Hygiene in the milk parlour

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Long ago we believed that we could clean milk by pouring milk through a strainer. Today we know better, but do we as workers understand the difference between clean and bacteriologically clean? Do we realise that a tank that looks clean, is not really clean? A milk strainer cannot stop bacteria or antibiotics.

Bacteria

Bacteria are very small organisms that one cannot see. They make food such as milk, meat and fish go bad very quickly and cause off tastes in cheese (dairy products). Bacteria need the following to grow properly:

- **Heat (temperature):** bacteria love heat. That is why we have cold rooms, milk tanks and fridges.
- **Moisture:** Bacteria are found in dust, but need moisture to grow.
- **Food:** Milk, meat and fish are the ideal food. Bacteria in dirty milk tanks or milk machines have the heat, moisture and food they need to grow.

Cleaning

To effectively clean a milk tank and milk machine we need all three products:

- **Soap:** Soap helps to remove the food (fat/protein) for bacteria from the system.
- **Acid:** Acid is used to remove the lime that comes from the warm water for washing, from the equipment. The lime scale serves as a hiding place for milk remnants and bacteria. Acid also lowers the pH of the equipment and a low pH is bad for bacterial growth.
- **Sanitiser:** After the soap removed all the food and the acid all the lime, there can still be bacteria in the milk machine. It is necessary to sanitise the equipment to kill the remaining bacteria.

What does a good washing programme need?

Temperature: Fat and protein must be removed at a temperature of ±75ºC. If the water becomes cold, the fat and protein is left behind again. There is not such a thing as cold-water soap.

Concentration: The right amount of soap, acid and sanitiser must be used for the amount of water. Do not waste money by trying to save on the wrong things.

Time: Every milk machine must be washed for a different length of time. The time must not be shorter than 6 minutes and not longer than 10 minutes. The temperature of the water for washing will determine the time for washing. The temperature of the water for washing must never be lower than body temperature. The milk tank is washed with a cleaning agent that foams to determine the time. The time that the foam takes to run down the sides of the tank, gives the soap the chance to work.

Action: Action is achieved in the milk tank by using a tank brush. Action is achieved in the milk machine by letting in air at the suction pipe at the washbasin. The suction pipe must let in air for 3 seconds before the milk pump lets the water for washing run out in the washbasin. Longer than 3 seconds will cool down the water for washing too quickly.

Washing programme for the milk machine

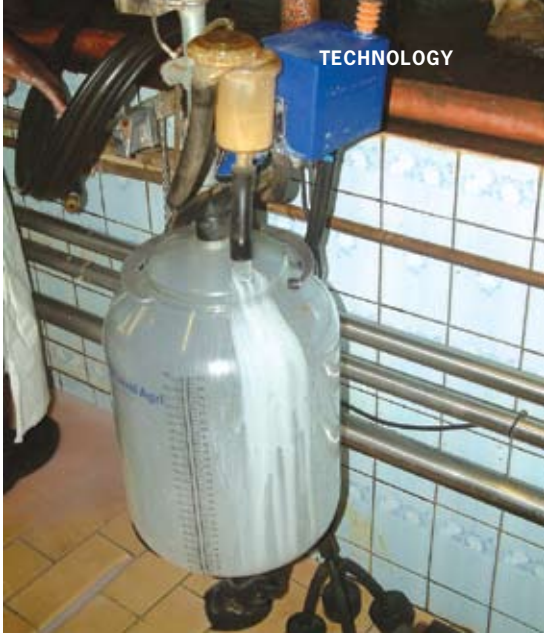
Step 1 Rinse the milk machine with cold water. Lukewarm water is very dangerous as lukewarm does not feel the same for everyone. Water that is too hot will result in protein forming a layer in the equipment.

Step 2 Wash the milk machine with warm (±75ºC) water and soap for between 6 and 10 minutes.

Step 3 Rinse the milk machine with sanitiser in cold water ±3 minutes.

Step 4 Drain all water for washing from the equipment.

Acid step Depending on the hardness (amount of lime) of the water, the milk machine must be



washed with an acid once or twice a week. It can be cold water for 10 minutes. The acid step is done after **Step 2** and before **Step 3**.

Washing programme for the milk tank

Step 1 Rinse the last milk out of the tank with cold running water (use a hose-pipe).

Step 2 Mix a solution of ±15 litres warm water (75ºC) and foaming soap in a plastic bucket. Place the bucket in the tank and wash the milk tank with a brush from top to bottom. Use a bucket because it helps to maintain the temperature of the water. Do not forget to wash the tank outlet and gauge/yardstick.

Step 3 Sanitise the milk tank by applying the sanitiser with a spray bottle or by washing the tank with a tank brush.

Step 4 Drain the sanitising water.

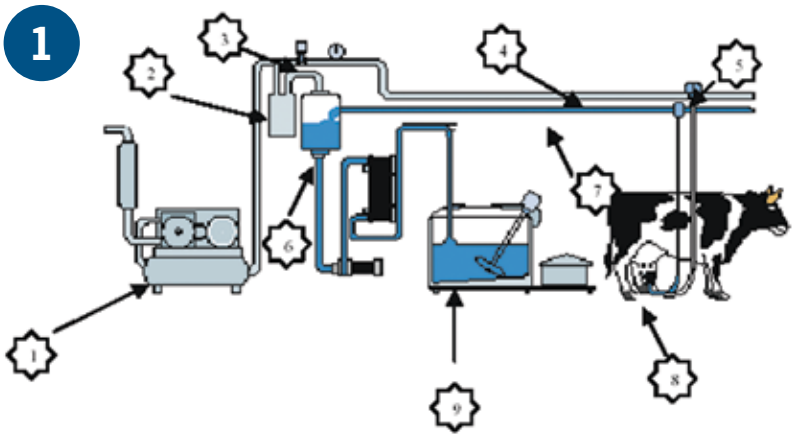
Acid step The milk tank must be washed with a strong acid once a week to remove lime scale. This step is done after **Step 2** and before **Step 3**. *DMA*

Important components of a milking machine

by Rykie Visser, export and district sales manager, DeLaval

In the previous edition of Dairy Mail Africa*, we discussed the importance of machine milking* versus *hand milking, and the benefits of machine milking. Now we will take a closer look at the major components of a typical milking machine. These components form an integral part of ensuring that we milk out our cows properly.*

The following diagram shows all the important parts of a milking machine:



Components

1. Vacuum pump

This can be seen as the "heart" of the milking machine, without it we cannot milk. It creates vacuum by sucking air out of the system (pipes, receiver, etc) to suck the milk out of the cow's udder.

2. Sanitary trap

This "trap" protects the vacuum pump from moisture and dirt that might be sucked up through the vacuum lines by accident.

3. Vacuum regulation

This can be seen as the "brain" of the milking machine, and controls the vacuum level in the system, by letting in extra air when the vacuum level rises too high and closing when the vacuum level drops too low. It can be very harmful to the cow if the vacuum level rises too high, and the teats of the cow can be damaged.

4. Vacuum line

This line transports the vacuum to the pulsators.

5. Pulsator

This important device simulates the suckling of the cow, and stimulates the cow to let down the milk to be sucked out by the vacuum. It also massages the teats of the cow.

A typical pulsator

6. Receiver

Because the milking machine works under vacuum, and we pump the milk to a cooling tank, we have to use a

A typical receiver

Typical bucket milking

receiver to collect all the milk during the milking process, and then pump it to the cooling tank for refrigeration.

7. Milk line
This line transports the vacuum to the cluster and then transports milk from the cluster to the receiver.

8. Cluster
The cluster consists of the rubber liners that fit tightly around the teats to extract the milk and a collection bowl where the milk is collected from the four teats.

This picture shows a cluster on the cow's teats busy milking the cow

9. Cooling tank
The job of the cooling tank is to cool down the milk as fast as possible, preferable to about 4°C within 3 hours after milking. It is important that we cool down the milk to 4 °C as fast as possible to prevent bacteria growth. If we do not cool it down quickly enough, it will become sour.

The cooling tank

Remember, we can either milk the cow with a bucket, or with a trolley milking machine, or with a direct in line machine as described above.

In the next edition we will have a look at simple layouts for milking sheds and calf housing – do not miss it!

Please feel free to contact the author should you need more information on machine milking. E-mail rykie.visser@delaval.com *DMA*

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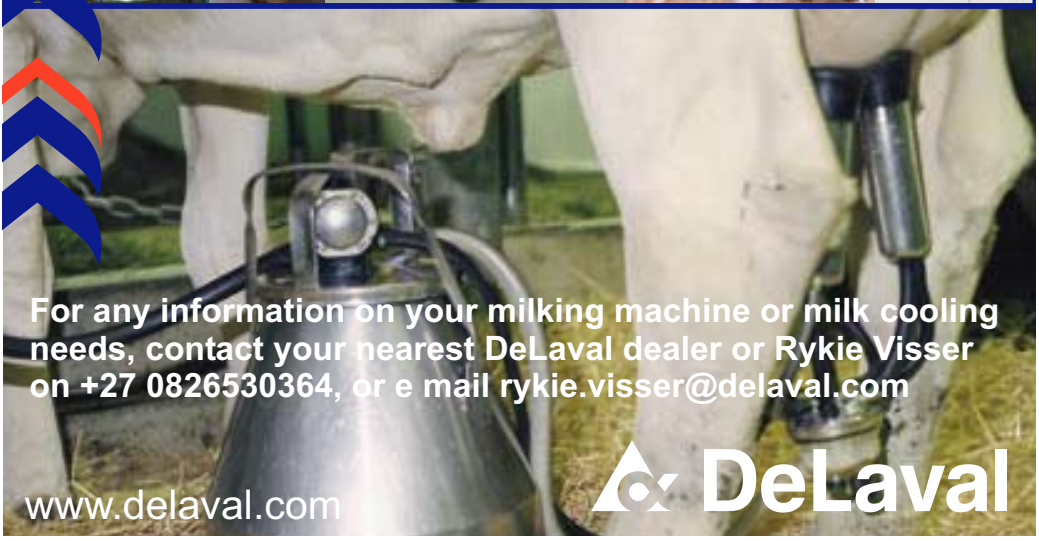

For any information on your milking machine or milk cooling needs, contact your nearest DeLaval dealer or Rykie Visser on +27 0826530364, or e mail rykie.visser@delaval.com

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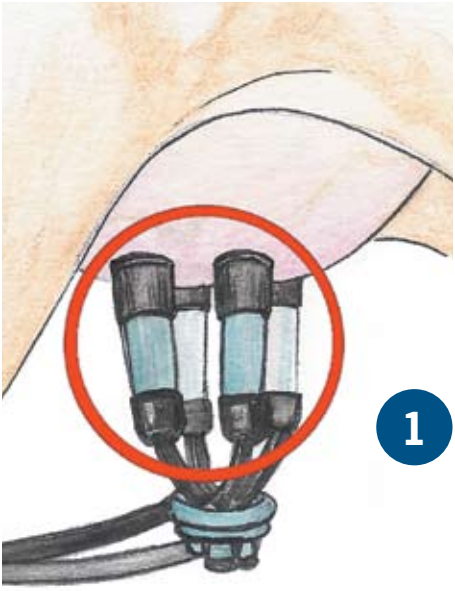
Milk out your cow properly

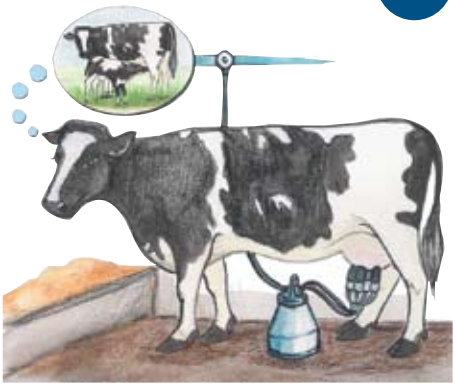
The rubber liners of the **cluster** must fit tightly around each teat of the cow.



1

The **pulsator** simulates the suckling of the cow and massages the teats. The cow lets down the milk to be sucked out by the vacuum.

2



A **vacuum pump** sucks air out of the system. Watch out that the vacuum level does not rise too high, because the teats of the cow might get damaged!

3

The **cooling tank** cools down the milk to 4°C within 3 hours after milking to prevent it from becoming sour. *DMA*

4

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More recently, Tetra Pak has undertaken to develop school feeding programmes based on non-dairy liquid foods. This is done by using grain commodities, such as soybeans, wheat and maize that is delivered in a ready-to-drink format. The foundation of these programmes are built on working partnerships that create integrated agricultural, food processing, packaging and distribution initiatives, as well as complete cow-to-consumer delivery systems. The projects also aim to become a catalyst for extensive economic growth

The value chain

The cow-to-consumer model that is also applicable to other commodities, serves as the basis for public/private partnership solutions in agricultural development and feeding schemes. By combining training and education for farmers, equipment financing, consumer education activities and by addressing all links in the value chain, a foundation for sustainable economic development is established.

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