

Avoiding residue risks when cleaning milking machines and bulk milk vats

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Users of dairy chemicals are reminded to carefully manage the risks of residues entering the milk supply, especially if sudden milk quality problems require changes to their usual plant cleaning routines.

A range of dairy detergents and sanitiser chemicals are registered and approved for use to clean milking equipment. Dairy farmers use these chemicals to clean and sanitise milk-contact surfaces after each milking to ensure their milking plant is hygienic – a critical step in ensuring the safety and quality of the raw milk they supply.

Using chemicals in plant washing does however carry risks. Traces of chemicals left on milk contact surfaces may enter the milk supply leading to food safety and/or trade risks. Whilst the bacterial quality of milk must never be compromised, careful attention must be paid to minimising the potential for chemical residues to inadvertently enter the raw milk supply when cleaning and sanitising the milking plant.

Recently some of the chemicals that are widely used for cleaning and sanitising milking equipment around the world have come under scrutiny from regulators and consumer groups. These chemicals are considered essential to milking plant hygiene, so rather than removing them from wash programs altogether, farmers will need to carefully manage their use to ensure the milk they produce meets regulatory and customer residue limits. Examples of these include chlorine-based sanitisers including hypochlorite, chlorinated alkali detergents, iodine-based sanitisers, and some surfactants (wetting agents) included as minor constituents in many different dairy chemical products.

Fortunately, residues of these chemicals are rarely an issue if recommended cleaning programs are followed, and they are effectively cleaning the milking plant. When an effective cleaning program is being implemented the need for routine 'bomb cleaning' or extra 'hypo' to control 'bacto' counts is avoided.

Residue issues associated with dairy cleaning chemicals usually arise when additional chemical is used to tackle high bacterial counts resulting from a breakdown in the effectiveness of the usual cleaning program and/or a subsequent rinse cycle is not used.

If your current cleaning program is not delivering the results you expect, follow these steps to fix it, rather than relying on additional chemicals to tackle microbiological quality issues when they arise. The result will be more consistent milk quality and a lower potential for dairy chemical residues to find their way into your milk.



1 Check water quality – hardness and iron content

Water hardness impacts the effectiveness of alkaline detergents. Some alkali detergents cannot be used in hard water. The presence of iron also has a detrimental effect: the higher the level of iron, the higher the alkali dose rate must be. The hardness and iron content of the water will also influence the relative frequency of alkali and acid wash cycles in the wash program. Hence water hardness must be the first consideration.

Specialist dairy chemical sellers/distributors can test water supplies for hardness level and iron content. Dairy hygiene specialists should be capable of interpreting the results and provide advice on suitable detergents and sanitisers.

2 Check water availability – cold and hot

The volume of water available will affect the number of cycles that can be performed at each wash, and the availability of hot water will affect the temperatures of each cycle.

Generally, hot water availability is the limiting consideration (due to the capacity of the hot water service/s relative to the number of milking units), though during times of drought, access to 'cold' water of suitable quality may place additional constraints on the selected wash program.

Have a thermometer handy to confirm the temperature of water being delivered from each hot water service. Do not rely solely on the unit's temperature gauge.

3 Chemical product choice

Selection of what products to use is made easier once the quality and quantity of the water available has been determined. When choosing the most appropriate dairy chemicals, the following requirements should be part of the wash program decision-making process.

a Only use registered products

All detergents and sanitisers supplied and used for cleaning milking machines and/or bulk milk tanks must be registered by the Australian Pesticides and Veterinary Medicines Authority (APVMA). All APVMA registered products will have an APVMA approval number on the label. The APVMA status of a product can be checked by searching the APVMA database (portal.apvma.gov.au).

It is a food safety requirement that chemical products used in dairy cleaning programs must be APVMA registered and specifically approved (labelled) for this use.

b Follow the label directions

The way each product is used in the wash program must be consistent with the directions given on the label. This is particularly important when establishing dose rates and use temperatures. Using chemicals at dose rates and temperatures at higher or lower than that specified on the label directions can often compromise product performance, resulting in poor

outcomes. Not only is this seen as an "off-label" use, but it might also create an increased health and safety risk.

Nearly all detergents and sanitisers registered by the APVMA require a subsequent rinse cycle, either immediately after their use (for detergents) or prior to the next milking (for some sanitisers). Potable quality water (or the cleanest water available) should be used for the subsequent rinse cycle. This will minimise chemical residue risks, particularly when a rinse cycle is the last cycle of the wash program. There are a few sanitisers that do not require rinsing after their use. Always check the label directions for rinsing instructions.

c Handle and store with care

Always employ safe working protocols when handling, using, and storing dairy detergents and sanitisers. Safety directions are given on label.

Liquid alkali detergents and sanitisers that contain chlorine require additional care. The effectiveness of chlorinated alkali detergents and sanitisers diminishes with age. Furthermore, an undesirable chemical compound called chlorate develops as these products age. Using aged, chlorinated detergents and sanitisers will increase the risk of unwanted chlorate residues entering the milk supply. When selecting a liquid detergent or sanitiser that contains chlorine, select a pack size that will ensure the product is used quickly, preferably within six months. Store it in a cool, dry, dark, and safe place to slow the aging process.

4 Ensure good drainage

The risk of residues contaminating milk is avoided when all milk contact surfaces are left clean and dry for the next milking. The milking machine and the bulk milk tank should also be capable of draining freely and completely after every cycle of the wash program. The milking plant should also dry completely between milkings. If this doesn't occur the remnant cleaning solution may enter the vat at the next milking, potentially contributing chemical residues and bacteria into the milk supply.

5 Provide training

An effective wash program works well when all staff involved in cleaning follow the same routine. Provide hands on training for staff on the correct routine for cleaning the milking machine and the bulk milk vat. The wash routine is similar, regardless of whether the wash program is fully automatic or a completely manual affair. Be sure staff can demonstrate an understanding of the following key elements of the wash routine:

- The number of cycles in each wash program.
- The volume and temperature of each cycle.
- Which cycles, if any, are recirculated.
- The cycle in which each chemical is used, and its dose rate.
- The actions required to ensure the plant is drained between cycles and dried after the last cycle.

6 Have good documentation

An up-to-date cleaning program must be included in your farm's dairy food safety manual. This serves as an excellent reference when there are questions. Detailing the steps on a large wall chart that is highly visible, easy to read and close to the plant cleaning area will provide further guidance to staff.

7 Seek assistance

Formulating a cleaning program requires good knowledge about the science of cleaning. It also requires an understanding of the specific farm equipment and prevailing conditions. Consult a dairy hygiene specialist to help develop an effective cleaning program taking into consideration the risks chemical residues pose to the raw milk you supply.

FOR FURTHER INFORMATION

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