

## Section 5

# Milk Quality Mastitis and SCC

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## Introduction

Mastitis and SCC (somatic cell count) reduce the yield and quality of milk from dairy cows. High levels of SCC can adversely affect the processability of milk.

- ① How do I calculate the true cost of mastitis and SCC?
- ② How can I manage an SCC/mastitis problem?
- ③ What maintenance should I carry out on the milking machine?
- ④ What is a good milking routine?
- ⑤ How should I manage drying off?
- ⑥ How should I manage freshly calved cows?
- ⑦ How do I identify and treat problem cows?
- ⑧ What is a good action plan when SCC is high or there is an increase in clinical mastitis?

# Mastitis & SCC

## ① How do I calculate the true cost of mastitis and SCC?

Milk SCC levels above 100,000 mean you are losing money. On average mastitis costs farmers €60/cow/year.

- 200,000 to 300,000 cells/ml indicates that approximately 30% of the herd are infected.
- 300,000 to 400,000 cells/ml indicates that approximately 40% of the herd are infected.

### How to

### Calculate the cost of mastitis and high SCC



#### Costs associated with mastitis

- Subclinical costs = milk quality penalties
- + loss in milk produced by cow
- Clinical costs = antibiotics
- + discarded milk + labour + veterinary attention
- + culling/mortality

Calculation of cost of mastitis (subclinical + clinical) in a 100 cow average dairy herd

#### Example

Cost of mastitis in dairy herd of average bulk milk SCC 400,000 cells/ml (274,000-546,000)

**versus** 100,000 cells/ml (69,000-136,000) with 100 cows (25% 1<sup>st</sup> lactation) (assuming potential milk yield of 3,874kg and 5,165kg for 1<sup>st</sup> lactation and older cows, respectively)

**Total cost due to subclinical mastitis = € 10,316**  
**Total cost of clinical mastitis = € 1,400**  
**Total cost of mastitis in the described 100 cow herd per lactation = € 11,716**  
**i.e. (€117/cow/year)**

In this example a herd with an SCC of 100,000 was €11,716 less profitable.

### Key terms

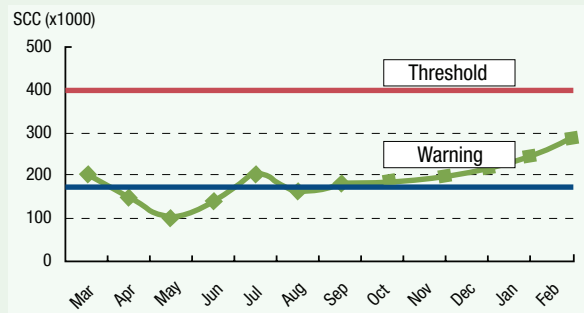


**Clinical mastitis infection** - changes in the udder and/or the milk are detected easily by the milker, i.e. clotting and discolouration of the milk, reddening, heat, pain, swelling and hardening of the udder.

**Subclinical mastitis infection** - the udder and milk appear normal and there are no visible signs of infection but the somatic cell level in the milk is raised.

#### Somatic cell count (SCC)

Subclinical infection in a herd is measured by somatic cells in milk. Cows free of mastitis and with no previous infections would probably have an SCC of less than 100,000 cells/ml.



Below the blue line, performance is good.

It is widely accepted that an individual cow SCC greater than 150,000 cells/ml or an individual heifer SCC greater than 120,000 cells/ml indicates infection in that animal.

### Key facts



- 100,000 to 200,000 cells/ml indicates that approximately 20% of the herd are infected.

## 2 How can I manage an SCC/mastitis problem?

The farmer needs to allocate TIME and ATTENTION to the problem. It is better if there is a group approach, i.e. the farmer, milk quality advisor, veterinarian and milking technician, so that all angles are covered.

### Consider the following factors:

**Malfunction of milking equipment:** For the average size dairy, milking equipment should be tested and serviced every 9–12 months, so this would be a good place to begin troubleshooting.

**Clean environment:** If over 5% of the cows are heavily soiled with manure on the rear legs and udder (especially on the teats), there is a problem with management. Ensure that approach roadways, milking parlour and cubicles are clean and properly maintained.

### Contagious mastitis and milking procedures:

The most common form of contagious mastitis is caused by *Staphylococcus aureus*. Almost all herds have some infected cows. The milking preparation procedures should be reviewed and compared to the ideal, and improvements and changes made where needed.

### Post-milking teat disinfection and dry cow therapy:

If these practices are not being used, they should be introduced. Teat disinfection reduces new infection rates by 50%. Dry cow therapy cures subclinical infection and prevents new infections at drying off.

### Dry period and calving management:

This is a critical time in the lactation cycle. These cows should be kept very clean, dry and comfortable, especially at calving.

## Key Point Checklist



- Correctly disinfect all teats of all cows after each milking.
- Treat all quarters of all cows with dry cow therapy at end of lactation.
- Have milking equipment checked and serviced at least once per year.

- Review milking practices and hygiene.
- Keep cow udders clean between milkings and maintain good teat condition.
- Remove clusters carefully.
- Cull chronic problem cows.
- Culture and identify the bacteria if there is a recurring herd problem.
- Clip tail hair regularly.

## 3 What maintenance should I carry out on the milking machine?

### Each day:

- Check the vacuum gauge (47-50 kPa for mid-level plants).
- Check to ensure claw air bleeds are free of dirt.
- Check rubberware for leaks and replace any worn or broken rubberware.

### Each week

- Check oil flow from the oil reservoir.

### Every eight weeks

- Remove filters at vacuum regulator and wash and dry.
- Flush each pair of long pulse tubes with warm water.

### Twice a year

- For spring calving herds, change liners twice a year or after 2,500 cow milkings, whichever comes first.
- Ensure that liners are compatible with shells.
- Change complete set of liners at the same time.
- Record exact dates of liner change in the farm diary.

### At least once a year

- Have the milking machine tested by a qualified technician.

## Mastitis & SCC

### ④ What is a good milking routine?

- Only attach teatcups when teats are clean and dry.
- Wash your hands before, and wear gloves during, milking.
- Inspect the foremilk for signs of clinical mastitis.
- 'Best practice' is to wash and dry cows before milking, in particular wash and dry cows when they are indoors or on out-wintering pads.
- Avoid splashes or sprays of milk onto hands or clusters.
- Use running water and disinfectant solution to remove infected milk from gloves, clusters or other surfaces.
- Standing areas and yards should not be washed down until the cows have departed.
- If possible, identify high SCC and clinical cows to milk them last in the herd. If this is not possible, sanitise the cluster before attaching it to the next cow.



### Checklist

#### Milking technique

- Attach clusters to cows in batches as soon as possible after preparation.
- Hold the inverted cluster level in your hand so that the vacuum is cut off from the cups and air leakage is minimized.



- Attach each teat cup in sequence and as quickly as possible.
- Remove clusters when milk flow ceases and shut off vacuum at the claw-piece before removing the cluster.
- Establish, and if necessary write down, a set of procedures so that each milker is absolutely consistent at every milking.

#### Post-milking teat disinfection

- Spray all teats of all cows as soon as possible after every milking (20ml per cow).
- Ensure that the entire circumference of the teat is covered - a drop of disinfectant should be seen at the end of the teat.
- Apply teat spray from directly underneath the tips of the teats.
- Check the 'far sides' of teats of some cows to ensure correct spraying.
- Have sufficient teat disinfection sprayers (e.g. one per four units).
- Ensure that teat disinfection sprayers are operating correctly.
- If using a teat disinfectant that is not 'ready to use', dilute daily.
- If using a dip cup, wash it daily or more frequently if contaminated.

#### Checklist

##### To achieve milking excellence

- Set performance goals - ultimate target <150,000 cells/ml.
- Rapidly identify mastitis problems.
- Milk clean cows.
- Standardise the milking routine.
- Train staff.
- Have treatment protocols.
- Maintain and update the milking system.
- Set time aside to manage milk SCC and mastitis incidence.

- Buy only healthy cows.
- Use dry cow therapy.

#### 5 How should I manage drying off?

- Cows at eight weeks or less to expected calving date should be dried off.
- Cows at more than eight weeks to expected calving date BUT with milk yield at 8-9kg or less /cow/day should be dried off.
- Cows at greater than eight weeks to expected calving date with milk yield greater than 8-9kg/cow/day BUT with milk SCC greater than 300,000 cells/ml should be dried off.

#### How to

##### Dry off an individual cow



- Treat all quarters of each individual cow with the same treatment.
- Administer dry cow antibiotic tubes after the final milking.
- Milk out the quarter fully before infusing the dry cow antibiotic/sealant.
- Disinfect the teat end with cotton wool soaked in methylated spirits.
- Avoid contamination of the nozzle of the antibiotic tube.
- Partially insert the antibiotic tube nozzle into the teat canal.
- Infuse the contents of the antibiotic tube into the quarter – gently massage the antibiotic upwards into the teat.
- Teat spray (post-milking teat disinfectant) treated quarters immediately after infusion.
- Teat sealer should be considered with dry cow therapy.





# Mastitis & SCC

## 6 How should I manage freshly calved cows?

At calving time a number of measures should be taken.

- Provide cows with a clean dry environment for calving.
- Check udders of all freshly calved cows for heat and pain; check milk from all quarters; milk and disinfect teats post milking.
- Withhold colostrum from the normal milk supply for a minimum of seven milkings.
- Ensure each cow has exceeded the dry cow treatment dry period before putting milk into the bulk tank.



- Infuse the contents of the antibiotic tube into the infected quarter and gently massage the antibiotic into the teat.
- Teat spray treated quarters immediately after infusion.
- Clearly mark the treated cow and treated quarter.
- Withhold milk from the normal milk supply until the end of the recommended withholding period stated on the label.
- Record treatment details on a chart at the parlour so that other milkers may check treatment details and milk discarding period.

### How to

#### Take udder quarter milk samples:

- Label a sterile bottle with date and cow identification and cow udder quarter.
- Disinfect the teat ends before sampling with cotton wool soaked in methylated spirits.
- If sampling more than one teat, then disinfect the teats furthest away first.
- Allow the teat to dry.
- Discard three strips of milk from the quarter in order to flush out any teat canal contaminants.
- Strip one to two good squirts of milk (5-10 ml) into the sterile bottle.

## 7 How do I identify and treat problem cows?

### How to

#### Detect mastitis

- Examine each quarter for changes in the milk (wateriness or clots) by examining foremilk before the milking cluster is applied.
- Examine the bulk milk SCC to determine the actual SCC level and the two to three day variation in that SCC.
- Examine the milk filter for clots after each milking.
- Examine each cow udder for heat, swelling or pain at each milking.

### How to

#### Treat clinical mastitis infection

- Milk out the quarter fully before infusing the antibiotic.
- Disinfect the teat end with cotton wool soaked in methylated spirits.
- Avoid contamination of the nozzle of the antibiotic tube.
- Partially insert the antibiotic tube nozzle into the teat canal.



## How to

### Carry out a CMT (California Mastitis Test)



- Discard the first squirt of foremilk.
- Squirt milk from each quarter into a different well on the CMT test tray (approximately 2 ml from each quarter).
- Mix each milk sample with an equal volume of reagent (available commercially).
- Swirl the mixture vigorously for maximum of 20 seconds and examine the degree of thickening/gelling in each sample (gelling may be more visible if the test tray is tilted).

### 8 What is a good action plan when SCC is high or there is an increase in clinical mastitis?

#### Action Plan when problem arises

The following protocol should be implemented until culture and sensitivity results and individual SCC reports are available.

1. All milkers should wear gloves.
2. Pre-spray and dry wipe all cows. Avoid washing, only wash dirty cows.
3. Dip all clusters in peracetic acid solution. 20 mls to 9 litres of water. Change solution after 12 clusters have been dipped in solution.
4. Post-spray all cows. Ensure 90 mls/cow/milking is applied.
5. Keep cows off cubicles for 30 minutes post-milking during the winter and cut off access to cubicles during the summer.
6. Get machine checked.

This programme prevents the spread of infection within the herd until the cause of the problem has been established. Seek advice as soon as possible.





