DAIRYSAFE
Leaders in dairy food safety

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Milk cooling

DAIRYSAFE has an obligation to actively promote food safety learnings that are important to your business.

Key points –

- Milk cooling, milk collection & milk storage specifications
- Why is milk cooling important?
- Enhancing milk safety & quality at the dairy
- Managing the milk cooling rate within your food safety program

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Maintaining the correct milk cooling rate and calibrating thermometers and gauges featured prominently in non-compliances identified during dairy farm audits in 2019. This Bulletin provides information on the background, requirements and management of milk cooling.

Milk cooling, milk collection & milk storage specifications

The Food Standards Code Standard 4.2.4 requires milk to be cooled and stored at temperatures that prevent or minimise the growth of microbial hazards.

The cooling of milk to 5°C or less within 3.5 hours from the start of milking is a long-held industry standard for minimising the growth of any bacteria that may be present. The Food Standards Australia New Zealand (FSANZ) guidelines for raw milk collection also specify these parameters and state the milk should be kept at or below this temperature until collected. No further risk assessment or validation is necessary with this time and temperature arrangement. However, every dairy must monitor and record milk cooling time and temperature at the frequency specified in your Food Safety Program.

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The FSANZ guidelines also allow milk processors to collect milk at temperatures other than 5ºC (depending on the time from milking) provided the milk processor undertakes a validated risk assessment of the milk and processes it accordingly to ensure its safety and suitability.

If milk is collected above 5˚C (for example, if the tanker arrives before chilling is complete) it is the milk processor's responsibility to ensure that cooling times and temperatures are compliant and demonstrate equivalent control of food safety risks. Approval of the validated temperature/time parameters is required prior to milk being collected under these arrangements.

Why is milk cooling important?

The milk cooling rate is the critical factor in controlling the risk of harmful bacteria, known as pathogens, growing. It also controls spoilage bacteria known as Pseudomonads, which are very good at spoiling protein foods by breaking down protein into shorter chain molecules and causing bitter tastes and eventually off odours in processed milk.

Pseudomonads produce extracellular enzymes that are very heat stable and can persist through dairying processes such as pasteurisation. These enzymes cause gelling of UHT milks, reduced casein yield for cheesemaking, and shorten the shelf life of pasteurised milk.

Good dairy hygiene and reducing and keeping the temperature of raw milk as low as possible on farm, during transport to processing and during storage prior to processing controls milk quality and food safety risks.

Enhancing milk safety & quality at the dairy

Raw milk has a mixed microflora, which is derived from several sources including the interior of the udder, exterior surfaces of the animals, environment, milk-handling equipment, and personnel.

In general, there are two means by which pathogens contaminate raw milk. Contamination may occur when micro-organisms are shed directly into raw milk from the udder as a result of illness or disease, or through contamination from the external surface of the cow and the milking environment. Factors on the farm and at the dairy that impact on contamination and the microbiological quality of the raw milk include:

- animal-related factors e.g. animal health (mastitis), herd size, age and production;
- environment-related factors e.g. housing, faeces, feed, soil, and water; or
- milking and operation of milking equipment factors e.g. cleanliness of equipment and lines; servicing of equipment.

It's also important to ensure your milk cooling system is routinely checked by trained service personnel and that cleaning and sanitising procedures for cooling and storage equipment are documented and implemented in accordance with the farm's Food Safety Program.

Managing the milk cooling rate within your food safety program

Your food safety program identifies how milk chilling capability is checked and the frequency of checks. It also details the records you keep that show checks on time and temperature.

Your food safety program also details how thermometers are tested for accuracy, how frequently the test occurs, and the records to show calibration is maintained.

All milk companies have specifications for milk cooling and storage in their farm food safety program, which should include the following as a minimum: milk cooling, milk storage, monitoring records & corrective action.

Dairysafe audits review how dairy farms perform against the milk cooling requirements.