

## Calibration of monitoring equipment

Monitoring equipment used in the dairy industry fulfils a vital role in ensuring food safety and supporting compliance with regulatory and operational requirements. Regular calibration of such equipment is necessary to ensure ongoing accuracy and confidence that food safety controls are effective.

### Why do we calibrate instruments?

Calibration means to establish, by measurement or comparison with a known standard, that the value of each reading from a measuring instrument is accurate. It is important to calibrate equipment used in the food industry on a regular basis to:

- meet regulatory requirements – calibration ensures monitoring results are valid
- maximise product quality and ensure safety
- optimise the performance of equipment and reduce failures and downtime
- save energy and minimise processing and reprocessing costs.

### What needs calibration?

A wide array of monitoring equipment is used in the dairy industry. Such instruments include sensors, switches, gauges, and meters which measure and monitor process and product attributes such as: heating temperatures, product cooling, storage temperatures, humidity, pH, flow rate, product viscosity, physicochemical properties of milk, product weight, and the presence of foreign matter.

Various kinds of calibration and tests are required for monitoring equipment, including:

- general calibration – checking and calibration of equipment to verify they are performing as expected e.g. temperature sensors need to be calibrated frequently to ensure their accuracy as temperature is one of the key factors contributing to product safety and quality
- flow meter calibration – flow meters are used for measuring product flow, hence periodic calibration and validation is necessary to ensure their accuracy e.g. the rate of product flow through a pasteuriser requires an accurately calibrated flow meter to ensure the designated holding time is maintained



- tank level calibration – pressure sensors require calibration to ensure accuracy in managing inventory
- membrane and filter pressure calibration – accurate measurements of differential pressure across membranes and filters is necessary to achieve optimal membrane life and function
- calibration of scales – the weight or volume of a packaged dairy product must meet the requirements of the National Measurement Act 1960. Equipment used for weighing needs to be approved and verified before use, and calibrated regularly by a licensed service organisation to ensure compliance.

Calibration needs to be performed on a regular basis as it reduces the risk of error, and ensures highly accurate, traceable, and repeatable measurements during dairy processing.

### Developing a calibration procedure

A food safety program must include a pre-requisite program addressing calibration to certify the continual accuracy of all monitoring equipment. This should include the following:

- a register of all monitoring and measuring equipment, especially items critical to food safety
- documented procedures for how equipment will be calibrated, a schedule for calibration, and specifications for calibration
- records of all calibrated equipment, detailing how it is calibrated, date of calibration, who performed the calibration, and the results and accuracy of the calibration
- actions taken on any monitoring equipment found to be out of specification.

For guidance, always refer to equipment manuals or consult with equipment suppliers to determine exactly what attributes of the equipment need calibrating, and what credentials are required for personnel to be considered competent or authorised to perform the task.

The frequency of calibration will vary depending on equipment reliability, manufacturer recommendations, the operating environment of the instrument, and the difficulty involved in performing the task. For example, it may be sufficient to calibrate a thermometer mounted in a refrigerated storage tank annually, while a pH meter would require at least daily calibration due to probe fouling and frequent use.

Re-calibration will also be necessary following any modifications or changes to equipment, especially if it is a processing step designated as a CCP. For example, modifications to pipework or pump alterations in a pasteurising system may impact product flow, and consequently the heating and/or holding time of product in the pasteuriser.

In some circumstances, complex or sensitive calibration equipment or expertise will be beyond the resources of a manufacturer, so external providers with specialist testing equipment and expert knowledge in the field will be needed to undertake the task.

### Key points to consider

- The regular calibration of measuring and monitoring equipment and instruments ensures they function accurately and reliably.
- Regular and planned calibration of critical measuring and monitoring equipment will help ensure product safety and quality are managed and processing efficiencies are maximised.
- All manufacturers licensed with DFSV must include calibration as a pre-requisite program in their food safety program.

### Further information

Further food safety technical information is available at [www.dairysafe.vic.gov.au](http://www.dairysafe.vic.gov.au)

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

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