

CALIBRATION PROGRAM

All monitoring instruments, equipment and controlling devices used for ensuring quality, safety, sanitation and regulatory compliance, must be calibrated.

Calibration vs. Verification

First and foremost - it is important to understand the difference between these two terms as both are required in a food processing plant. **Calibration** is a measurement that compares a result with a known value or standard, under specific conditions. **Verification** compares that known value against some specification/performance limit to check compliance.

An example illustrating the difference between calibration and verification would be weigh scales. **Calibration** is an activity that is performed at a frequency established by the operator, usually minimum once a year, by a licensed or certified agency or person. They will come in and test the scales against known standards and adjust them as needed.

The operator may have an internal program that the scales are checked every day or once a week using standard weights, e.g. a 5kg weight, to ensure that they are maintaining the calibrated reading. This is known as **verification**.

The following are the eight steps for developing an effective Calibration Program:

1. Create a Master List

Prepare a master list of the monitoring instruments, equipment and controlling devices that may impact food safety that require regular calibration.

Devices that need periodic calibration include: pH meters, temperature measuring/recording devices, timing devices, pressure gauges, scales, temperature control units, metal detectors, magnets, flow meters (ex: chlorine feed rate meters), aw (water activity) meters, hygrometers and other specialized control instruments.

Climate control spaces (ex: freezers, refrigerators, smokehouses, curing and drying rooms) should be equipped with calibrated measurement or recording devices that will require calibration at an established frequency.

2. Determine Frequency of Calibration

The frequency of calibration can be established either by the manufacturer's recommendations, industry best practices or by regulatory requirements.

A risk assessment on each monitoring instrument, equipment or controlling devices should be conducted to assist in determining the frequency of calibration activities. One question that could be asked is "How important is that operation to product quality, safety or regulatory compliance?"

3. Document Calibration Procedures

Develop and document the calibration procedures for each of the identified pieces of equipment and controlling devices on the master list. The manufacturers of these devices should

provide the written calibration methods. These should be included in the equipment manuals or available online.

If using an outside agency, ensure that they provide the calibration procedures/methods they are using as well as the standards to which they are calibrating against.

Each procedure should contain at a minimum:

- Person responsible - Calibration procedures can be performed by a designated, trained staff member within the company or by a licensed or certified contractor.
- Step-by-step procedures on how the calibration should be done.
- Standards that will be employed.
- Tolerances - Include maximum error allowed before corrective action is taken (ex: $\pm 1\text{g}$, $\pm 5^\circ\text{C}$).
- How the results shall be reported.

4. Establish Corrective Actions

The importance of developing documented calibration procedures that include corrective actions cannot be overemphasized. One of the gaps observed in many calibration programs is that the corrective actions do not include what to do with product that may be affected.

Corrective actions may include:

- If the instrument is not in calibration, make the necessary adjustments to bring it back into calibration and retest.
- If the instrument is out-of-calibration, take it out of service and send it to the vendor for repairs. If it cannot be repaired, replace it immediately.
- A food safety assessment will be performed on any potentially affected product. In the event that product has been implicated product disposition may include cooking or disposal.

5. Record Your Activities

Records of all calibration activities must be maintained either as hard copies or electronically. Consistent records of all calibration activities should include:

- identification of equipment
- date
- person in charge of calibration
- reason for calibration
- calibration results
- calibration corrective action

Records should be maintained for a minimum of two years or the longest shelf life of the product manufactured.

6. Persons Responsible and Training

Calibration should be carefully performed by trained personnel. Training ensures that employees have the skills they need to

perform calibration activities. Equipment suppliers are a good resource and should provide technical support, service and training for calibration.

Training activities should be recorded and include at a minimum:

- Date of training.
- List of employees attending the training and their signatures as record of training received.
- Title or content of training (attached copy of training documents may be included here).
- Signature of employee providing training.

Training records should be maintained on file for the length of the employee's employment.

Outside Agencies

There are many instruments or pieces of equipment that processors look to outside agencies to calibrate, which may include scales, load cells, TIDs and others.

When hiring an outside agency for equipment calibration, verify the reliability of the company offering the services. In Canada, the accreditation of calibration laboratories is the responsibility of the Standards Council of Canada (SCC) Program for the Accreditation of Laboratories-Canada (PALCAN), and the National Research Council of Canada (NRC) Calibration Laboratory Assessment Service (CLAS).

Instrument	Serial #	Location	Frequency of calibration	Test method	Standards/ tolerances	Person responsible	Date last calibration	Date next calibration	Comments

Table 1: Master Calibration Schedule

7. Develop Master Calibration Schedule

One of the most valuable tools for documenting and organizing a calibration program is a master calibration schedule. Using all of the information that has been gathered, the Master Schedule can be easily developed.

Including all instruments that require calibration into this master schedule allows a processor to easily monitor the program as the whole program is summarized in one document.

8. Monitor and Review

The calibration program should be monitored and reviewed at a frequency established by the operator to ensure that the calibration program is being followed and is effective.

Activities should include:

- Review the records to ensure that they are up-to-date, have been completed, are accurate and document any deviations and corrective actions taken.
- On-site review to ensure that the person responsible for calibration is following the documented procedures.
- The calibration activities are being performed at the frequency established by the schedule.

For more information, resources, or help with your program please contact:

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