



PHOTO: CHRISTINA EDSTRAND

## Accidents in agriculture

# SAFETY CONSIDERATIONS WHEN WORKING WITH MILK COOLING TANKS

A farmer was found dead in a milk cooling tank. The CIP-unit was started by the driver after the morning milk collection in accordance with a standing agreement.

After the tank was emptied the farmer must have entered the tank, probably to inspect the interior of the tank, as there had been recent problems of high bacterial counts.

While the farmer was in the tank the wash programme must have started. It is believed that the washing process prevented the farmer from exiting the tank. Later in the morning the farmer was found dead.

This type of tragic accident can be avoided.

### COOLING TANK WORK RISKS

- Toxic fumes when cleaning process is initiated
- Hot rinsing water
- Solitary work – no one knows that someone is working in the tank and there is no one to help in case of emergencies
- Fall through manhole
- Fall inside slippery tank
- Agitator starts
- Difficult access and problems getting out of the tank
- Oxygen deficiency in large tanks with high bacterial count
- Risk of drowning.

### SWITCH OFF THE MAIN POWER SWITCH DURING SERVICING

When the milk cooling tank needs servicing the main switch on the control box must be switched off and locked with a padlock. It is easy to guard against accidental start by placing the key in your pocket so no one else can start the cleaning process and the agitator during the servicing. This applies both when anyone enters into the tank, and when inspecting the tank through the main hatch, from above.

### GOOD AGAINST BACTERIA, BUT DANGEROUS FOR PEOPLE

A 5-step wash program was used in the milk cooling tank and was started by the Arla driver after milk collection, in accordance with the standard procedures.



Main switch with warning sign.

1. Pre-wash with clean water (about 40°C). Pre-wash with clean, hot water (about 85°C)
2. Main wash with added alkaline product
3. Intermediate rinse with clean water (about 85°C)
4. Disinfection (e.g. acid)
5. Final rinse with clean, cold water.

It is IMPORTANT that all 5 stages are respected – not only from a hygienic point of view but also from a working environment point of view. A failure to comply with the rinsing in step 3 can result in chlorine (if chlorine is used) mixing with acid which will produce a toxic steam Cl<sub>2</sub>. The gas will affect the respiratory system with a shortness of breath and could, at worst, result in fluid in the lungs.

In the Safety Booklet, section 8, the respirators and filters to be used are described, depending on the type of chemicals that are used to clean the tank. Your supplier can provide proper protective equipment. The gas-filter does not protect against oxygen deficiency. A respiratory protection system that supplies fresh air must be used when the oxygen alarm has been activated.

**NO ACCESS TO THE TANK IS ALLOWED WITHOUT A PROTECTIVE RESPIRATORY SYSTEM AND SUPERVISION**

- No one enters the tank before the wash programme is completely finished
- The tank is aired thoroughly – with a fan blowing fresh air into the tank (Not sufficient with just an open man-hatch)
- The oxygen content must be measured and oxygen measuring equipment must be carried by the person performing the servicing
- Respirator with the proper gas-filter must be worn
- When there is an oxygen deficiency a respiratory protection system supplying fresh air must be used
- Equipment to assist exiting the tank must be available, e.g. a ladder
- Supervision! There must be an assistant available at the tank side who can call for further assistance, and assist the person to exit the tank in the case of emergency. The assistant must have been instructed on what to do in the case of an emergency
- It may be necessary to install a safety line.

As far as possible inspect the tank from outside. The open man-hatch can be covered temporarily with a sheet of plexi-glass if it is necessary to inspect the interior of the tank while the sprinkler system is in function. A torchlight can be used through the plexi-glass providing protection from water and chemicals. Always wear goggles and gloves as drops of water and chemicals may remain on the man-hatch or the plexi-glass plate.


**FOCUS ON SAFETY**

- The employer is responsible for instructing the employees. It is always important with detailed instruction - also when work has to be carried out on milk cooling tanks
- Read and follow the instructions provided
- Plan the safe inspection of milk tanks
- When the working place risk assessment is updated – REMEMBER to focus on work in containers such as milk cooling tanks, silos, etc.

**SIGNS**

- Ensure that, in areas of risk, simple warning signs are located
- The signs are reviewed together with staff
- Ensure that the signs are visible and in good condition, so that any text can easily be read.

**Milk cooling tank** – place the indicated sign near the manhole:



### Attention

With internal inspection and servicing of the tank


- Have a trained assistant available
- Disconnect and lock the main switch in the control box
- Use protective equipment
- Before the man-hatch closed - check that no persons are in the tank




Switch off and lock the main switch on the control box



Protective gloves must be used



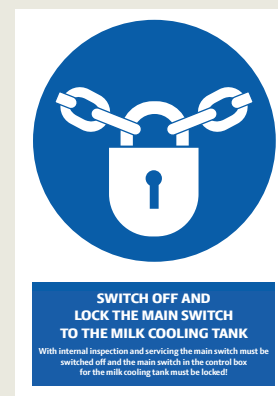
Protective goggles must be used



Protective respiratory system must be used



**Compressor**  
 Be aware that the surface can be hot (place the indicated sign on the compressor) and possibly be very noisy – therefore protect your hearing.



**Main switch**  
 Place the indicated sign on the main switch.

**USEFULL LINKS**

[www.landbrugogsikkerhed.dk](http://www.landbrugogsikkerhed.dk)    [www.facebook.com/agrisafety](https://www.facebook.com/agrisafety)  
 BAR Jord til Bord: [Fakta om sikkerhed under arbejde i mælketanke](#)  
 To buy safety signs: [www.josafety.dk](http://www.josafety.dk)