The milk **cooling tank**

Like all other parts of a milking plant, milk cooling tanks have to be cleaned. This should be performed immediately after it has been emptied. Small tanks are usually cleaned manually. Larger tanks are often cleaned by means of automatic cleaning units, since it is difficult to reach all the surfaces manually.

Automatic cleaning units clean the cooling tank by spraying. The cleaning solution is pumped through one or two spreaders, which direct it as spray towards the surfaces to be cleaned.

Principally, the cleaning of the milk cooling tank is divided into the same phases used for the circulation cleaning of the rest of the milking plant: a lukewarm pre-rinse is followed by a circulation cleaning with hot water and a final cold rinse.

Due to the large cold surfaces of the cooling tank, it is often difficult to maintain the proper temperature of the circulation water. Therefore, it is essential that the starting temperature of the circulation phase water is as high as possible.

What is cleaning?

The purpose of cleaning the milking equipment is to achieve microbial control. Cleaning includes both the removal of any unwanted material left after milking and the killing of micro organisms, usually called disinfection. Cleaning should always be performed as soon as possible after each milking.

After milking, the milking equipment is soiled with residues of liquid milk and air dried films of milk. The main part of this old milk (often called soil) is easily removed by rinsing with water. However, the last part is often harder to get rid of. Therefore, the most difficult task of the cleaning system is to remove this last soil.

The milk residues consist of, among other things, fats and proteins, which are delicate substrate and protection for bacteria. Of course, the milk also contains bacteria, which will multiply at a high rate if not removed. In the battle against bacteria, the removal of the milk residues is a good start, since these residues are the main locations for bacteria.

Although most of the residues are removed, bacteria can still attach to visibly clean surfaces. Under favourable conditions they can also form a bio-film, which can be very hard to remove. Therefore, it is of utmost importance to prevent the formation of this bio-film.

What factors are involved in cleaning?

Cleaning is basically the process that removes soil from the equipment that is to be cleaned. In order to make this process as efficient as possible, four important factors are combined. These are:

1. mechanical force,
2. cleaning agents,
3. heat, and
4. contact time.

Water is of course the key to get these factors to work towards a satisfying cleaning result.

1. Mechanical force

Soil that has firmly adhered to surfaces in the milking plant needs to be exposed to a mechanical force in order to be loosened. This force is usually exerted by circulating water in the plant, but could also take place through scrubbing or spraying. Both the milking plant and the cooling tank can be cleaned with one or both of these methods.

2. Cleaning agents

Cleaning agents could be divided into detergents and disinfectants. Often, however, the cleaning agents consist of both. Detergents assist in removing the soil by helping to loosen it and to hold it in suspension so that it can be removed during rinsing. Another important task for detergents is to prevent issues like calcium and magnesium forming milkstone.

Detergents can be either alkaline or acid. Often an alkaline detergent is used as the main detergent. Acid detergents are then used, for example once a week, in order to remove milkstone.

Disinfectants are used to kill microbes. Often disinfectants consist of chlorine or chlorine compounds. In some alternative cleaning systems, disinfectants are replaced by the use of heat.

3. Heat

The role of heat is to improve the ability of dissolving and emulsifying different materials. Detergents are more easily dissolved when the water is warm. It is also important that warm water is used in the removal of fatty materials.

4. Contact time

Contact time means that the water, heat and cleaning agents must have sufficient time to perform the cleaning. The time needed varies depending on the cleaning method.

Water

As mentioned before, water is important for the cleaning result for several reasons. It carries cleaning agents and heat, and exerts mechanical action on the surfaces to be cleaned. The transportation of soil is another important task for water, since the soil is the main hiding place of micro-organisms. With the help of cleaning agents, heat and turbulent water, the soil is suspended or dissolved, which makes it easy to remove. This removal is an important step towards the successful cleaning of the milking plant.

Although it is a key tool in the cleaning process, water can also contain a wide variety of impurities that could jeopardise the cleaning result. Important types of elements that may be regarded as impurities are calcium, magnesium and other ions that make the water hard.

Assessment of surface cleanliness

If the cleaning is unsuccessful, soil could be visible at different points in the milking plant. A manual inspection is therefore always an appropriate way of discovering a possible malfunction. Table 1 describes some kinds of deposits that could occur.

Table 1: Types of deposits soiling the cooling tank

Kind of deposit	Description
Fat	Greasy, oily appearance of surface
Protein	Varnish-like, blue-rainbow hue
Milkstone	White to yellow deposits
Iron	Red to brown or black
Bacteria	Red or pink/purple colouring or staining
Rubber fragments	Black or blackening residues

Cleaning the milk cooling tank

Cleaning removes soil (milk residues and bacteria) from the equipment. Clean the cooling tank immediately after it has been emptied.
Important: Always use clean water.

Small tanks: clean by hand.
Larger tanks: automatic-cleaning units (spraying of cleaning solution).

Factors involved in cleaning:

1. **Mechanical forces:** circulate water, scrub or spray.
2. **Cleaning agents:** disinfectants and detergents.
3. **Heat:** dissolves soil and removes fatty materials.
4. **Contact time**

Skoonmaak van die melkkoeltenk

Vuilheid (melkreste en bakterieë) word van die toerusting verwyder. Maak die koeltenk dadelik nadat dit leeggemaak is, skoon.
Belangrik: Gebruik altyd skoon water.

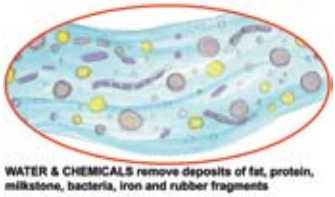
Klein tenks: maak met die hand skoon.
Groter tenks: gebruik outomatiese skoonmaakeenhede (spuit van skoonmaakmiddel).

Aspekte van skoonmaak:

1. **Meganiese aspekte:** sirkuleer water, skrop of spuit.
2. **Skoonmaakmiddels:** ontsmetmiddels en seep.
3. **Hitte:** los vuilheid op en verwyder vetterigheid.
4. **Kontaktyd**

Ukuhlanza ithangi lokupholisa ubisi

Ukuhlanza kususa ukungcola (izinsalela zobisi namagciwane) ethangini. Hlanza ithangi lokupholisa ngokushesha ngemva kokuba selithululiwe.
Okubalulekile: Njalo sebenzisa amanzi ahlanzekile.



Amathangi amancane: wahlanze ngesandla.
Amathangi amakhulu: imishini yokuhlanza ezenzelayo (ukufafaza ngomuthi wokuhlanza).

Izici ezihilelekile ekuhlanzeni:

1. **Amandla asetshenziswayo:** hambisa amanzi, hlikihla noma ufafaze.
2. **Izinto zokuhlanza:** izibulala-magciwane nezinto zokucoca .
3. **Ukushisa:** Kususa inhlabathi nezinto ezinamafutha.
4. **Isikhathi sokuthintana**

Ukucoca itanki lokupholisa ubisi

Ukucoca kususa ubumdaka (iintsalela zobisi nebhaktheriya) kwisixhobo. Coca itanki lokupholisa kwangoko emva kokuba likhutshwe yonke into ibiphakathi langabina nto.
Okubalulekileyo: Yiba soloko usebenzisa amanzi acocekileyo.

Amatanki amancinci: wacoce ngesandla.
Amatanki amakhulu: izinto zokucoca ezizicocelayo (ukuspreya umxube wokucoca).

Izinto ezibandakanyekayo ekucoceni:

1. **Izinto zomtshini:** icirculate water, iskrabh okanye ispreyi.
2. **Izinto zokucoca:** Izibulala-ntsholongwane nezicocisi.
3. **Ubushushu:** bunyibilikisa ukungcola kwaye bususa amafutha.
4. **Ixesha lokudibana**

Ho hlwekisa tanka e phodisang lebese

Ho hlwekisa ho tlosa mobu (masalla a lebese le baktheria) sesebedisweng. Hlwekisa tanka ya ho phodisa ka potlako ka mora ho ba ho ntshwe tsohle ka hara yona.
Sa bohlokwa: Ka mehla sebedisa metsi a hlwekileng.

Ditanka tse nyenyane: hlwekisa ka letsoho.

Ditanka tse kgolo: diyuniti tse hlwekiswang ka mokgwa wa othomatiki (ho nyanyatsa motswako wa ho hlwekisa).

Dintlha tse amehang tlhwekisong:

1. **Matla a mekhenikale:** potolosa metsi, kgohla kapa nyanyatsa.
2. **Disebediswa tsa ho hlwekisa:** dibolaya-dikokwanyana le disweufatsi.
3. **Motjheso:** qhibidihisa mobu mme ho tlosa methiriele o mafura.
4. **Nako ya ho iteanya** UM