Equipment Calibration Guide for Food Processors

Adequate equipment calibration plays an important role in food safety when food is handled and produced. Calibration ensures that equipment monitors a food process accurately and consistently, and controls physical, chemical or biological hazards in the food operation.

**Measuring & Monitoring Devices**

All measuring and monitoring devices used in a food processing plant should be:

- calibrated at scheduled intervals
- identified with an approved identification record/marking after calibration
- protected from adjustments that may invalidate the calibration used and calibrated under suitable environmental conditions
- handled and stored cautiously to protect against deterioration
- calibrated by trained employees, using manufacturer’s specifications to ensure accuracy

When a measuring or monitoring device is outside specification, appropriate corrective action should be taken and records of calibration must be kept.

**Digital instruments** also require calibration; their analog circuitry performance can change over time.

**Calibration Using Standards**

Calibration of equipment should be performed against:

- standards
- certified equipment
- a new or recently certified unit that can be traced to a standard as a reference, ex: Canadian Standards Association (CSA) or the National Institute of Standards and Technology (NIST)

The equipment manufacturer or supplier can provide you with a recognized calibration kit (ex: NIST-traceable calibration) that meets official standard requirements for particular equipment. Trained employees can use this calibration kit and perform the calibration of the equipment when required.

**Equipment Requiring Calibration**

Equipment that requires calibration includes devices for measuring: temperature of thermal processes, quantities of food ingredients, and equipment measuring safety and quality-related product characteristics. The type of equipment that is used in a food plant depends on the product that is processed.
Common equipment needing calibration includes:

- **Magnets and Metal Detector**
  These are critical devices that should be calibrated by an accredited agency or the manufacturer at a predetermined frequency.

- **Temperature Measuring Devices**
  These calibrated temperature devices should be used to monitor temperature of thermal operations (ex: cooking, canning, pasteurization, irradiation, infrared heating) and cold storage rooms.

- **Scales**
  Scales ensure ingredients are weighted consistently. Inaccurately measured ingredients can be a source of food safety issues (ex: variation in product content of a preservative such as nitrates can allow bacterial growth).

- **Water Activity Meters \( (a_w) \)**
  The use of an inaccurate \( a_w \) meter may lead to the growth of bacteria, yeasts and mould in food products.

- **pH Meters**
  These are used to ensure accurate pH measurements on foods; inaccuracies may allow the growth of food-borne and food spoilage microorganisms.

- **Other Instrumentation**
  Other specialized instrumentation may be necessary to control critical factors, ex: chlorine injectors, chlorine concentration test equipment, gas pressure, etc.