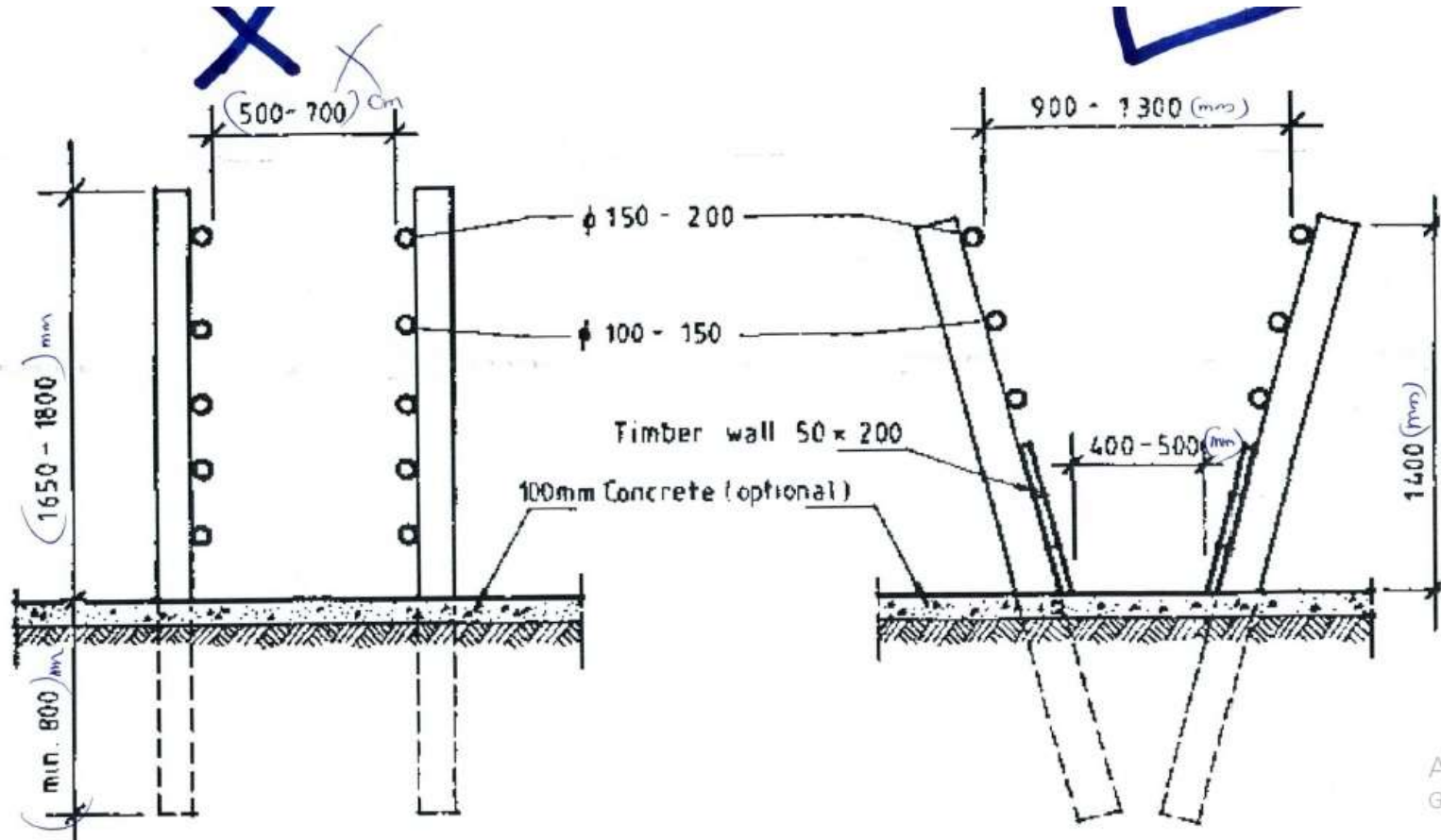
FRONT VIEW



SIDE VIEW OF THE CRUSH

6.1 Rule 3 Cont'd: Construct a good crush

Drawings of two crushes



The drawing to the right is preferable. All younger animals fit in well.

6.2 Rule 3 Cont'd: Construct a good crush



To the left a poor crush.

- Bad floor.
- Too wide, cattle will stay next to each other.
- Many side boards, which makes spraying difficult.



To the right a well constructed crush.

- Good floor.
- Narrow, so cattle stay behind each other.

6.3 Rule 3 Cont'd: Illustrating a poor crush



A poorly constructed crush where cattle stand next to each other, which makes complete spraying of the cow nearly impossible.

6.4 Rule 3 Cont'd: Illustrating a poor crush



7. Rule 4: Prepare the acaricide in the right concentration

- A low concentration is not effective and will induce tick resistance.
- A high concentration is also not effective and on top of that, is expensive.
- Follow the instructions on the label of the package.
- Measure the acaricide with the supplied measuring beaker or with a medicine syringe.
- Also make sure that you have the right amount of water.



General guide:

Amidines	40 ml in 20 litre
Pyrethroids	20 ml in 20 litre
Organophosphates	10 in 20 litre

*But always read label.



7.1 Rule 4 Cont'd: Prepare the acaricide in the right concentration

- Calibrate the jerry can if it contains 20 litres.
 - i. You can do this on a weighing scale;
 - If you use a measure cup, calibrate this one as well. At field tests it appeared that measure cups purchased together with the acaricide bottle had deviations over 10% of the measured amount.
 - ii. You can calibrate with a medical syringe;
 - Or do not use a measure cup, but use the syringe.



8. Rule 4: Prepare the acaricide in the right concentration

- Read the instructions on the bottle carefully.
- Remember acaricides or toxins penetrating the skin, so wear protective gloves.



8. Rule 5: Spray at the right frequency

- Most acaricides have to be sprayed once a week. There is one exception, the amidines (Nortraz, Bemutraz, Tactic), which have to be sprayed twice a week.
- Always read the label.
- When amidines are sprayed once a week, the chance on tick resistance increases.
- Changing this should be an immediate action.
- Amidines are expensive so should be used correctly, hence, convincing the farmer should not be so hard.

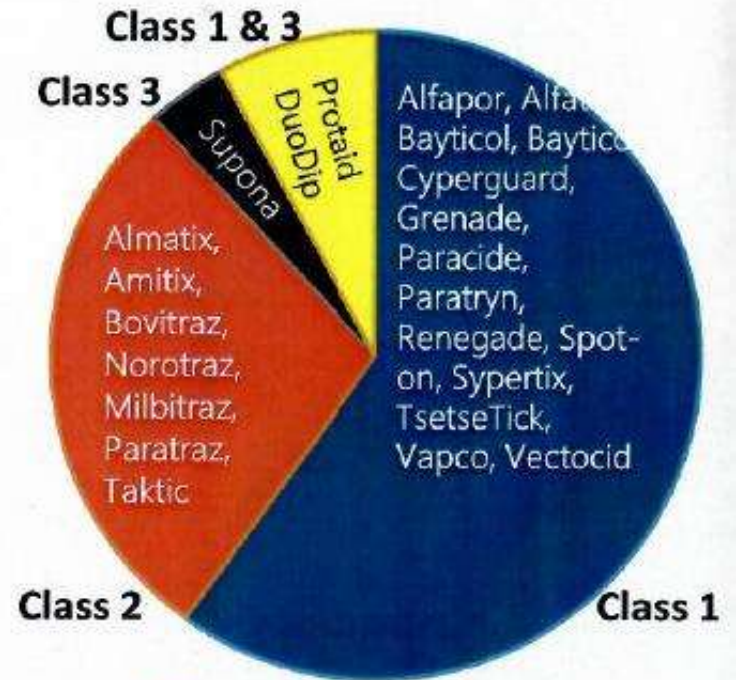
Key points

- There are many acaricides that have **different trade names but belong to the same family**
- Knowing the family to which an acaricide belongs help in **making appropriate decision on prescription, change and/or rotation**
- It is recommended that acaricides be procured from **licensed veterinary drug outlets**

Proper acaricide use

a. Class of acaricide

Know the class of the acaricide you are using at your farm



Class 1 ■ Synthetic pyrethroids

Class 2 ■ Amitraz

Class 3 ■ Organophosphate

Class 1 & 3 ■ Co-formulation

9. Rule 6: Spray in a correct way

- The whole body of the animal needs to be covered by the acaricide.
- Do not cause unnecessary stress for the animal. For example, handle animals quietly, do not hit them with sticks.
- The acaricide needs to cover the skin (wet hair is not enough). The acaricide needs to penetrate the skin to work properly.
- Spray according to this scheme – BBBRH.
 - i. Back
 - ii. Belly
 - iii. Brisket
 - iv. Rear parts
 - v. Head
- Spray from both sides of the crush.
- Make sure the pressure is high enough. Pressure from back spray is too low. You need at least 10 liters to cover the whole skin of the cow. With a bucket pump you need 5 liters per cow.
- You measure this by dividing the number of jerry cans multiplied by 20 liters through the number of animals in the crush.



Good spraying is a big advantage of a spray race.

9.1 Rule 6 Cont'd: Spray in a correct way

- Spray;
 - i. Back
 - ii. Belly
 - iii. Brisket
 - iv. Rear parts
 - v. Head
- Spray from both sides of the crush.
- Make sure not only the hair but also the skin gets wet.



9.2 Rule 6 Cont'd: Spray in a correct way

- A back spray often does not have enough pressure to wet the skin.

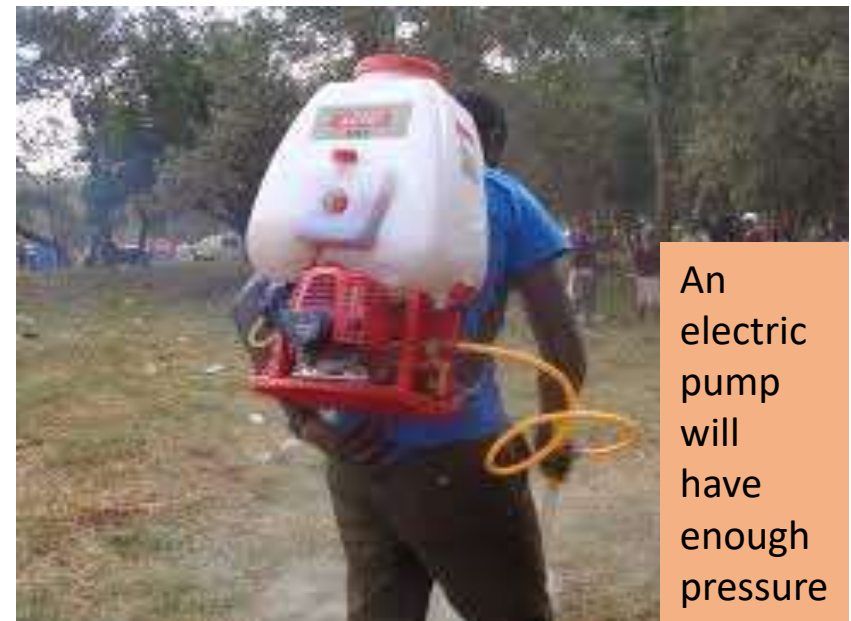
With a wide spray, the pressure will be too low, you need a stream not a nebula*



*Nebula is a diffuse cloud of gas or dust; here you need drops of the water/acaricide mixture.



With a back spray you need 10 litres



An electric pump will have enough pressure

9.3 Rule 6 Cont'd: Spray in a correct way

- You need enough acaricide to cover the body. In general this is 5 litres per cow.
- This means 4 cows per 20litre-jerrycan.
- Not enough acaricide can induce tick resistance against the acaricide used.

Adjust the nozzles correctly



This way it is very hard to spray cattle properly

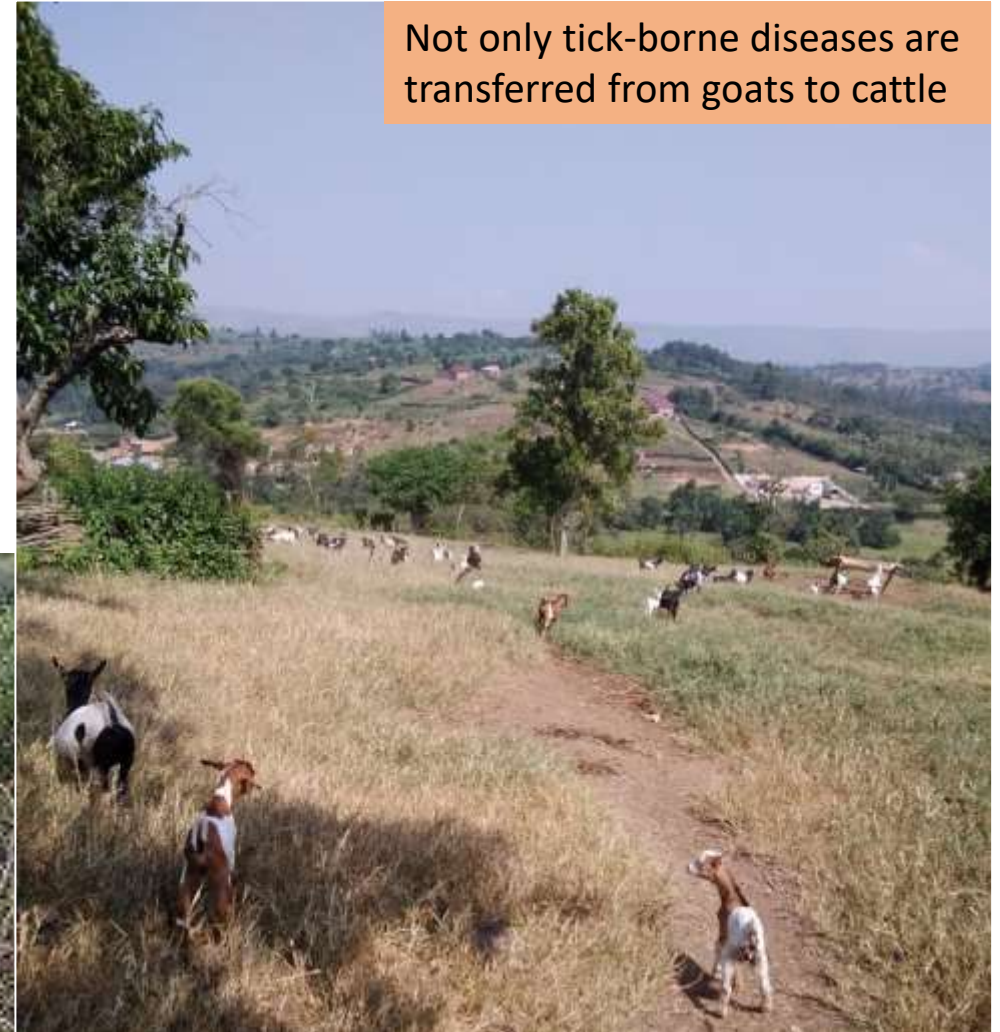


10. Rule 7: Spray all animals at the farm every spray turn

- Calves can get sick as well.
- Goats do not get sick, but they carry ticks.
- Even dogs can carry ticks.
- Spray goats preferably in a narrow crush or otherwise in confined area.
- This is important and immediate action is required when not done.



It is difficult to spray goats in a crush



Not only tick-borne diseases are transferred from goats to cattle

11. Rule 8: Rotate acaricides regularly

- When tick-borne diseases start to appear on the farm and you use the same acaricide for over three months; this becomes dangerous. Change!
- Change to avoid tick resistance.
- Change from one group of acaricide to the other e.g., Pyrethroids, Organophosphates, Amidines.
- A different name does not mean a different group. Check for that.
- Preferably, do not use acaricides with two components from two different groups. When tick resistance occurs against such a medicine only, one group stays as an alternative.
- As long as there are no problems with tick diseases on the farm no immediate action is required, you can even use the acaricide for more than 3 months.
- Otherwise, make a rotation scheme with the farmer.

b. Rotational acaricide use
Appropriate acaricide use starts with keeping records of acaricide use at farm level

Appropriate rotation informed by technical guidance is needed

c. Appropriate acaricide dilution

Key points

- You need to have a plan for both materials, labor and volume of acaricides to use for a given herd size.
- Strictly adhere to the manufactures recommended dilution
- Use the right materials for measuring and mixing equipments

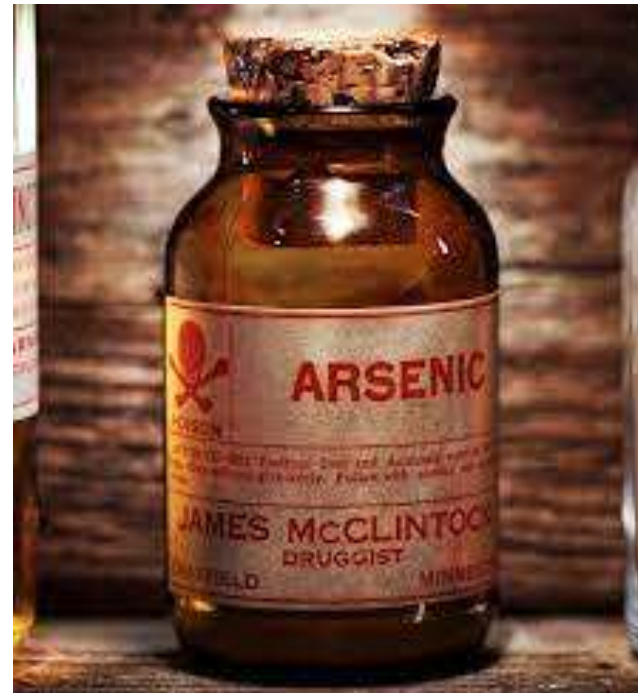
11.1 Rule 8 Cont'd: Rotate acaricides regularly



These are all amidines

12. Acaricides are poisonous

- Acaricides have been developed to kill ticks.
- They are many, but only three groups of acaricides have been registered to be used at dairy farms.
- Acaricides not only kill ticks, but also other insects. They are poisonous not only to insects but also to animals and man.
- Most of the acaricides are also used as herbicides and pesticides.
- Because of their toxicity and the possible harm they can do, only a few have been registered. These are the amidines, pyrethroids and organophosphates.
- A good working acaricide, ivermectin, is registered as herbicide, but for good reasons not as acaricide. It is a potential human health hazard.
- When using acaricides avoid skin contact. Acaricides penetrate the skin.
- Wear glasses, gloves, boots, cover hair and wear an overall.



The highly poisonous arsenic was one of the first acaricides to be used. Luckily it was already banned for many years back.

12.1 Acaricides are poisonous Cont'd...

- We want to emphasize the fact that acaricides are poisonous.
- Getting ill quick only happens after being exposed to high dosages.
- Long term exposure looks much more dangerous.
- Acaricides and their metabolites are often carcinogenic. In other words you have serious risk to develop cancer in the long term.



13. Rule 9: Only use registered acaricides

- Other medicines for instance pesticides can possibly be harmful for cattle. Blindness is associated with use of pesticides.
- Pesticides can be good acaricides, but dosage and frequency of use are unknown.
- Unregistered medicines can be a food safety risk. Abamectin for instance is not registered for milk cattle, because the medicine will be present in the milk and stays for a long time in the muscles (beef).
- When unregistered acaricides are used, change this immediately.
- Registered acaricides work when used in the appropriate way, the 10 golden rule program has proven it. Try to convince the farmer.



14. Rule 10: Treat sick animals in time and correctly

- Early recognition and treatment of the disease makes recovery more likely.
- Early treatment will stop spreading of the disease.
- Check the herd three times per day.
- Recognize the signs.
- Call a veterinarian.
- In case of doubt take temperature.
- Start treatment with recommended and registered medicines and use the right dosage.
- Tetracyclines do not cure East Coast Fever (ECF), a tick-borne disease.
- The animal body weight can be measure using a tape measure.
- Stick to withdrawal times of milk for food safety reasons.

