

## Theme 9: Animal Health

# MASTITIS PREVENTION AND TREATMENT (Level 2)

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):

- What mastitis is.
- What bacteria are.
- What somatic cells are.
- How to prevent mastitis.
- How to milk a cow.
- How to clean and disinfect (hygiene)
- How to treat mastitis.

You will learn the theoretics and understanding behind the job. Only practice can give you the skills!



## 2. Introduction

Why prevention and treatment of mastitis is important:

- Healthy udders produce more milk.
- Healthy udders produce healthy milk for healthy people.
- Udder infections lead to extra labor and costs for treatments.

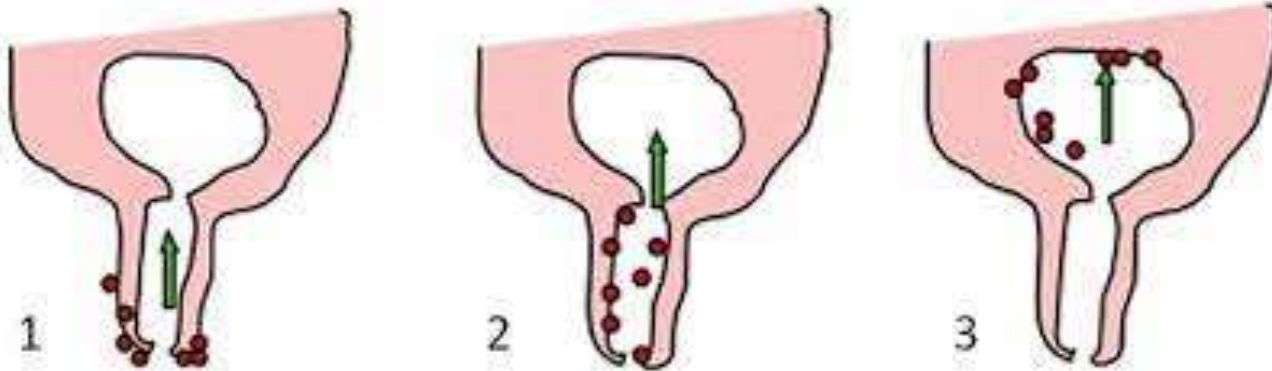
Mastitis is the main udder problem and a common disease on most dairy farms.

**Prevention of mastitis is the key!**



### 3. Background: Udder infection

- Mastitis is an udder infection caused by bacteria entering the teat canal.
- Mastitis means inflammation of the udder.
- The symptoms of an inflammation are:
  - Redness
  - Swelling
  - Warm
  - Pain



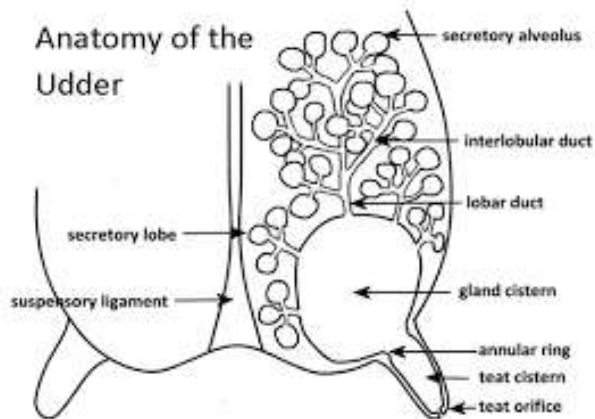
Bacteria entering the teat canal





## 4. A bacterial infection, what happens?

- Bacteria cause an inflammation.
- Due to the inflammation;
  - Blood flow changes (udder get red).
  - Cells die (udder get painful).
  - Drainage of liquids hamper (udder swells).
  - More activity in the udder (udder get warm).
- Blood in milk colors milk orange or red.
- Dead cells give clots in milk.
- When signs are visible you speak of clinical mastitis.
- When signs are not visible (yet) but by tests you find elevated numbers of cells in milk you call it sub-clinical mastitis.



Red, swollen, warm and painful udder

## 5. Signs of mastitis

### Clinical mastitis

- The first sign of clinical mastitis is often abnormal milk:
  - Milk will have clots.
  - The colour of milk can change.
  - Milk can become orange and watery.
  - Milk yield is going down.
- In some cases;
  - The udder swells.
  - The udder can become red and hard.
  - Touching the udder can become painful.
- In severe cases;
  - The cow can get generally ill and develops fever.
  - Food intake stops.
- In very severe cases;
  - The udder goes blue and tissue dies.
  - Cattle die.



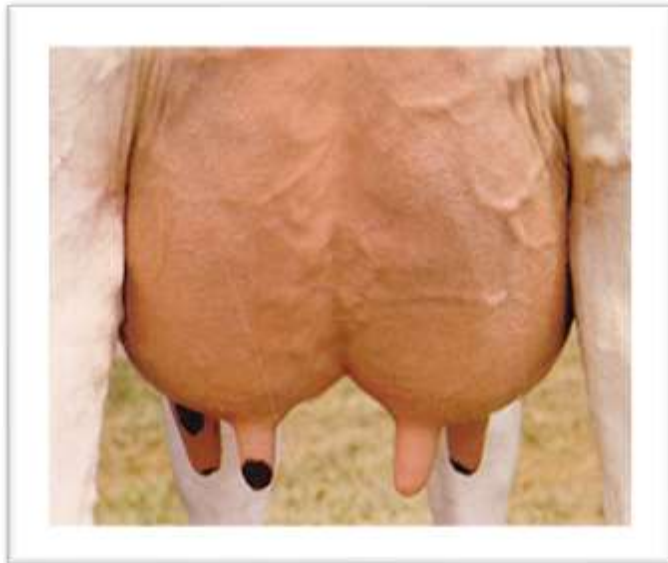
## 6. Type of mastitis

### Clinical mastitis

- Mastitis with clear symptoms like a red, swollen, warm and painful udder. Changed milk with clots and possibly fever is also manifested.

### Sub-clinical mastitis

- Mastitis with no clear signs. The cow is visibly healthy and the milk is visibly unchanged.



**Tip:** To detect sub-clinical mastitis, it is important to solve a mastitis problem at a farm.

Healthy udder



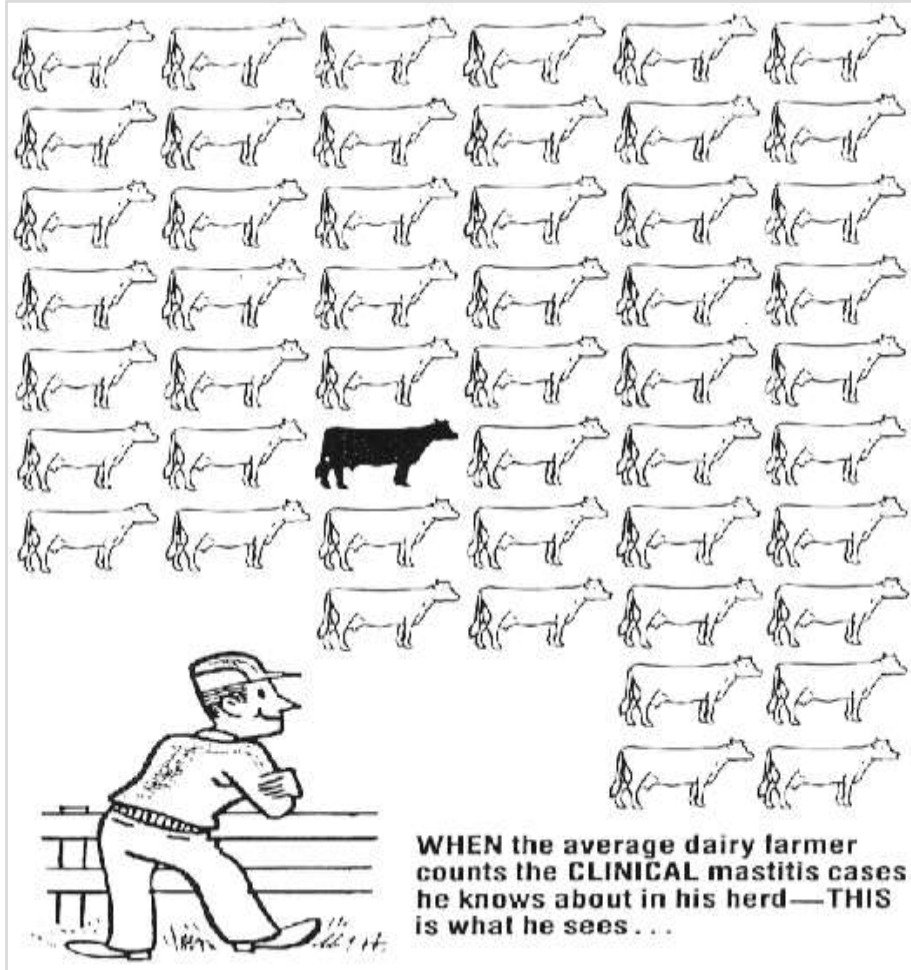
Three cattle with severe and very severe mastitis.





## 6.1 Clinical and Sub-clinical mastitis

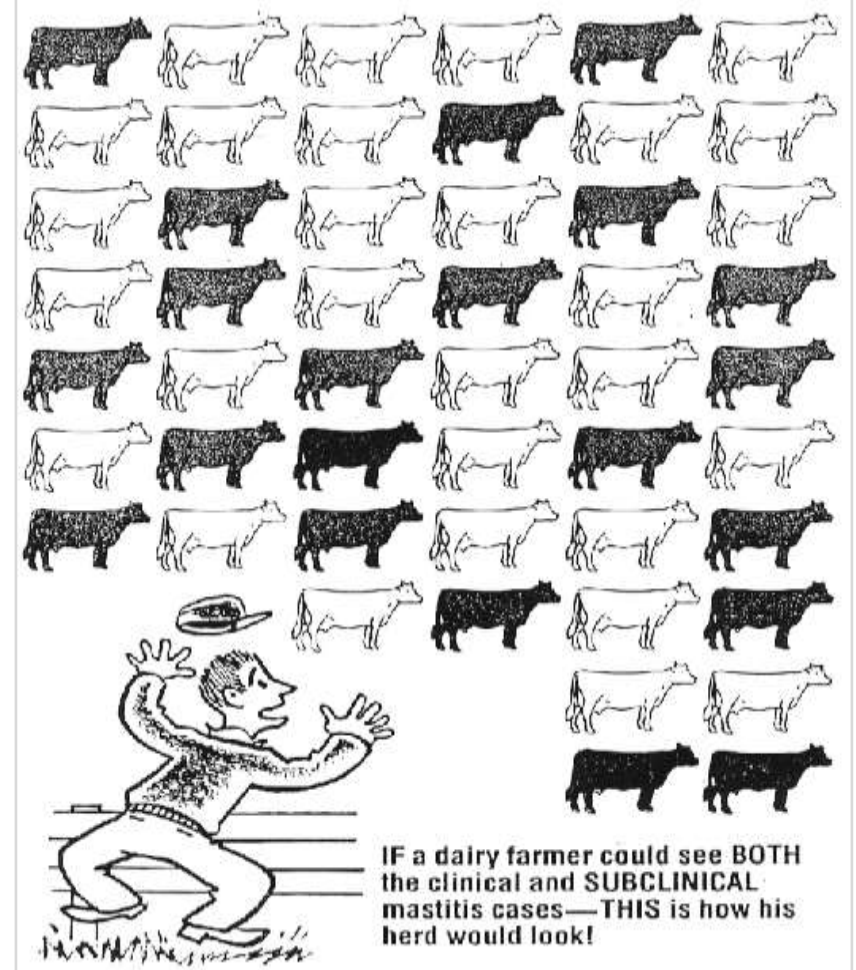
### Clinical mastitis



When only looking at clinical mastitis, problems can be underestimated.

In the same herd you can have problems with sub-clinical mastitis. Milk yield already drops and these cattle can develop mastitis later on.

### Sub-clinical mastitis

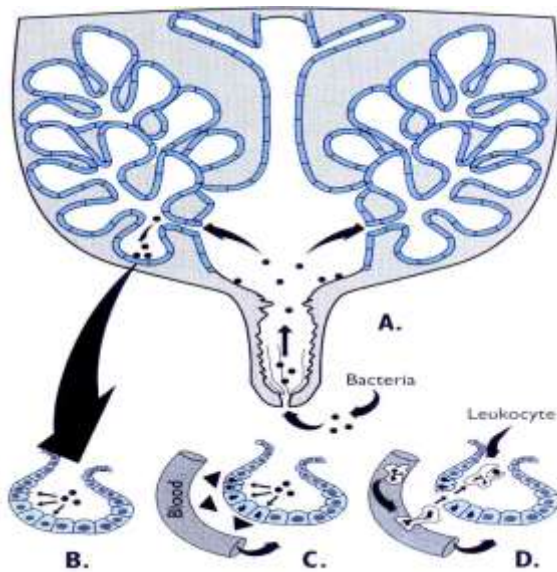




## 7. Sub-clinical mastitis and Somatic cell count

The main symptom of sub-clinical mastitis is an elevated somatic cell count (SCC). That is;

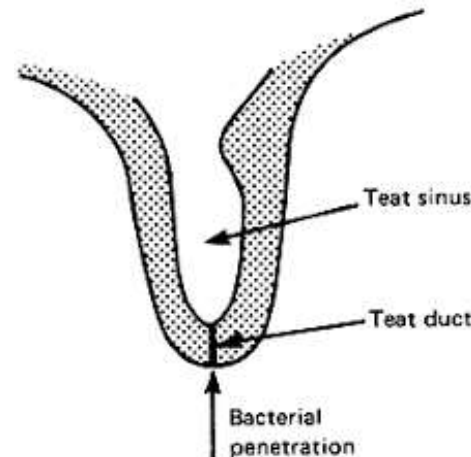
- The pathogen bacteria cause an infection.
- More udder cells die.
- These cells will come into the milk
- The milk can be tested on cell count by the **Californian Mastitis Test**.



Performing a CMT is of great help to improve udder health. The details are discussed in another PowerPoint presentation.

## 8. Prevention of mastitis

- All cases of mastitis are caused by bacteria.
- These bacteria enter the udder through the teat canal (not through the skin or by food or breathing).
- So prevention focuses on;
  - protecting the teat canal (milking technique) and
  - decreasing the number of bacteria around the teat canal (hygiene).



*Streptococcus agalactiae*



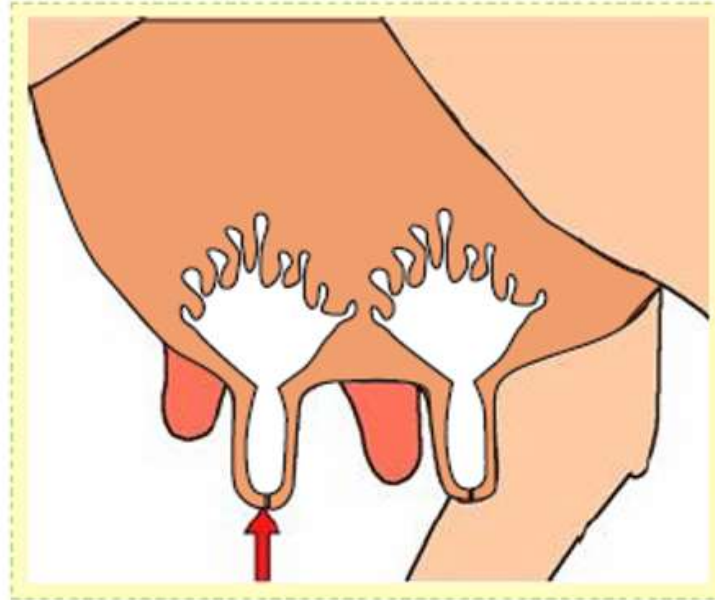
*Streptococcus agalactiae*, a bacteria causing mastitis.

- Inset: with huge magnification in electron microscope.
- Above: magnification of about 400 times the real size.

## 8.1 Background on prevention of mastitis



- The teat canal is open during milking and or suckling and for some minutes after it.
- This is the moment bacteria can enter the udder.
- So, special actions can be taken during and just after milking.



- A healthy teat canal is closed.
- Teat canals can be damaged, this increases the risk of developing mastitis.
- Two of the main reasons for damaged teat canal is a wrong milking technique or a malfunction milking machine.

To prevent mastitis:



Keep bacteria away from the teat end.

- Good hygiene & good milking technique are the key in preventing mastitis!





## 9. Bacteria

- Bacteria are small little (one celled) animals, which you can not see by the eye.
- Bacteria multiply very quickly under good circumstances such as;
  - i. Wet
  - ii. Warm
  - iii. Plenty of food (Milk)
- Bacteria live on:
  - the cow herself
  - other cows
  - the milker
  - milking equipment
  - the surrounding.



Bacteria die in a sunny, hot and dry environment.



## 9.1 Bacteria Cont'd...

- Bacteria are everywhere!
  - On the farmer
  - On the cow
  - On the floor
  - On milk equipment
  - On towels.



Dirt contains a lot of bacteria



Old and dirty milk can



Manure is full with bacteria



## 10. Tackling mastitis holistically

- The things to work on;
  - Cow environment
  - Milking procedure
  - Milk technique
  - Monitoring
  - Culling and breeding
- All these issues are strongly interacting. Messing up one item while doing all other satisfactory can still lead to big problems.





## 11. Cow environment

- The aim is to keep the area around the teat end as clean as possible to minimize the chance of bacteria entering the teat opening. So:
  - Udders should be kept clean by having clean places to lay down. Pasture is excellent.
  - Have a clean place where cattle are milked.

Keep the stable/barn clean



One can ask, why is this man milking on dirty soil while 5 metres further he can milk in clean grass?

## 11.1 Cow environment Cont'd...



Milking in the mud.  
The big reason for increase in mastitis cases during  
the rainy season.  
Milking in the pasture is an excellent alternative.



This milking parlour looks clean.  
The cattle are clean as well.  
But bacteria spread much easier in a wet environment  
than in a dry one.



## 12. Milking procedures

- We take a look at 10 steps.
  1. Check milk equipment.
  2. Clean milk place
  3. Take care of personal hygiene
  4. Clean teats and massage the udder
  5. Check the first milk
  6. Milk in the correct way
  7. Dip teats
  8. Keep cows standing after milking
  9. Filter the milk
  10. Clean milk equipment





### 13. Step 1: Check milking equipment

- Milk equipment is clean and dry.
- When buckets and churns are stored upside down water can run out.
- Milk towels have to be cleaned and dried daily.



## 14. Step 2: Clean milk place

Why?

- To reduce the number of bacteria.

How?

- Remove shit and feed remnants.



Try to avoid using water.  
You do not want to milk in  
a wet environment.





## 15. Step 3: Take care of personal hygiene

- Clean clothes and washed hands also contribute to prevention of mastitis.



Wash your hands properly.



Gum boots are easy to clean.



## 16. Step 4: Clean teats and massage the udder

- Clean the teats and massage the udder with a dry towel or piece of paper.
- Only use water when the udder is really dirty and make sure it is dry before milking.
- Do this at least for 30 seconds so the cow will let-down the milk.
- Start milking after 30 seconds or within 1 minute.



Wet drops containing bacteria will run to the teat end.



Cleanable udder towels.



Examples of disposable paper towels

## 17. Step 5: Check the first milk

- This is done to check if the milk is normal; and because the first milk contain the most bacteria, if present.
- Take 3 spades of milk and check on:
  - Color
  - Consistency
  - Clots or flakes



To avoid cross contamination do not put it on the ground, but do it in a cup.

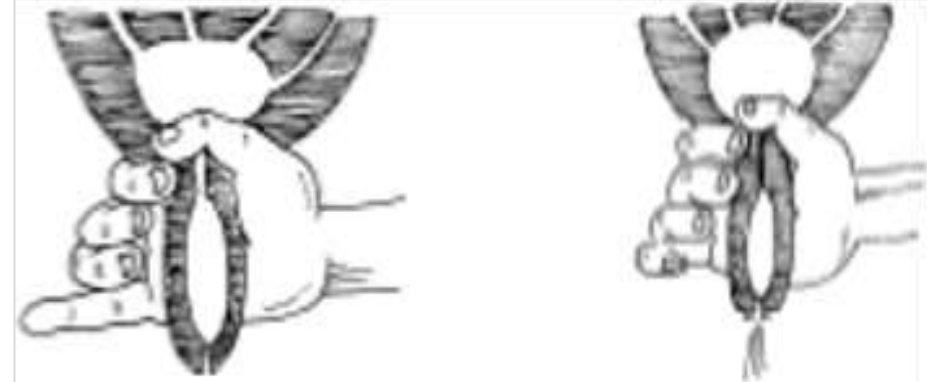
## 18. Step 6: Milk in the correct way

Good hand milk technique is crucial.

- When not doing it correctly the teat ends can be damaged.
- This increases the risk of mastitis.
- Field findings in the South West of Uganda indicate that a lot can be gained here.



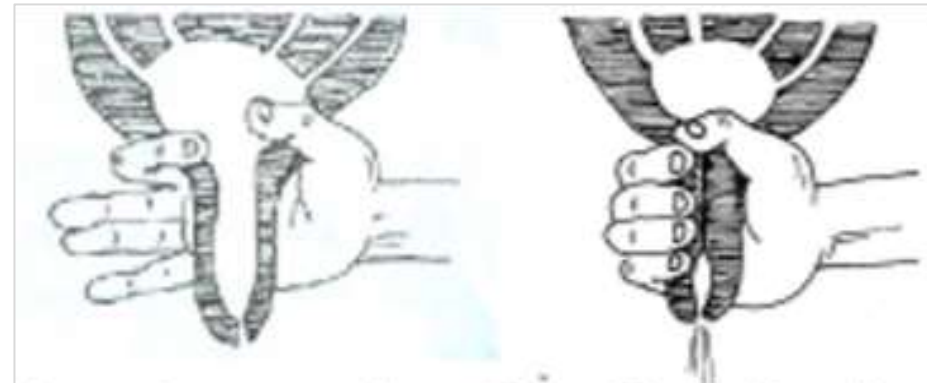
1. Grasp the teat with thumb and first finger



2. When closing the second and third finger milk will come out.



3. Close the little finger and squeeze the teat with the whole hand.



4. Then release the teat, it will fill with milk again. Then repeat steps 2, 3 and 4.



## 18.1 Stripping

One of the most common mistakes made in hand milking is called stripping.

- This can be painful for the cow.
- It increases the risk of damaging the teat openings.
- Remember there is no better milker than the calf.
- The milker should imitate her way of doing it.



Grasping the teat with thumb and first finger and then pulling them down is called stripping



Good



Bad

## 19. Step 7: Dip teats

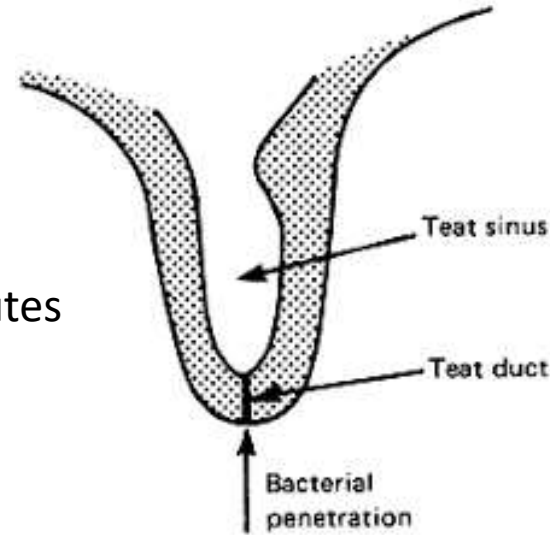
- After milking the teat hole stays open for another 30 minutes. During this time it is easy for bacteria to enter the teat canal and cause infection.
- Keep hygiene during and after milking optimal by;
  - Sanitizing teats before milking,
  - Using gloves during milking,
  - Spraying/dipping the teats thoroughly immediately after milking,
  - Let the cows stand after milking so that the teats dry and close.





## 20. Step 8: **Keep cows standing after milking**

- It takes a while after milking before the teat openings close firmly.
- During this time the cow is vulnerable to getting mastitis infection.
- By letting the cow stand for at least 20 minutes after milking, this risk will be reduced.
- A good way to do this is by offering the cow feed immediately after milking.





## 21. Step 9: **Filter the milk**

- Filtering the milk is primarily done to get unwanted substances out of the milk like straw and flies.
- But by filtering the milk it will also show possible clots in the milk if by accident mastitis milk is put into the can.
- When using a filter of cotton, linen or nylon, make sure that it is properly washed and dried after each milking/filtering.



## 22. Step 10: Clean milk equipment

- Bacteria are spread by dirty towels, buckets and churns.
- The first aim of cleaning is to remove dirt.
- By removing dirt you remove majority of the bacteria as well.
- There is a difference between cleaning and disinfection (killing bacteria).
- You disinfect the equipment by putting the equipment in the sun and by drying it.



### Cleaning protocol

- First remove most dirt mechanically
  - Rinse
  - Brush
- Clean & disinfect
  - Hot water
  - Disinfectant
  - Soap
- Rinse again
- Dry.



## 23. Treatment of mastitis

- The best treatment of mastitis is milking.
- Milk the cow as often as possible and milk her completely out.
- By milking you remove the dead tissues and bacteria.
- Also massage the udder, what stimulated the blood flow and milk.

Next to that;

- Antibiotic treatment will help.
- Use intra mammary tubes.

In severe cases (fever, not eating);

- Always check body temperature (should be below 39 degrees celcius).
- Call a vet.
- The vet can decide to give antibiotics by injection or anti inflammatory drugs.





## 23.1 Treatment of mastitis cont'd: Intra-mammary tubes

### i. Using intra-mammary tubes

- Clean the teats.
- Put on gloves.
- Milk affected quarter and disinfect the teat hole an the teat end (alcohol is a good disinfectant).
- Bring the short end of the injector in the teat hole and push the injector contents gently into the teat canal.
- Dip or spray the teats.



## 23.2 Treatment of mastitis cont'd: Dry-off

### ii. Dry-off treatment

- This is the treatment you do to prevent mastitis directly after calving.
- In order to reduce the use of antibiotics (to prevent antibiotic resistance) nowadays, it is only recommended for cattle with sub-clinical mastitis.
- So check before drying off the somatic cell count with a Californian mastitis test.



Cow dried off with teat sealer.



#### The dry period:

- It is general custom to dry-off a cow 8 weeks before calving.
- This gives the udder time to recover and to be prepared for the next lactation.
- It is a fairy tale that cattle need to be dried off to get pregnant.