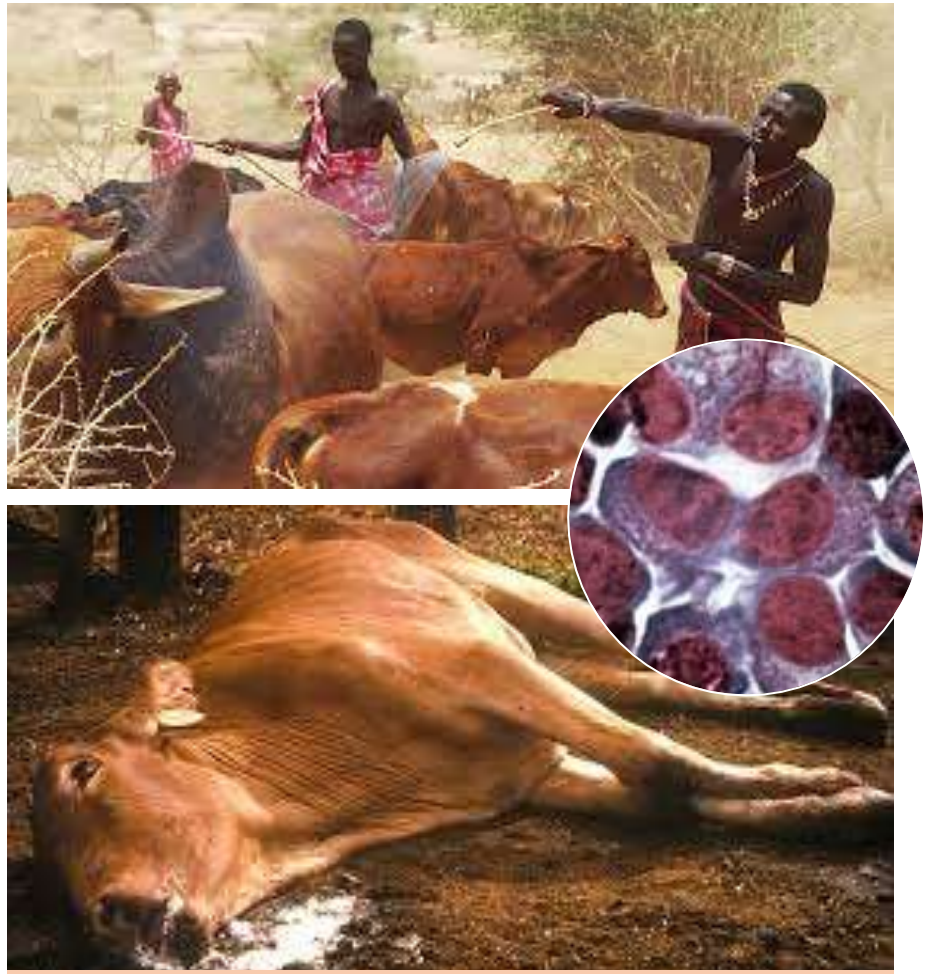
Theme 9: Animal Health

INTRODUCTION TO ANIMAL HEALTH (PREVENTION VS CURATIVE HEALTHCARE) 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):

- ❑ Types/kinds of diseases that affect cattle
- ❑ How cattle contract diseases
- ❑ How to prevent cattle diseases
- ❑ How to cure cattle diseases



East Coast Fever is one of the most devastating cattle diseases in East Africa.

2. Introduction

- To keep cattle healthy and cure them of sickness is (one of) the major challenge for a dairy farmer.
- This presentation gives some general information on;
  - What kind of cattle diseases are there,
  - how do cattle contract them,
  - how can you prevent the diseases,
  - and if they contact them, how do you cure them?

Mastitis is an issue at nearly all dairy farms.

3. Types/Kind of diseases that affect cattle

- Basically there are three types of causes for cattle to get ill.
  i. Infectious
  ii. Metabolic (including toxic)
  iii. Injury and intoxication

Traumatic reticulitis is caused by an injury (nail).

Sunburn is caused by an intoxication.

Foot & mouth disease is caused by an infection (virus).

4. Promoting cattle health: Animal Freedoms

- One of the ways to promote cattle health is to adopt the five animal freedoms.

1. Freedom from hunger or thirst by ready access to fresh water and a diet to maintain full health and vigour.
2. Freedom from discomfort by providing an appropriate environment including shelter and a comfortable resting area.
3. Freedom from pain, injury or disease by prevention or rapid diagnosis and treatment.
4. Freedom to express (most) normal behaviour by providing sufficient space, proper facilities and company of the animal's own kind.
5. Freedom from fear and distress by ensuring conditions and treatment which avoid mental suffering.

5. Infectious diseases

According to the world health organization:

- Infectious diseases are caused by pathogenic microorganisms, such as bacteria, viruses, parasites or fungi. The diseases can be spread, directly or indirectly, from one animal to another.

- Pathogenic organisms include;
  i. Bacteria
  ii. Viruses
  iii. Parasites (protozoa, worms, ticks, etc.)
  iv. Fungi.

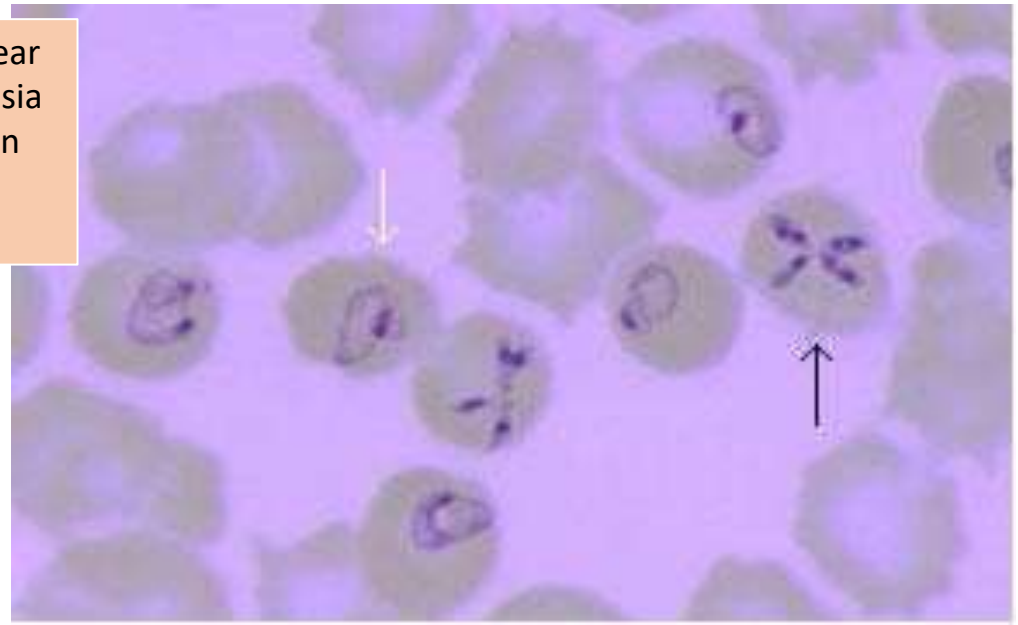
Endometritis is caused by a bacteria.

Ringworm is caused by a fungi.

Lumpy skin disease is caused by a virus.

6. Micro organisms

- Infectious diseases are caused by pathogenic microorganisms such as bacteria, viruses, parasites or fungi. The diseases can be spread directly or indirectly from one animal to another.
- An organism can be seen only through a microscope. Microorganisms include bacteria, protozoa, algae, and fungi. Although viruses are not considered living organisms, they are sometimes classified as microorganisms.



Blood smear with babesia infection in red blood cells.

Bacteria (streptococcus) as found in mastitis milk.

The fungi causing ringworm.

6.1 Micro organisms Cont'd…

Sometimes definitions are not correct!

- Some infectious diseases can be spread by clearly visible organisms.
- Worms are seldom seen because they live inside the body of the cow.

The flatworm causing fluke is few centimetres long.

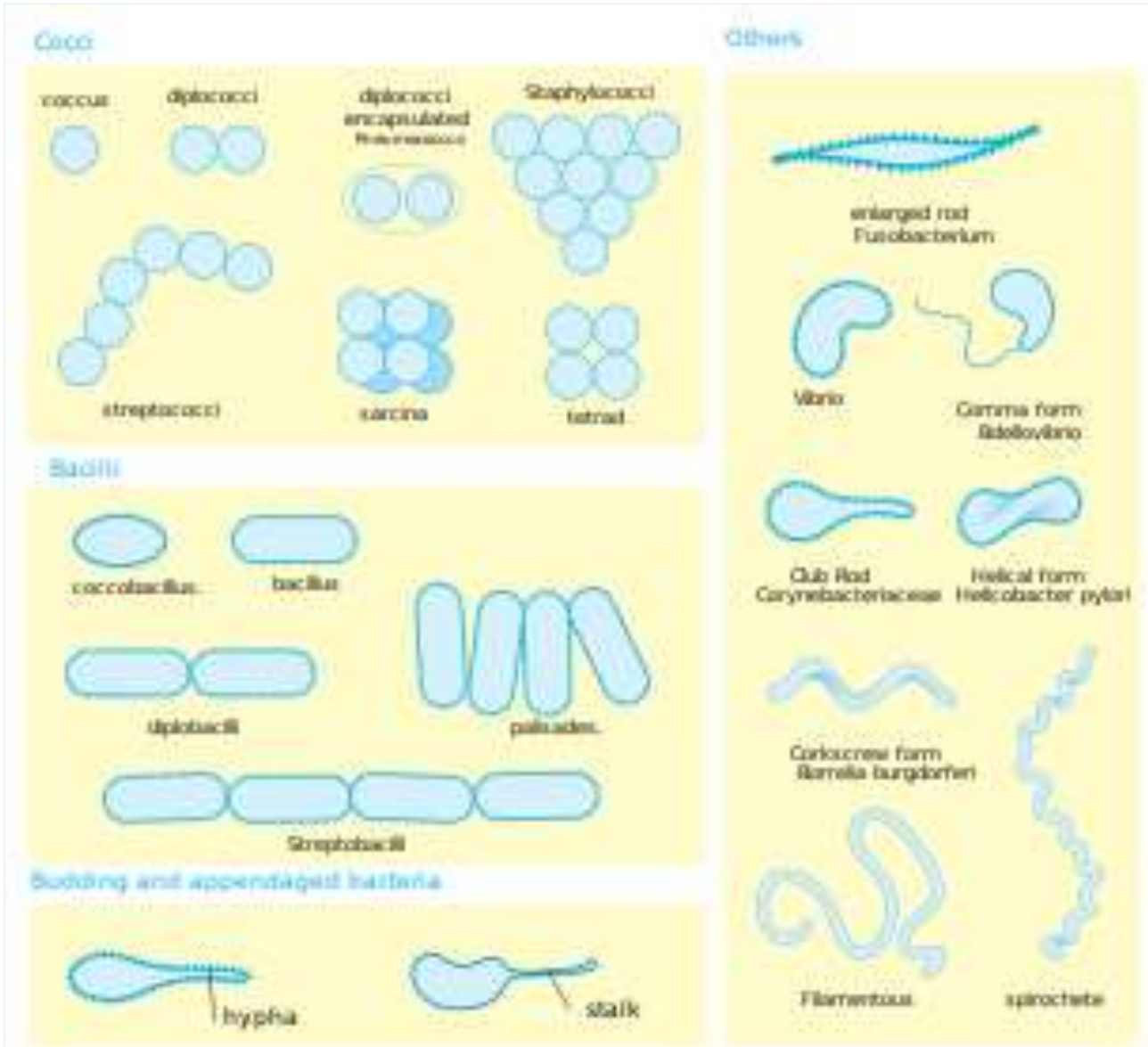
A tapeworm can be over a meter long.

A cow with so many ticks can get sick from the ticks.

7. Bacteria

- Bacteria are just one cell.
- They can multiply quickly (once per half hour) in preferential circumstances.
- Some are pathogenic, most them are not.
- They have different shapes.
- Some need oxygen others do not.
- In general they like warm and wet surroundings.
- They do not like heat, drought, alcohol, etc.

Bacteria have many different shapes. | **Source:** Wikipedia



7.1 Bacteria Cont'd…

Bacteria can cause diseases like:

- Mastitis
- Anthrax
- Tuberculosis
- Brucellosis
- Pneumonia
- Endometritis
- Many lameness

Brucellosis causes abortion and placenta's are highly infectious.

Anthrax is one of the most deadly diseases and not only in cattle.

Different bacteria can cause mastitis.

7.2 Bacteria Cont'd...

In most cases cattle lameness is caused by bacteria not by injury.

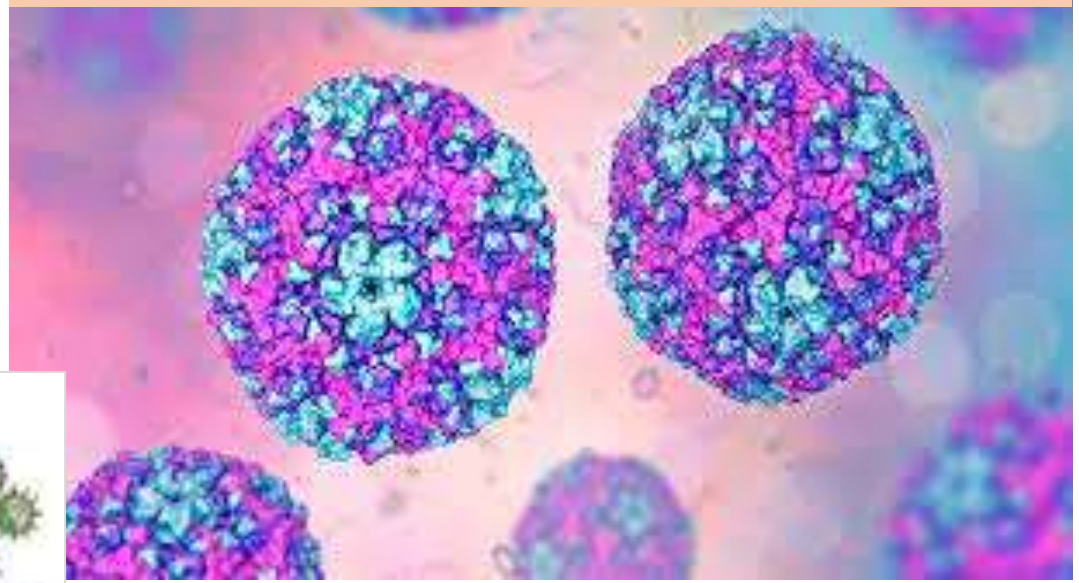
Retained placenta can lead to endometritis.

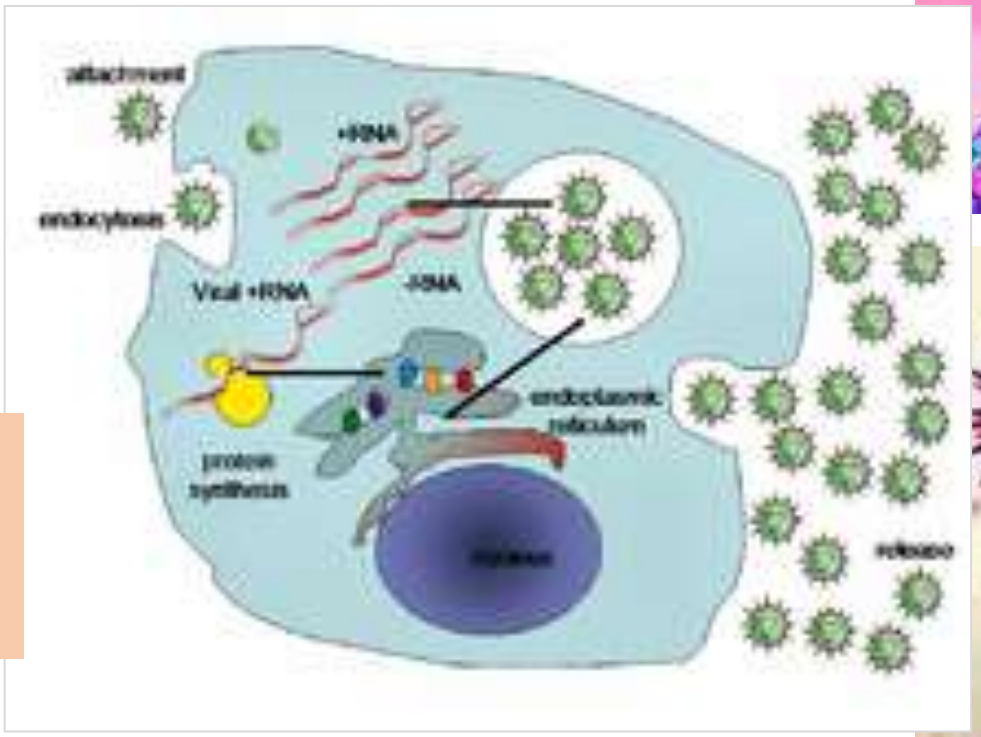
Tuberculosis is cause by a bacteria which is also infectious for men. This is called a zoonosis.

8. Viruses

- A virus is a submicroscopic organism that replicates only inside the living cells of an organism. Viruses infect all life forms, from animals and plants to microorganisms, including bacteria.

Picture of a foot and mouth disease virus with huge magnification

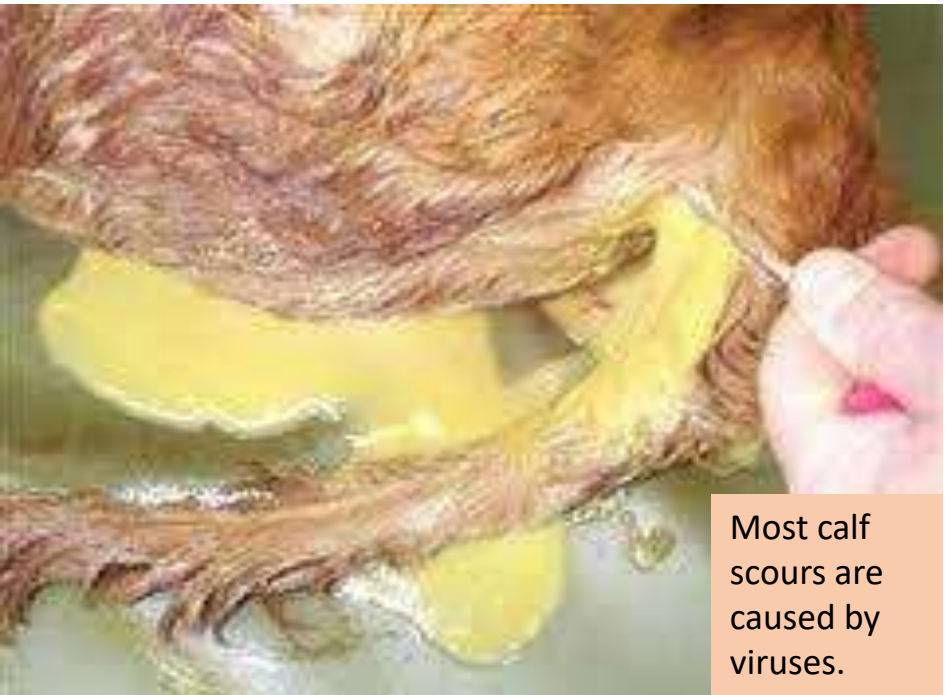




Virus penetrating and multiplying in cell.

8.1 Viruses Cont'd…

- Viruses can cause diseases like:
  - Foot and mouth disease
  - Lumpy skin disease
  - Bovine virus diarrhoea
  - Infectious Bovine Rhinotracheitis (IBR)
  - Calf scour (Rota/'Corona')

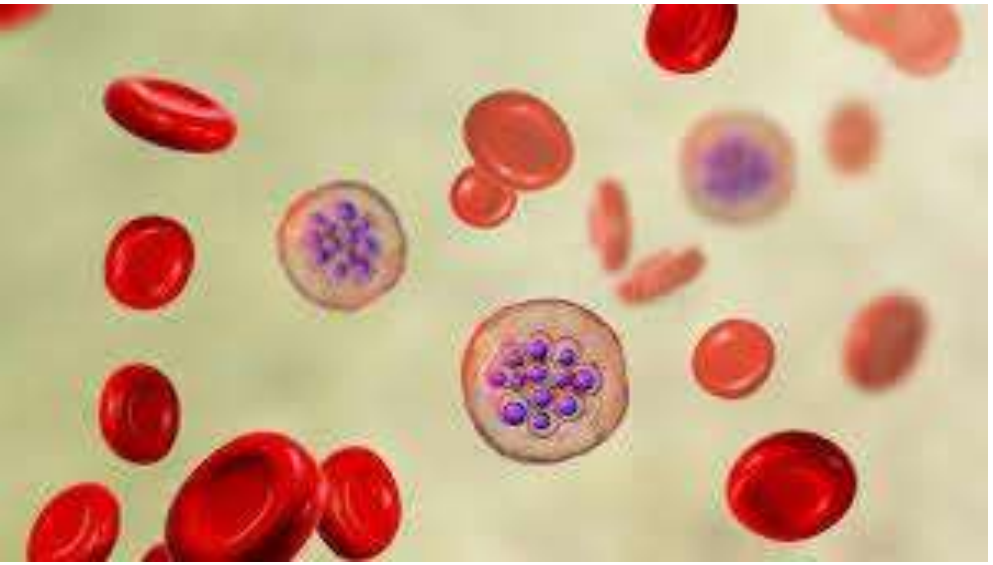


Most calf scours are caused by viruses.

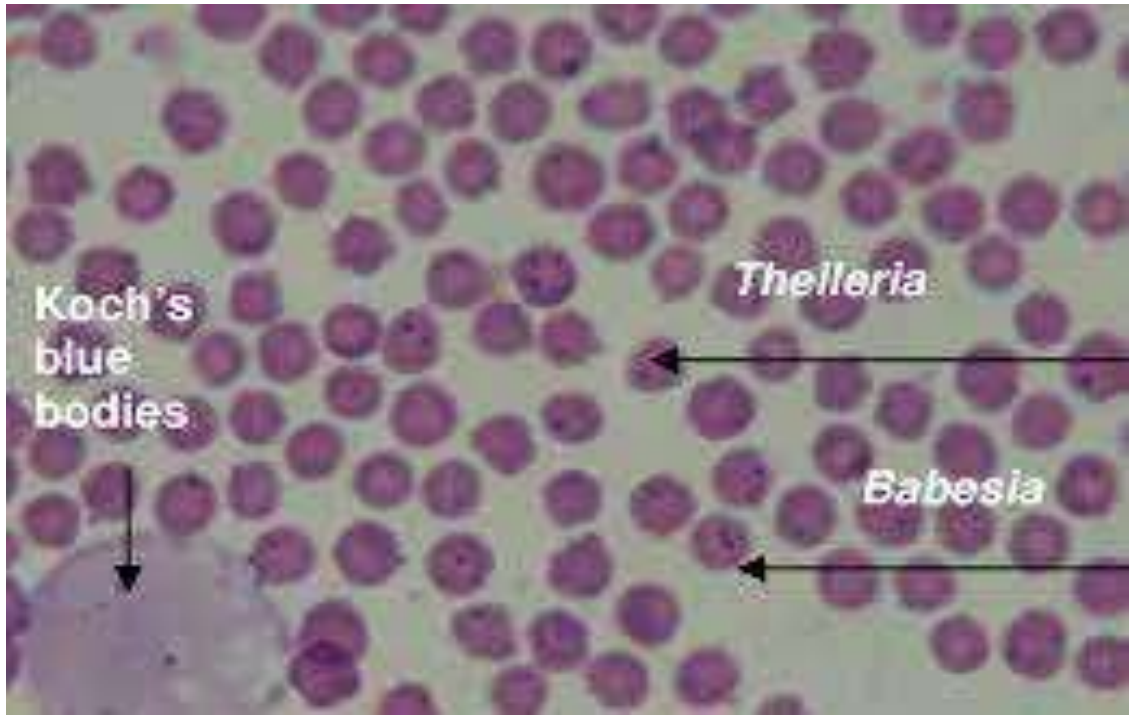
Lumpy skin disease.

9. Protozoa

- Protozoa is an informal term for a group of single celled eukaryotes, either free-living or parasitic, that feed on organic matter such as other microorganisms or organic tissues and debris.



The most (in)famous protozoon causes malaria (here in red blood cells).



Theilleria, the cause of East Coast Fever also lives in (white) blood cells.

Protozoal parasites live often in cells and can be diagnosed with blood smears.

10. Vectors

- Protozoal diseases are transferred by a vector.
- A vector is another living organism what carries the disease from one animal to the other.
  - In the case of malaria these are mosquitoes.
  - In the case of ECF it are brown ear ticks.
  - In the case of Babesiosis it is the Ixodes tick.

Ixodes tick, the vector for Babesiosis.

Brown ear Tick

Mosquitoes transfer malaria.

10.1 Vectors Cont'd…

- The only possible way of infection of protozoal diseases is by a vector, because the protozoa causing diseases can only live in cells.
- So all protozoal cattle diseases have a vector. This important when battling them.
- Also, some other cattle diseases are transferred by vectors, like:
  - Fluke, a flatworm transferred by snails.
  - Ehrlichia a bacteria causing heartwater is transferred by ticks.
  - The Rift Valley Fever virus is transferred by mosquitoes.
  - Historically and well known is the transfer of the plaque by rats.

Snails the vector for fluke.

The Amblyomma tick vector for heartwater.

11. Worms

- Two kinds of worms can cause problems in cattle;
  - Flat worms to be divided in fluke like worms and tapeworms.
  - Round worms of which nematodes are of interest for cattle like Trichostrongylus, Oesophagostomum, Cooperia, Ostertagia, Haemonchus and Dictiocaulus.

Liver with damaged bile ducts due to fluke

Ostertagi worms in a cow's omasum.

Flatworms in the reticulum stomach of the cow.

11.1 Worms Cont'd…

Symptoms of worm infections are not very specific and are rarely lethal.

- Cattle growth will decrease and ultimately they will get skinny.
- The haircoat gets rough.
- In severe cases of fluke they develop a bottle jaw.
- Production decreases.
- Developing diarrhea in rare cases.

Skinny with a rough haircoat

12. Fungi (ring worm)

- Diseases caused by fungi are rare in cattle.
- The only common one is ringworm.
- The fungi spreads by direct contact.
- Be careful it is a zoonotic because you can also get infected.

The fungi under a microscope.

Typical ringworm lesion on human skin.

13. Metabolic diseases

- These are diseases of cattle caused by productivity practices when the body reserves on calcium, magnesium or energy and cannot meet the metabolic needs.
- They are very important in places where high producing animals are required. This means that in East Africa they will become of importance.
- In cattle, metabolic diseases include;
  - Ketosis
  - Milk fever
  - Fat cow syndrome
  - Hypomagnesaemia
  - Abomasal displacement
- All these can produce an acute, temporary, but potentially fatal deficiency. Correcting the diet for cows during the period from late pregnancy to peak lactation is crucial in preventing these diseases. If these diseases occur frequently, it is essential to seek professional veterinary and nutritional advice.

Cow getting calcium infusion to treat milk fever.

Starting an abomasal surgery

14. Injuries and intoxications

- Injuries and intoxications are maybe not the most common diseases in cattle, but most of the time they are caused by human errors.

For an adult cow, a fractured leg is a one way ticket to the butcher.

Sunburn is caused by eating toxic plants.

Bacteria producing toxins can cause severe mastitis.

15. How to manage cattle diseases

- A disease free farm is utopia. So every dairy farmer needs to deal with diseases.
- Basically there are two things he or she can do.
  - Prevent animals from getting sick.
  - Cure animals who get sick.

16. Prevention of cattle diseases

- By preventing cattle diseases two things make the goals;
  - To increase the resistance of animals against diseases.
  - To lower the infection pressure of microorganisms causing cattle diseases.

You vaccinate cattle to increase resistance.

Biosecurity measures you take to decrease infection pressure.

Colostrum is necessary to get resistance.

17. Disease resistance

Resistance to diseases depends on:

- Immunity against infectious diseases.
- Quality of the feed: optimal energy and protein supply, fibers and providing sufficient minerals and vitamins.
- The presence of stress factors, like using sticks to get cattle in a crush, overcrowding at the watering place, very hot weather, long periods with limited water supply, calving, heat, regrouping, moving, ranking, discomfort, etc.
- Intact body barriers, like skin, teat holes, mucous membranes, etcetera.

In other words keep your cows happy.

18. Good dairy farming practices

The first step to a healthy heard is good dairy farming practice. Hence, have a day to day management in order like;

- Providing enough and clean drinking water.
- Feed a proper ration (difficult enough, this is the art of dairy farming).
- Have good milk technique.
- Give the necessary vaccinations.
- Avoid stress (of both farmer and animal).

Always keep the five animal freedoms in mind!

18.1 Good dairy farming practices Cont'd…

A good milk technique is key to protect the teats.

Banana stem and Napier grass hardly have any feed value.

19. Infection pressure

- Infection pressure indicates the number of pathogenic microorganisms and their ability to infect the animals in a farm.
- The lower the number of pathogenic microorganisms on your farm, the better it is for the health of your animals.
- Measures to decrease infection pressure are called biosecurity measures.

Disinfecting an entering car is external biosecurity.

Udder washing is internal biosecurity.

19.1 Lowering Infection pressure

- Lowering infection pressure aims for two things:

i. Making sure pathogen microorganisms do not enter the farm,
ii. Make life impossible for pathogen microorganisms or at least minimize the chances of survival.

Milking in a clean environment prevents mastitis.

Disinfection of the navel prevents bacteria to enter the new born calf.

Drying milk equipment kills bacteria.

20. Prevention versus cure

- The best way to keep cattle healthy is make sure they do not get sick.
- So prevention of diseases should be number one.
- If cattle get sick try to cure them as soon as possible.

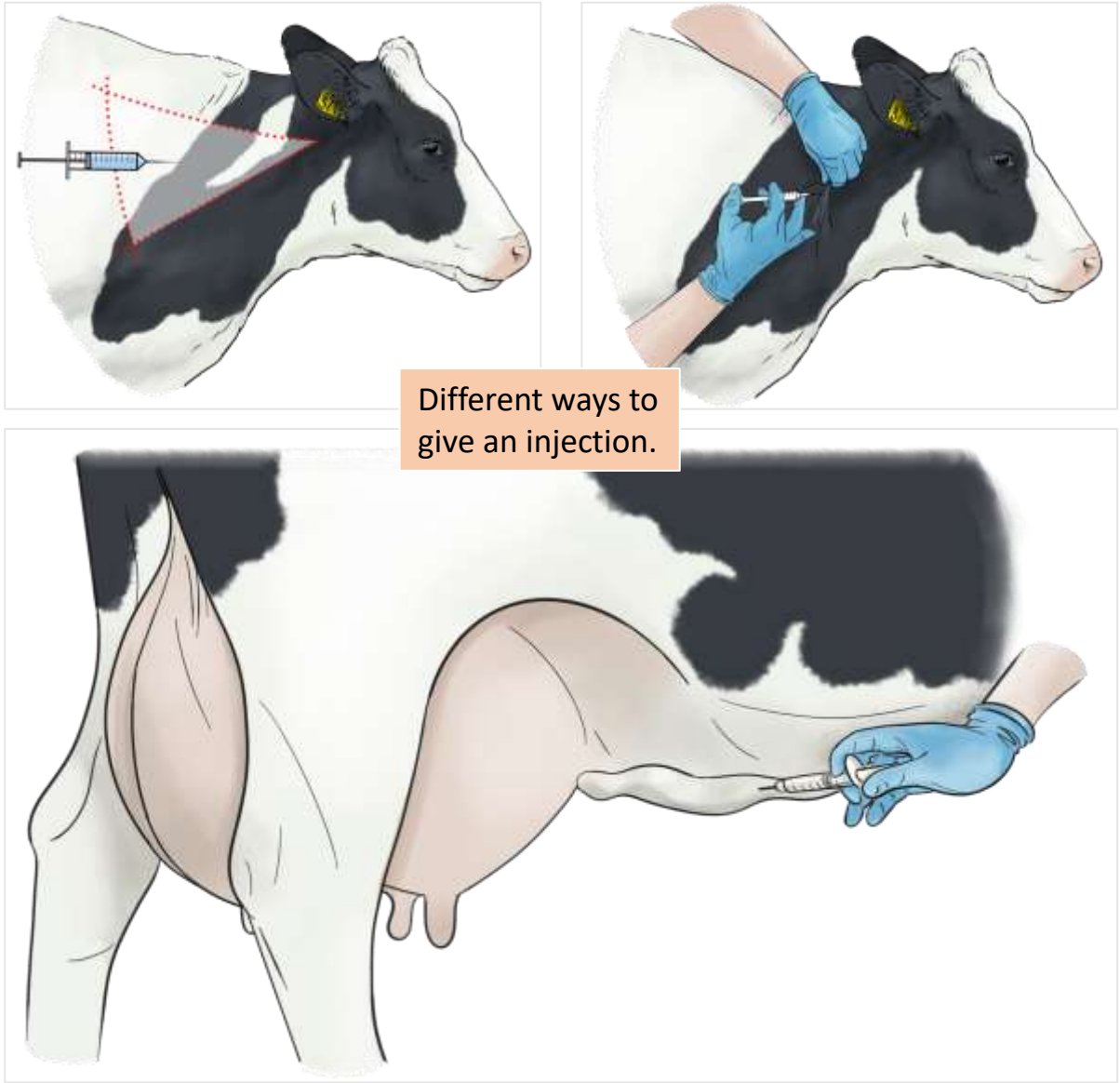
Keep observing the health of your cattle.

A farmer is not a vet. Call for his expertise when needed.

If playing doctor yourself do it right!

21. Prevention versus cure

- There are many ways to cure an animal.
- This is often done by giving medicines.
- Bandages can be used to treat wounds.
- Vets can do surgery.
- Most importantly:
  - Start treatment on time.
  - Make sure the diagnosis is correct.
  - Make sure you use the right medicine.
  - Do not hesitate to call an expert (vet).
  - Use only registered medicines.
  - Respect the medicine withdrawal time.



Different ways to give an injection.

22. Summary: Take home messages

Prevention is better than cure!

- Animal health is complicated.
  - There are many diseases.
  - They have different causes.
  - They have different ways of prevention.
  - They have different treatments.

- This presentation is meant to give some background knowledge in order to help to get a better understanding; NOT as a training to become a veterinarian.

- END -