

Sustainable Food Safety 201



PEAK SHIFT

CHAPTER 5

The Flow of Food: An Introduction

Protect each handoff. Measure the food, preserve the history, and act on the evidence.

FDA Food Code 2026, Chapters 3-4; Annex 4 process approach

BASIS: TEACHING FRAMEWORK



Chapter Outcomes

Decision 1

Trace the food process and identify where control can be lost

Decision 2

Prevent cross-contamination and time-temperature abuse at each handoff

Decision 3

Choose, place, clean, and verify a temperature-measuring device correctly

The FDA Food Code is a model. The locally adopted code and regulatory authority control the operation.

Food Code 3-302.11; 3-501.16; 4-302.12

BASIS: TEACHING FRAMEWORK

The Flow of Food

Step 1	Receive and store
Step 2	Prepare
Step 3	Cook if required
Step 4	Cool and refrigerate if saving
Step 5	Reheat and hold if required
Step 6	Assemble and serve

Classify the process. Same-day cook-and-serve has no cooling and reheating cycle.

FDA process-approach guidance; Food Code Chapters 3-4

BASIS: PUBLIC HEALTH GUIDANCE

Three Process Patterns

No cook

Salad assembled from ready-to-eat ingredients; protect food without a cooking kill step.

Same-day cook

Burger cooked for service; one complete trip through the danger zone.

Complex process

Chili cooked, cooled, refrigerated, and reheated; multiple controlled transitions.

More trips through the danger zone create more points that require monitoring and corrective action.

Two Ways Food Loses Control

Contamination

A hazard moves onto food. Stop transfer and address affected food.

Time-temperature abuse

TCS food spends too long where pathogens may grow or toxins may form.

Clean the equipment and address affected food. These are separate corrective actions.

Preventing Cross-Contamination

Raw vs. ready-to-eat

Keep raw animal food away from food with no later kill step.

Raw vs. raw

Prevent transfer between different raw animal foods, except when intentionally combined as ingredients.

Shared equipment

Clean and sanitize before the next task.

Protected storage

Control drips and environmental contact with sound containers.

Separation controls the route before a correction is needed.

One Table, Two Tasks

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|---------------|---|
| Step 1 | Stop raw work; remove raw food and soiled tools |
| Step 2 | Discard affected food unless approved reconditioning applies. |
| Step 3 | Clean and rinse the table and tools |
| Step 4 | Sanitize for the required contact time; air-dry or adequately drain |
| Step 5 | Wash hands after dirty work and before ready-to-eat handling |
| Step 6 | Restart with clean tools and protected ready-to-eat food |

A quick wipe is not a task transition.

Food Code 2-301.14; 3-302.11; 3-701.11; 4-602.11; 4-703.11; 4-901.11

BASIS: FDA FOOD CODE + RESTAURANT BEST PRACTICE

Color-Coding Supports Separation

Code control

Prevent transfer and clean and sanitize equipment between uses.

House tool

Colors or labels can help staff keep tasks separate.

Important limit

A matching color never proves that a board is clean.

Best practice, not a universal FDA color requirement.

Food Code 3-302.11; 4-602.11; 4-703.11. Color assignments: restaurant practice

BASIS: FDA FOOD CODE + RESTAURANT BEST PRACTICE

The Temperature Danger Zone

Cold holding

41 F or less

Growth zone

41 F to 135 F

Hot holding

135 F or above

Temperature tells where the food is. Time history tells how long the risk has been building.

Food Code 3-501.16; Annex 3

BASIS: FDA FOOD CODE

The High-Growth Band

41 F to 135 F

Danger-zone recognition; NOT a universal discard clock.

About 70 F to 125 F

High-growth range in FDA cooling guidance; NOT a new holding limit.

135 F to 70 F in 2 hours

First cooling stage; total cooling still must reach 41 F within 6 hours.

Ordinary two-stage cooling: 135 F to 70 F within 2 hours; 135 F to 41 F within 6 hours total.

Food Code 3-501.14; Annex 3 public-health rationale for cooling

BASIS: FDA FOOD CODE + PUBLIC HEALTH GUIDANCE

Time History Beats a Snapshot

Cooked rice at 73 F

No time-control plan. No established safe history. No approved reconditioning.

Immediate action

Keep the rice out of service.

Final disposition

Discard it. A new reading or a new start time cannot establish the missing history.

Resolve what happens to the food. Holding it aside is not the final disposition.

Time Control: Know Which Route Applies

Standard 4 hours

Start at 41 F or below, or 135 F or above. Mark the 4-hour deadline.

Cold route: 6 hours

Start at 41 F or below; never exceed 70 F. Mark removal and the 6-hour deadline.

Narrow 4-hour option

Qualifying cut produce or opened hermetically sealed food: start and stay at 70 F or below.

Required safeguards

Written procedures in advance. Missing required time marks mean discard; never restart the clock.

By the deadline: cook AND serve, serve ready-to-eat food, or discard. Cooking alone does not stop the clock.

Monitoring and Corrective Action

Monitoring

Take a valid food reading and establish the process time.

Corrective action

Protect food, apply a permitted correction or discard, then verify.

A recorded temperature is a result. The food still needs a disposition decision.

Choose the Tool by Purpose

Internal food

Use a suitable food probe that reaches the representative risk point.

Thin food

Use a small-diameter probe designed for patties, filets, and other thin masses.

Food or equipment surface

Use a surface probe or infrared device for a surface-only question.

Air in a unit

Use an air probe or the unit's properly located ambient thermometer.

Warewashing surface

For hot-water mechanical warewashing, use the required irreversible registering indicator at the utensil surface.

The device name matters less than whether it measures the thing the question asks about.

Common Temperature Devices

Bimetallic stem

Thick food if its full sensing area fits inside.

Thermocouple / thermistor

Digital instruments; choose a compatible probe that fits the food and temperature range.

Infrared

Surface screening only; it does not prove the center temperature.

Ambient device

Air in storage equipment; sensor location matters.

Exposure indicator

May signal a defined time-temperature history, not a complete decision alone.

Read the stem for what must be measured: food, surface, air, or exposure history.

Probe Types and Their Jobs

Penetration probe

Internal food temperature; sensing area must fit the food.

Immersion probe

Liquid food such as soup or sauce; verify the probe range for hot oil.

Surface or air probe

Use the attachment designed for the surface or ambient-air question.

A probe attachment is selected for the target; the display unit alone does not define the measurement.

Device-use guidance; Food Code 4-302.12; Annex 5

BASIS: FDA FOOD CODE + DEVICE-USE GUIDANCE

Bimetallic Stemmed Thermometer

Common dial range	0 F to 220 F is a familiar pocket-model range; check the actual model.
Sensing area	On common dial models, the dimple marks the sensing area near the stem tip.
Insertion	Keep the full sensing area inside the food, away from the pan or bone.
Adjustment	Some models have a calibration nut. Follow the maker instructions and verify the result.
Thin food	Use a suitable small-diameter probe when the dial stem cannot measure the center.

The dimple is a device-recognition clue, not a universal feature on every thermometer.

USDA FSIS device-use guidance; follow the specific instrument instructions

BASIS: PUBLIC HEALTH GUIDANCE

Thin Food Requires a Small-Diameter Probe

Thin filet or patty

Use a small-diameter probe designed for a thin mass.

Thick stem

The sensing area may not fit within the food.

Placement

Insert from the side to reach the center; wait for a stable reading.

A thick stem can miss the true center or place part of its sensing area outside the food.

Infrared: Fast Surface Scan, Limited Proof

Infrared use

Quick surface screening without touching the food.

Infrared limit

Does not establish internal food temperature.

Scan to locate a concern. Probe internally when the decision depends on internal food temperature.

Placement Follows the Purpose

Cooking

Measure the coldest likely internal point.

Hot holding

Measure the coolest likely food portion.

Cold holding

Measure the warmest likely food portion.

Thin food

Keep a small-diameter sensing point inside the center.

Do not memorize 'always the thickest part' without asking what the process is trying to prove.

Food Code Annex 5: measuring food temperature; USDA FSIS placement guidance

BASIS: PUBLIC HEALTH GUIDANCE

One Reading May Not Represent the Batch

Uneven portions

Check representative pieces, especially the thickest or least-heated.

Deep container

Probe more than one point when the temperature may vary.

Decision

The lowest cooking or hot-holding reading and highest cold-holding reading matter.

Averages can hide the one portion that never reached control.

Wait for a Stable Reading

Step 1

Confirm the probe and range fit the target

Step 2

Position the complete sensing area correctly

Step 3

Wait for stabilization under device instructions

Step 4

Read before moving the probe; preserve time and result

Speed comes from the correct device, not from reading it before it stabilizes.

Food and Ambient Accuracy Are Different

Food thermometer

Fahrenheit-only: ± 2 F. Celsius or dual-scale: ± 1 C.

Air or water device

Fahrenheit-only: ± 3 F. Celsius or dual-scale: ± 1.5 C.

The question must tell you whether the device measures food or ambient air or water.

Equipment Air Thermometer Placement

Refrigerated unit

Sensor measures the warmest part of the unit.

Hot-food unit

Sensor measures the coolest part of the unit.

Air or simulated-product readings do not prove that every pan of food is in control.

Clean, Sanitize, Dry, and Protect the Probe

Step 1

Remove soil from the food-contact probe

Step 2

Wash and rinse using a method compatible with the device

Step 3

Sanitize at the required concentration and contact time

Step 4

Air-dry or adequately drain before food contact; do not cloth-dry

Step 5

Store the clean probe protected from contamination

Clean and sanitize the food-contact probe. Protect the instrument from water damage.

Food Code 4-602.11; 4-703.11; 4-901.11; 4-903.11

BASIS: FDA FOOD CODE

Calibration and Accuracy Checks

Code rule

Calibrate food thermometers per maker instructions as needed for accuracy.

Trigger

Check after a drop, damage, or an implausible reading.

Failed check

Adjust if allowed; otherwise remove from critical use for service or replacement.

Check questionable readings and dropped or damaged devices before trusting them.

Food Code 4-203.11; 4-502.11(B). Check triggers: device-use guidance

BASIS: FDA FOOD CODE + RESTAURANT BEST PRACTICE

Ice-Point Accuracy Check

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| Step 1 | Fill a clean container with crushed ice |
| Step 2 | Add clean water, stir, and let the packed ice slurry equilibrate |
| Step 3 | Insert the sensing area without touching the sides or bottom |
| Step 4 | Wait for a stable reading |
| Step 5 | Compare with 32 F or 0 C and adjust only as the device allows |
| Step 6 | If out of tolerance: adjust and recheck, or remove for service/replacement |

This is a common calibration method. Follow the manufacturer's instructions for the specific device.

Food Code 4-502.11(B); USDA FSIS and UC Extension device-use guidance

BASIS: DEVICE-USE GUIDANCE

Boiling-Point Accuracy Check

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| Step 1 | Confirm the method is allowed for the device |
| Step 2 | Bring clean water to a rolling boil safely |
| Step 3 | Insert the sensing area without touching the container |
| Step 4 | Wait for a stable reading |
| Step 5 | Compare with the local boiling point |
| Step 6 | If outside tolerance, adjust if allowed or remove for service/replacement |

212 F or 100 C is the sea-level reference. Altitude and atmospheric pressure change the boiling point.

Food Code 4-502.11(B); USDA FSIS and UC Extension device-use guidance

BASIS: DEVICE-USE GUIDANCE

Temperature Indicators: What They Prove

Time-temperature indicator

Signals defined exposure over time; use the product-specific criteria.

Maximum-registering device

Retains the highest temperature measured during the test.

Irreversible threshold label

Changes when its set temperature is reached; does not report an exact peak.

Hot-water mechanical warewashing: verify at least 160 F at the utensil surface, not only the machine-water display.

Food Code 4-302.13(B); 4-703.11(B); FDA seafood TTI guidance

BASIS: FDA FOOD CODE + PUBLIC HEALTH GUIDANCE

Six Steps for a Temperature Decision

Step 1	Name the process purpose
Step 2	Identify the least-controlled risk point
Step 3	Choose the suitable device and probe
Step 4	Clean, sanitize, place, and stabilize
Step 5	Compare the result with the applicable rule and time history
Step 6	Act and verify; document when required by the applicable rule or plan

This six-step checklist is a teaching framework. The applicable Food Code rule determines the limit and disposition.

Teaching checklist supported by Food Code Chapters 3-4; Annex 5

Three Decisions During a Rush

Action 1

Protect food and pause the affected decisions

Action 2

Use a verified internal probe for the soup

Action 3

Separate raw and ready-to-eat work and complete the station reset

Action 4

Clean and sanitize the dropped probe; check its accuracy before reuse

Action 5

Ask for teach-back and verify the correction holds

Protect affected food, decide its disposition, and verify the measurement.

Food Code 3-302.11; 3-501.16; 3-701.11; 4-302.12; 4-502.11(B)

BASIS: FDA FOOD CODE + RESTAURANT BEST PRACTICE

Chapter 5: The Rules That Carry Forward

Decision 1

Separate raw animal food from ready-to-eat food; clean and sanitize shared equipment

Decision 2

Use a food probe for internal temperature; infrared reads the surface only

Decision 3

A safe reading now does not prove a safe time-temperature history

Next: Chapter 6, Purchasing and Receiving. Chapter 7 then applies these controls to storage.