

Developing a cleaning and sanitising program

A documented cleaning and sanitising program plays a key role in preventing the contamination of dairy food. Such a program is an integral part of a manufacturer's approved food safety program, and will ensure cleaning and sanitation tasks are carried out consistently and to a set schedule.

Types of cleaning and sanitising systems

The three most commonly used methods of cleaning in the dairy industry are:

- **dry cleaning** – performed without water or detergents and includes brushing, sweeping, wiping and vacuuming *e.g.* milk powder blending operations.
- **manual cleaning** – disassembly of equipment for cleaning by hand or cleaning in situ for equipment that cannot be disassembled *e.g.* conveyors.
- **cleaning in place (CIP)** – mechanical cleaning, partly or fully automated, requiring little or no disassembly of the processing equipment. See DFSV technical information note: Cleaning in place (CIP) systems.

Most dairy manufacturers will use a combination of these methods.

Developing the cleaning and sanitising program

The program must cover all product contact equipment and surfaces, as well as other surfaces within a dairy processing environment. It should follow a logical sequence for each area and item of equipment, and be prepared by personnel familiar with the processes and equipment *e.g.* production supervisors, quality assurance staff, and engineering personnel, and liaison with chemical suppliers.

When developing the program, the following factors need to be considered.

Types of soils

Dairy products generate a mixture of soil types (protein, fat, minerals, etc) and require different cleaning agents and treatment to remove them.

Types of surfaces

The type, temperature, pH and strength of cleaners and sanitisers should be appropriate for the food contact surface to minimise damage and deterioration.

Equipment design and capabilities

Poorly designed plant and equipment is the cause of many product contamination events. Always consider the

practicalities of cleaning, especially when purchasing or designing equipment. Avoid 'dead-legs' or obstructions in pipework/valves which restrict product flow and ledges and sills where soil may accumulate.

Processing environment and conditions

Cleaning should commence as soon as possible after production finishes to reduce the likelihood of product drying out on lines and equipment. Soils also become more difficult to remove from processing equipment due to factors such as run time, processing or environmental conditions. Examples include extended pasteuriser or evaporator runs that can result in burn-on of milk proteins, or fouling of membrane filters over time.

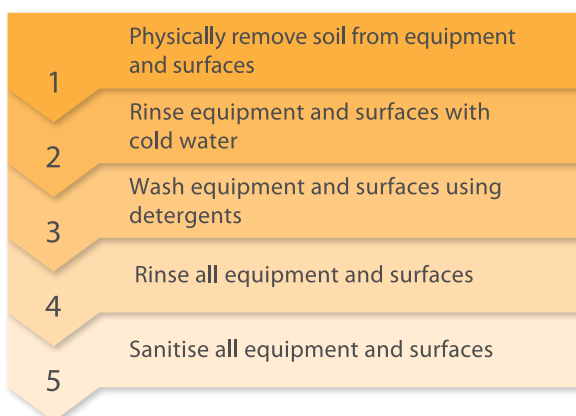
Critical hygiene areas

Food processing areas and equipment where high-risk foods are manufactured or prepared require critical attention to cleaning and sanitation *e.g.* infant formula blending, aseptic packaging areas. These high-risk areas may have specific cleaning requirements, including an increased frequency of cleaning.

Special consideration must also be given to processes and lines where ingredients containing allergens are involved. Production runs must be separated by a validated cleaning step and described in the food safety program.

Implementing the cleaning and sanitising program

Cleaning and sanitation programs following five main steps:



Plus: Clean and sanitise areas in the vicinity of processing equipment (including walls, floors, and drains in that order). Take care to minimise splashing or the creation of aerosols.



Cleaning and sanitising agents

Cleaning and sanitising chemicals should be suitable for food producing operations and used at the correct strengths, temperatures, and contact times. Multiple agents may be more effective than using a single agent. For example, alkaline detergents are effective on fatty residues, whereas acidic detergents remove mineral/protein deposits *e.g.* milkstone. Steam or hot water can be used as an alternative to chemical sanitisers. The rotation of cleaners and sanitisers can be an effective strategy to help prevent build-up of soils or organisms developing a tolerance to a single agent.

Always follow the manufacturer's recommendations for storing cleaning and sanitising agents. Failure to do so may result in the degradation of the active agents, particularly sanitising agents. Similarly, follow recommendations for the safe environmental disposal of chemicals.

Water

Water hardness, pH and turbidity will affect the performance of chemical agents. Water used in cleaning and sanitation activities should be soft and potable.

Cleaning equipment

Manual cleaning of some form will be required, even in the most automated production facilities.

Ensure cleaning equipment is not abrasive as it may damage surfaces, making them more difficult to clean. Regularly inspect equipment to check for wear – fragile or brittle components may present risks of contamination by foreign matter.

Segregate dry cleaning equipment from wet washing equipment, and food contact equipment from non-food contact equipment to prevent cross contamination. Colour coding is a simple and effective strategy to differentiate equipment.

High pressure cleaners – limit the use of high pressure hoses or water sprays as they create aerosols that cause cross-contamination of cleaned areas.

The potential for cross-contamination also exists when hoses are handled after they have been in contact with the floor. Self-retracting wall mounted hoses reduce the risk of contamination in this way.



Documentation

The cleaning program instructions must be specific to the factory site, and should include:

- a schedule describing the equipment and areas to be cleaned and sanitised, the frequency of cleaning and sanitising, the methods, cleaning and sanitising agents and concentrations, flow rates or exposure times for each chemical, and corrective actions for adverse results
- specific cleaning and sanitising procedures for critical or complex tasks
- clear allocation of roles and responsibilities for the day-to-day management of the program and competency requirements
- validation records which demonstrate cleaning and sanitation procedures are effective *e.g.* swabs, agar contact plates, ATP fluorescence tests.
- verification records which demonstrate successful implementation of the cleaning and sanitising program.

Key points to consider

- Designing a cleaning system suitable for a manufacturing process is critical to success.
- The cleaning/sanitising chemicals and regime vary according to the manufacturing process and the soils.
- Personnel implementing cleaning and sanitation programs must be suitably trained.
- Document the validation, verification and monitoring of all cleaning and sanitation programs.

References

Dairy Food Safety Victoria, Technical information note:

Cleaning in place (CIP) systems, DFSV, Melbourne, 2014.

Standards Australia (2000). **Cleaning and sanitizing dairy factory equipment**. (AS 1162-2000)

Standards Australia (1998). **Guide to the cleaning-in-place of dairy factory equipment**. (AS/NZS 2541:1998)

Further information

Further food safety technical information is available at www.dairysafe.vic.gov.au

Or contact Dairy Food Safety Victoria on (03) 9810 5900 or info@dairysafe.vic.gov.au

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