

**Minnesota Department of Agriculture
Food and Feed Safety Division**

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Version #: 3	Effective Date: 1/17/2017
Title: Temperature Measuring Device Use and Accuracy	

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1. PURPOSE

This document describes the procedures used by the Minnesota Department of Agriculture (MDA) Food and Feed Safety Division (FFSD) Food Inspection staff to verify, maintain, calibrate or replace, and use temperature measuring devices (TMD).

2. SCOPE

This procedure applies to all TMDs used during inspections or investigations of food facilities including retail food handlers, (including mobile, temporary, and special event food stands), wholesale food handlers, wholesale food processors or manufacturers, farmers market stands, and food transportation vehicles, whether licensed, unlicensed, or a license is not required.

3. BACKGROUND

Temperature is a critical measurement for ensuring the safety and quality of many food products. There are a variety of commercial temperature monitoring devices available to inspectors and industry. Whether monitoring temperatures at receiving, throughout production or final product storage and distribution, thermometer calibration is essential. The accuracy of temperature measuring devices used for regulatory inspections is critical to ensure food safety as well as to build an enforcement case should violations be found during an inspection or investigation

4. RESPONSIBILITY

Training and Standards Administrator – The Training and Standards Administrator will confirm devices used for official temperatures are identified and send official devices for calibration or remove from use when needed.

Food Supervisor - The Food Supervisor will select appropriate temperature measuring devices to use during inspections when needed.

Inspector – The Inspector will select and use appropriate temperature measuring devices during inspections, conduct verification checks during inspections as needed, and conduct verification checks every 30 days as required by the procedure.

5. DEFINITIONS

Accuracy: Accuracy of a temperature measuring device is its ability to measure temperature correctly without error. A device must be within $\pm 2^{\circ}\text{F}$ ($\pm 0.5^{\circ}\text{C}$) of the actual temperature to be considered an accurate device.

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Calibration: Calibration is the process of standardizing a temperature measuring device to ensure that it will measure within a specific temperature range in which the instrument is designed to operate.

Verification: Verification is the process of checking the accuracy of a device.

Temperature Measuring Device (TMD or Device) – means a thermometer, thermocouple, or other device that indicates the temperature of food, air, or water.

6. PROCEDURES

6.1. Identify and select the appropriate device using the table below – Inspection Staff

Table 1. Temperature Measuring Device Descriptions

Type	Description	Official
Thermocouples (Digital)	<ul style="list-style-type: none"> A probe thermometer that is appropriate for thick or thin foods. This device should be placed at least ¼ inch into a portion of food for temperature measurement. Internal calibration is done initially by the manufacturer, and some allow the calibration to be adjusted by the user if required. Refer to the device manual for help. If no manual is available, use of the device must be discontinued until its accuracy can be verified and can be properly calibrated and adjusted. 	Official Device
Waterproof Lollipop Thermometer	<ul style="list-style-type: none"> Lollipop thermometers are able to record the highest temperature of a hi-temp dishwasher. They are used to verify that the proper sanitization temperature has been reached (since direct observation of maximum temperature is not possible). 	Official Device for dishwasher temperature verification only
Infrared Thermometers	<ul style="list-style-type: none"> Infrared thermometers do not measure internal temperature, but register surface temperature only, from a variety of distances based on the field of view. Typical applications would include scanning pre-packaged food cases or use in warehouse locations. Use of infrared thermometers is not appropriate when an internal temperature of the food product can be obtained without damaging the product or packaging. 	<u>Unofficial</u> : only to be used for screening purposes and not for measuring official temperatures.
Bimetal Stem Thermometers	<ul style="list-style-type: none"> The performance and accuracy of bimetal stem thermometers can easily be affected by rough handling, transportation, and repeated use. 	<u>Unofficial</u> : only to be used for screening purposes and not for measuring official temperatures.

6.2. Confirm all devices assigned out to inspection staff for official temperature measurements are uniquely identified - Training and Standards Administrator

- 6.2.1. If the device came from the manufacturer with a unique identification number on the back of the device, use this number for documentation and traceability purposes.

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- 6.2.2. In the absence of this unique ID number, assign the device a unique 4-digit number using a waterproof sticker or label with the device number. If a unique ID has already been assigned, DO NOT change the unique ID.
- 6.2.3. Create list items in SharePoint and enter known data for each new or newly assigned TMD prior to sending it to the inspector.

6.3. Temperature Measuring Device use during an Inspection – Food Inspectors

- 6.3.1. Assess every hot and cold holding unit in the firm during a risk-based inspection using one of the TMDs listed above with a unique identification and listed in SharePoint.
 - 6.3.1.1. Focus temperature assessments on products that are required to be held at specific temperatures for safety. The specific number of temperatures taken in each unit will vary depending on the volume of product and specific processes occurring.
 - 6.3.1.2. Investigate multiple products, packaging types and locations within a single holding unit so all considerations influencing holding temperature may be assessed to identify potential issues.
- 6.3.2. When holding units are limited to packaged food items, use of an infrared thermometer is limited to initial assessment of unit conditions. Use a probe thermometer placed firmly between multiple packages of food items for further investigative assessment of unit conditions only.
 - 6.3.2.1. If a possible violative temperature is identified, insert an Official Device (see Table 1) into the food product after notifying the Person-in-Charge.
- 6.3.3. When open food product is observed in a holding unit, use an Official Device to assess internal temperatures of food products.
 - 6.3.3.1. Sanitary practices including hand washing and thermometer cleaning /sanitizing are required when handling open food products.
 - 6.3.3.2. Clean the probe thermometer between every food product using an Alcohol Prep Pad which is saturated with Isopropyl Alcohol. A Prep Pad can be re-used for multiple food items.
- 6.3.4. Place the Official Device within the food product in a variety of locations (internal for incomplete cooling vs. out edges for defrosting issues).
- 6.3.5. Issue orders for violative temperatures per *FOOD.30.05 – Inspection Report SOP*.
- 6.3.6. Document non-violative temperatures taken during the inspection in the Inspection Food Temperature section of inspection report. Recorded non-violative temperatures may be from Official or Unofficial Devices.

6.4. Conduct and document a one-point Verification Check during each inspection IF violative temperatures are identified – Food Inspector

- 6.4.1. Use the Ice Bath OR Boiling Water method in the firm. Refer to *FOOD.WI.30.07 – Temperature Measuring Device Verification Methods*.
- 6.4.2. If ice or boiling water is not available during the inspection (example prepackaged refrigerated firm), record the most recent verification check completed on the device.

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6.4.3. Document the temperature from the Verification Check (either that done in the firm or from the most recent check) in the comments section of the inspection report using the standard comment language in USAFS.

6.4.4. If the onsite verification is not within the appropriate ranges, use a back-up official temperature measuring device or contact your supervisor if a back-up is not available.

6.5. Conduct a two-point Verification Check on all devices used for official temperature measurement every 30 days – Food Inspector

6.5.1. Conduct the verification check using the Ice Bath AND Boiling Water methods on a monthly basis or whenever accuracy is in doubt, whichever is more frequent. Both Ice Bath and Boiling Water methods are required because the TMD(s) are used for both cold and hot temperature measurements during the course of a typical inspection. Refer to *FOOD.WI.30.07 – Temperature Measuring Device Verification Methods WI*.

6.5.2. Record two-point verification check information in SharePoint. Refer to *FOOD.WI.30.08 – Temperature Measuring Device Verification Entry WI*.

6.6. Calibration to Reference Thermometer or Replacement of Equipment – Training and Standards Administrator

6.6.1. Upon device manufacturer's warranty end date or calibration due date, determine if official devices will be submitted to a certified laboratory for calibration against a reference thermometer or if they will be removed from use and replaced with a new device.

6.6.2. Communicate need for calibration and send a replacement TMD to food inspector at least one month before the TMD is due for calibration.

7. RELATED DOCUMENTS (includes References, Attachments)

FOOD.WI.30.07 – Temperature Measuring Device Verification Methods WI

FOOD.WI.30.08 – Temperature Measuring Device Verification Entry WI

8. EQUIPMENT/MATERIALS NEEDED

Temperature Measuring Device(s)

SharePoint

9. SAFETY

N/A

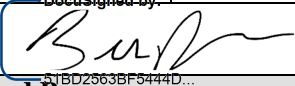
10. CIRCULATION

This policy will be circulated to the following individuals in the Food Programs: Manager, Supervisors, Inspectors, Compliance Unit, and the designated Support Staff. The current version will be stored electronically on the FFSD document control site.

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11. APPROVAL/DOCUMENT HISTORY

Document History		
Version #	Status (I, R)	Change History
1	I	Initial Policy Drafting.
2	R	Changed the frequency of verification checks from every two weeks to every thirty days. Added accuracy checks in the field if violations are identified were added to the SOP.
2.1	R	A one point verification (not accuracy) check was added to the procedure. Updated table.
3	R	Updated language throughout SOP to encompass change from division structure change from DFID to FFSD. Removed Thermistor-type thermometer from Table 1. Changed number assigned to thermometers from inspector ID to a 4-digit sequential number. Changed documentation of verification checks during inspections from the temperature table to standard comment language in USAFS.
DocuSigned by: 		1/17/2017
Approved By:		Date
Approved By:		Date

I = Initial document; R = Revised document