Food Safety Best Practices for Handling Fresh produce in Schools

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Agenda

- Food safety regulatory oversight of different foods
- Types of Hazards in Foods
- Produce outbreaks
- Food Safety Best Practices for Handling Fresh Produce in Schools
- A School Food Safety Program Based on HACCP Principles

Source: The Washington Post

Food safety regulatory oversight of different foods

USDA
Food Safety Inspection Service (FSIS)

Meats

Poultry

Amenable Species

US Food and Drug Administration (FDA)

Oil/Oil seeds

Tree nuts, Fruits, Vegetables

Seafood

Cereals and Grains

Dairy

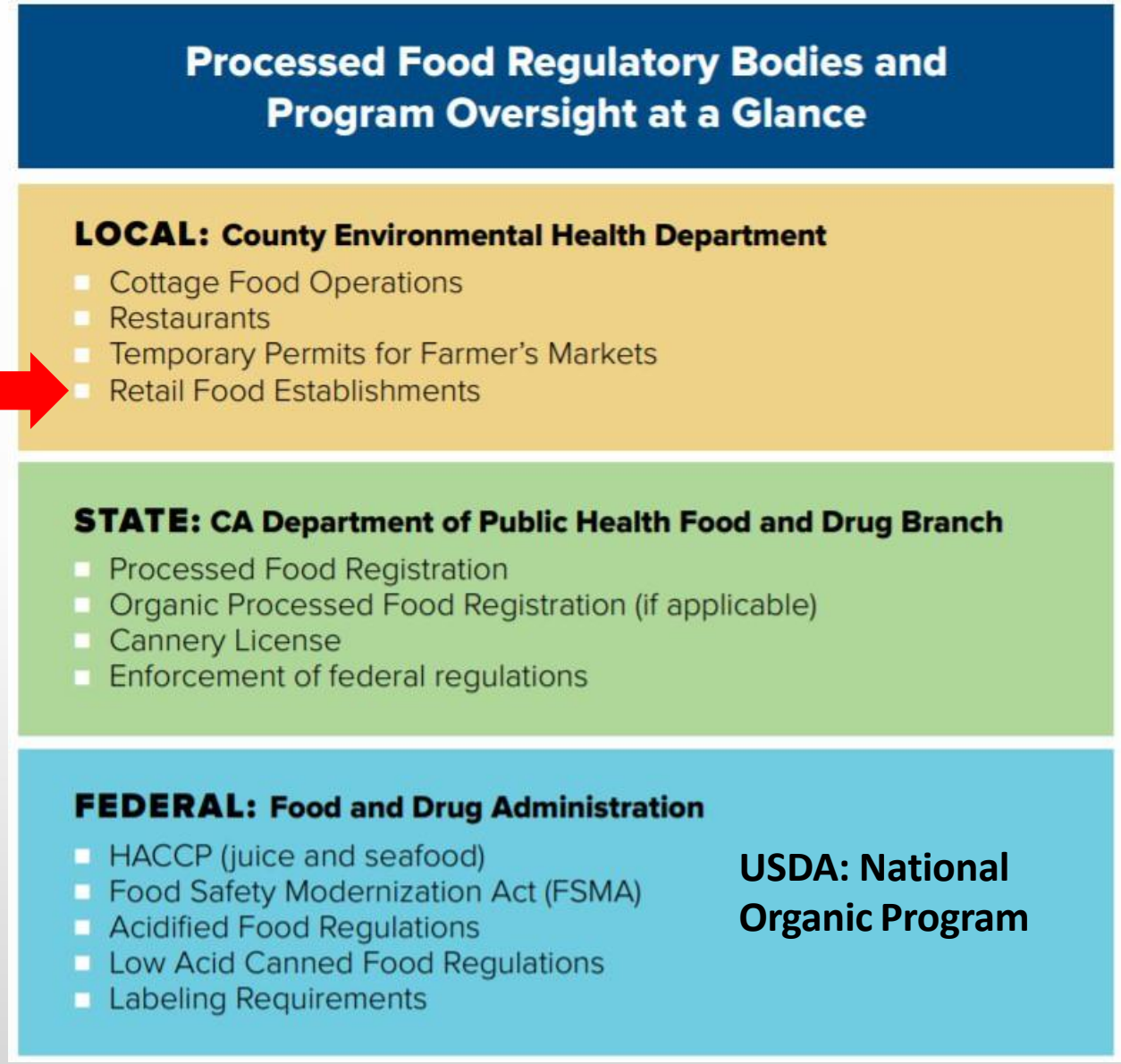
Additives and preservatives

Legumes

Juices

+ Everything Else

Courtesy of Dr. Erin DiCaprio


Processed Food Regulatory Bodies and Program Oversight at a Glance
LOCAL: County Environmental Health Department
Cottage Food Operations
Restaurants
Temporary Permits for Farmer's Markets
Retail Food Establishments
STATE: CA Department of Public Health Food and Drug Branch
Processed Food Registration
Organic Processed Food Registration (if applicable)
Cannery License
Enforcement of federal regulations
FEDERAL: Food and Drug Administration
HACCP (juice and seafood)
Food Safety Modernization Act (FSMA)
Acidified Food Regulations
Low Acid Canned Food Regulations
Labeling Requirements
USDA: National Organic Program

California

What about schools?

- Retail (grocery stores) and food service (schools) regulated by state, local, tribal, and territorial governments
- Various departments, agencies, bureaus, divisions, and other units
- The FDA Food Code 2017
  - Developed by FDA to safeguard public health and ensure food is unadulterated
  - Food safety guidance for retail and food service
  - Intended to serve as a model for states, local, tribal, and territorial governments to establish their regulatory and inspection framework

FDA Food Code 2017

https://www.fda.gov/downloads/Food/GuidanceRegulation/RetailFoodProtection/FoodCode/UCM595140.pdf

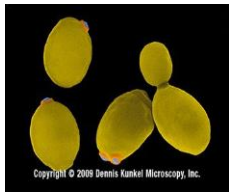
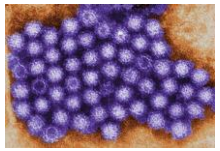
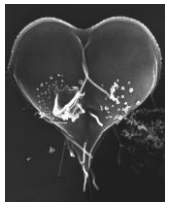
- Chapter 1: Purpose and Definitions
- Chapter 2: Management and Personnel
- Chapter 3: Food
- Chapter 4: Equipment, Utensils, and Linens
- Chapter 5: Water, Plumbing, and Waste
- Chapter 6: Physical Facilities
- Chapter 7: Poisonous or Toxic Materials
- Chapter 8: Compliance and Enforcement

- Preface – provides background and history
- Annexes – provides information on enforcement, management, inspections, food processing criteria, model forms, etc.

Types of Hazards in Foods

Courtesy of Dr. Erin DiCaprio

Microorganism Classifications

	 bacteria	 yeasts	 molds	 viruses	 parasites
Foodborne Illness	✔		*	✔	✔
Spoilage	✔	✔	✔		
Fermentation	✔	✔	✔		

*Some molds can produce a mycotoxin in certain foods.

Courtesy of Dr. Erin DiCaprio

Key terms

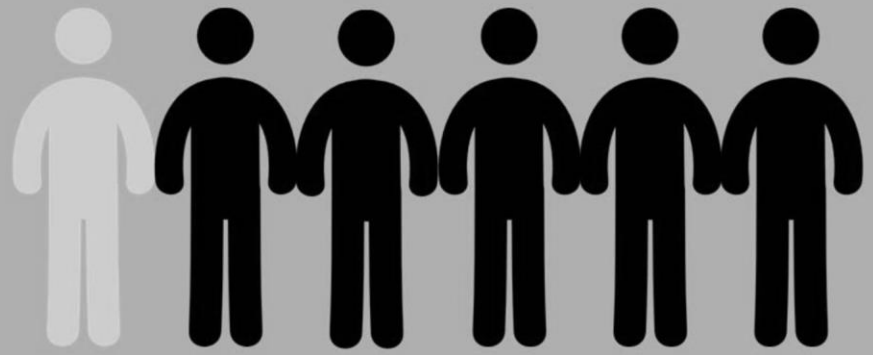
•Foodborne Illness: when a person becomes ill from eating contaminated or hazardous food

•Foodborne Illness outbreak: when a group of people consume the same contaminated food and at least two of them contract the same illness

•Recall: when a product is removed from store shelves due to its risk

The Burden of Foodborne Diseases

In the **United States**, **1 in 6** Americans contract a foodborne illness each year.



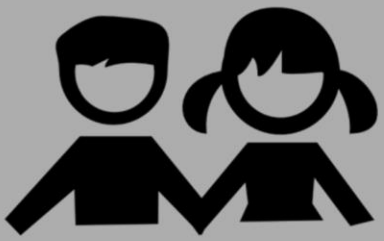
That's **48 million** annually, Resulting in …

128,000 hospitalizations

3,000 deaths

Globally, 600 M people contract a foodborne illness each year.

420,000 cases end in death.



Children under 5 are only **9%** of the world population, but **30%** of foodborne illness deaths. They bear **3X** their share of the burden.

Produce Outbreaks

- Romaine lettuce (2018)
- Leafy greens (2017)
- Packaged salad (2016)
- Ready to eat salad (2013)
- Spinach (2012)
- Romaine lettuce (2011)
- Shredded Romaine lettuce (2010)
- Spinach (2006)

Salmonella spp.

Escherichia coli

Listeria monocytogenes

- Sprouts (2018)
- Alfalfa Sprouts (2016)
- Alfalfa Sprouts (2016)
- Alfalfa Sprouts (2016)
- Clover Sprouts (2014)
- Bean Sprouts (2014)
- Bean Sprouts (2014)
- Clover Sprouts (2012)
- Alfalfa Sprouts (2011)
- Alfalfa Sprouts (2010)
- Alfalfa Sprouts (2009)

Salmonella spp.

Escherichia coli

Listeria monocytogenes

Courtesy of Dr. Erin DiCaprio

- Pre-cut melon (2018)
- Cantaloupe (2012)
- Cantaloupe (2011)
- Cantaloupe (2011)
- Cantaloupe (2008)

Salmonella spp.

Escherichia coli

- Case Count
  - 147/33

Listeria monocytogenes

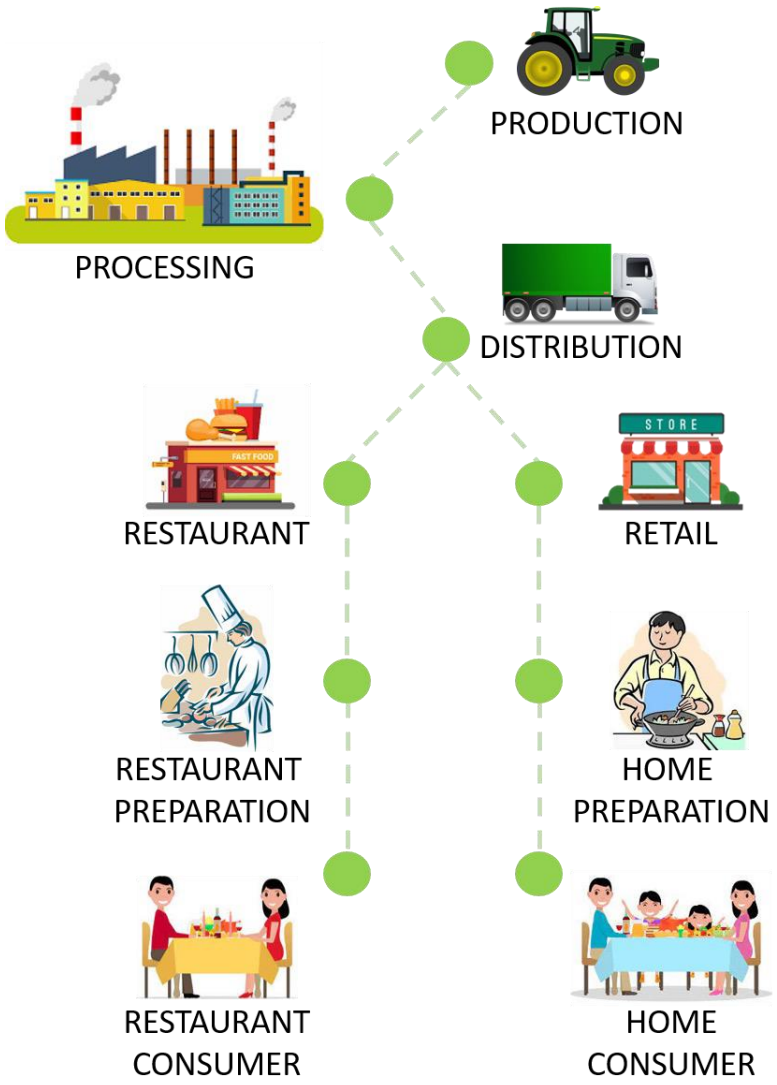
- Cucumbers (2015)
- Cucumbers (2014)
- Cucumbers (2013)

Salmonella spp.

- Case Count
  - 2015: 907/6
  - 2014: 275/1
  - 2013: 84/0

Escherichia coli

Listeria monocytogenes

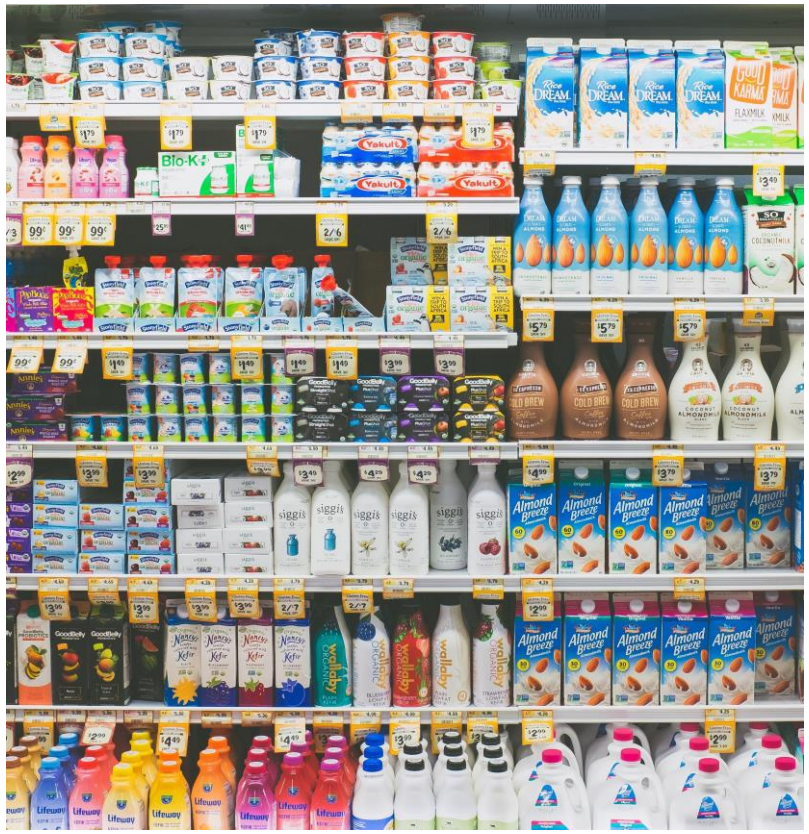


How Food Gets Contaminated - The Food Production Chain

During growing or pre-harvest

Post-harvest processing and transportation

Final processing and handling before food is eaten or sold



Some foods are riskier than others

There is no further processing step that eliminates microbial hazards!

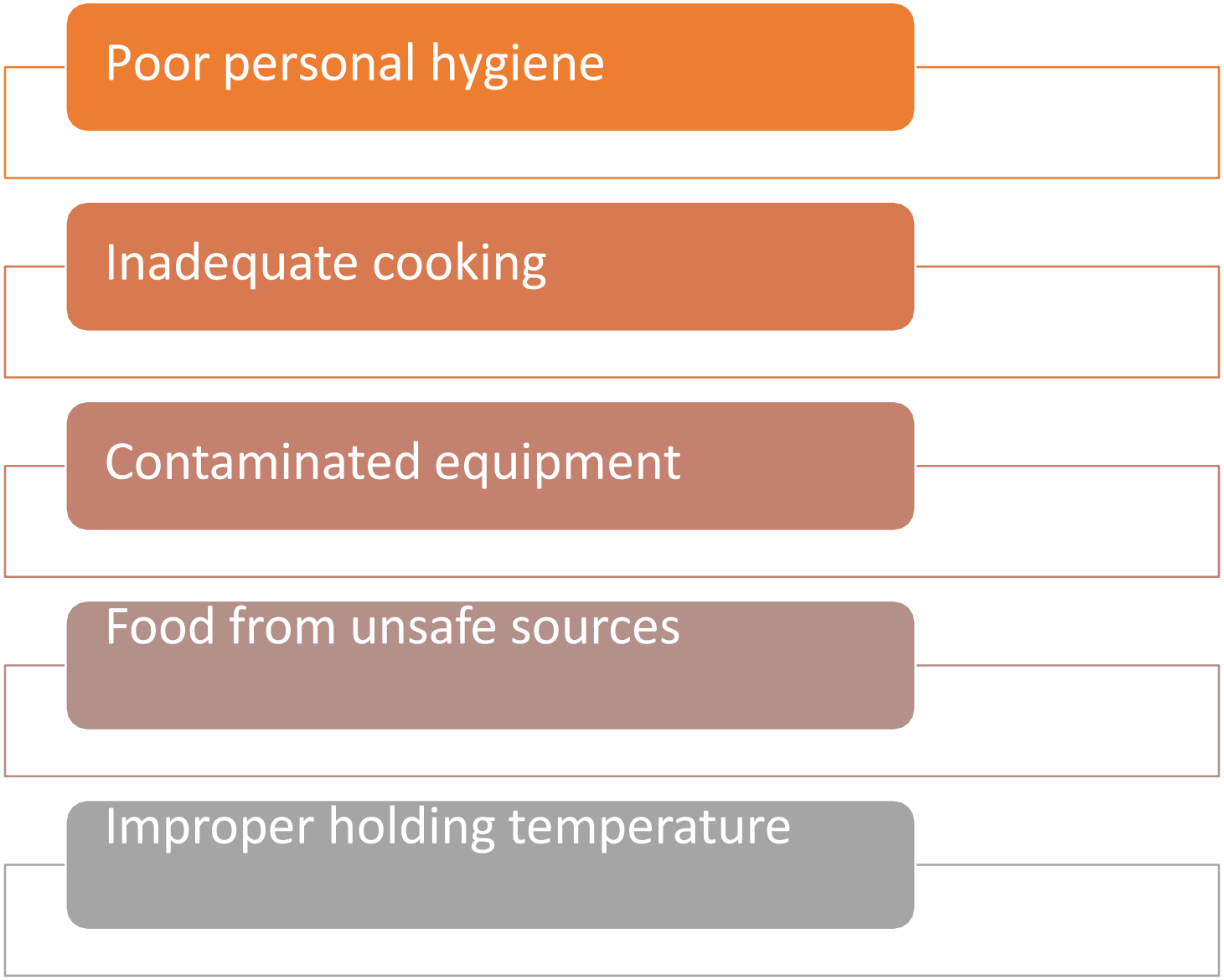
FOOD SAFETY BEST PRACTICES FOR HANDLING FRESH PRODUCE IN SCHOOLS

- Fresh produce must be handled safely to reduce the risks of foodborne illness

- Steps individuals can take to minimize risk of microbial contamination

https://calmatters.org/commentary/my-turn/2021/03/transform-school-meals-to-nourish-kids-and-create-opportunities-for-farmers/

Five major risk factors related to employee behaviors and preparation practices in retail and food service that contribute to foodborne illness



It all begins with Worker Personal Hygiene

Humans can be a source of many foodborne hazards → hands, clothing, or footwear

Individuals can spread pathogens to produce because they directly handle fresh produce

No ill workers

- Excluded from processing activities

Develop and implement a written policy or SOP:

- Report illness and symptoms of illness
- Develop and implement SOP for handwashing

FOOD workers shall wear clean outer clothing to prevent contamination of FOOD, EQUIPMENT, UTENSILs, LINENS, and SINGLE-USE ARTICLES.

Prevent Foodborne Illness

Report Symptoms

- Vomiting
- Diarrhea
- Sore throat with fever
- Jaundice (yellowing of skin and eyes)
- Wounds on the hands or arms
- Diagnosed foodborne illness
- Exposure to foodborne illness

Handwashing to Prevent the Spread of Disease

When is handwashing required?

Before entering a food preparation area

When changing tasks and switching between handling raw foods and working with ready-to-eat foods (to prevent cross-contamination)

When hands become contaminated

After using the toilet

After coughing, sneezing or blowing your nose, eating or drinking

After returning from lunch

Steps for proper handwashing

1

WET

2

LATHER

3

SCRUB

4

RINSE

5

DRY

Avoid

Avoid

Source: Boyd products

Activity

Preventing Bare Hand Contact with Ready-to-Eat Foods

Purpose?

Gloves

Proper glove use

- Gloves not a substitute for hand washing!
- Ensure gloves are clean before use
- Single use gloves are not reused
- Replace gloves that are soiled or torn
- Be mindful of what gloves touch

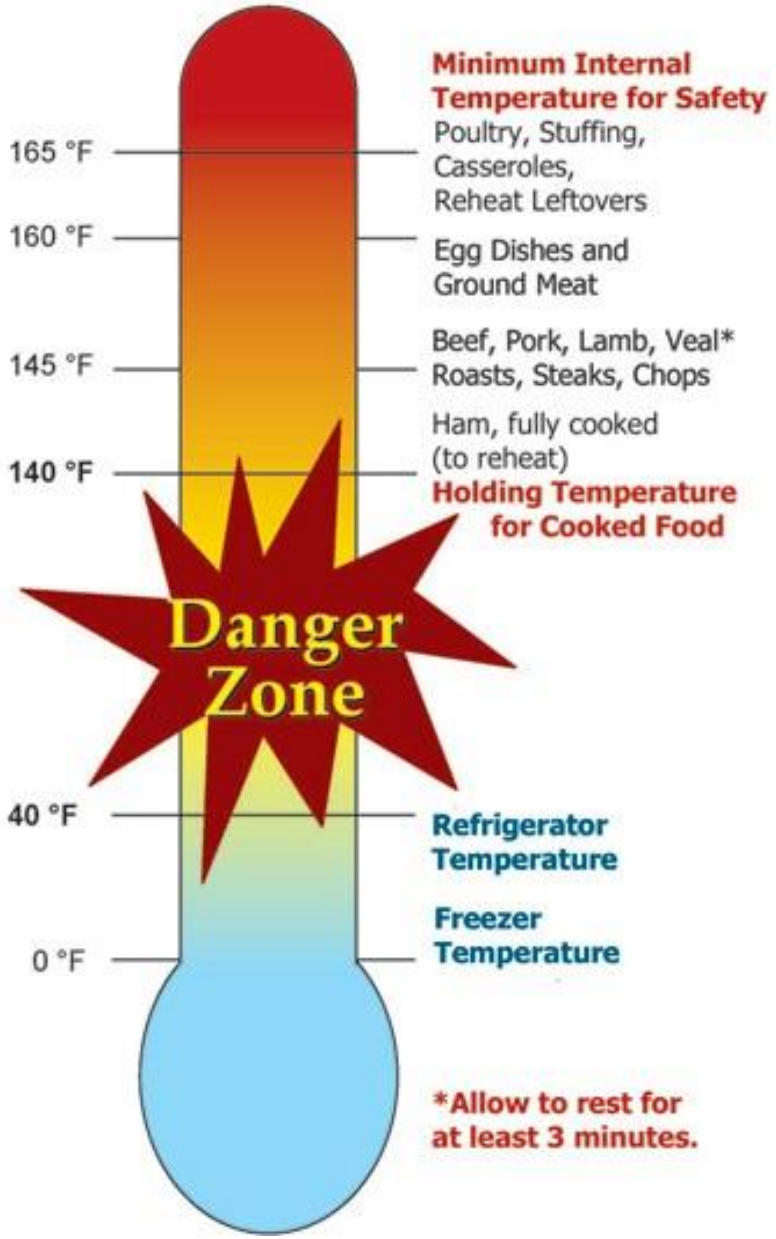
Temperatures for Food Safety

•Temperature danger zone - why it is important to food safety

- Why use thermometers

- How, when, and why to calibrate a thermometer

•Important food temperatures to monitor throughout the foodservice process



Source: USDA

Temperature Danger Zone (41°F to 135°F)

Food Safety Practices to Expect from Your Fresh Produce Supplier

- *Good Agricultural Practices (GAPs)* to verify that fruits and vegetables are produced, packed, handled, and stored in the safest manner possible to minimize risks of microbial food safety hazards
- Incoming transport vehicles are inspected for cleanliness, possible cross contamination risks, and pests.
- Fresh produce is received and inspected for quality, temperature of product, including information for traceability such as harvest date and supplier identification.

Purchasing & Receiving

- Cold food: 41 °F or below

Storing

- Refrigerator: 41 °F or below
- Freezer: at or below 0 °F

Preparing

- Hold cold food at or below 41 °F
- Prepare cold food in small batches

•Whole raw fruits or vegetables, and cut raw vegetables, may be immersed in ice or water.

Preparing

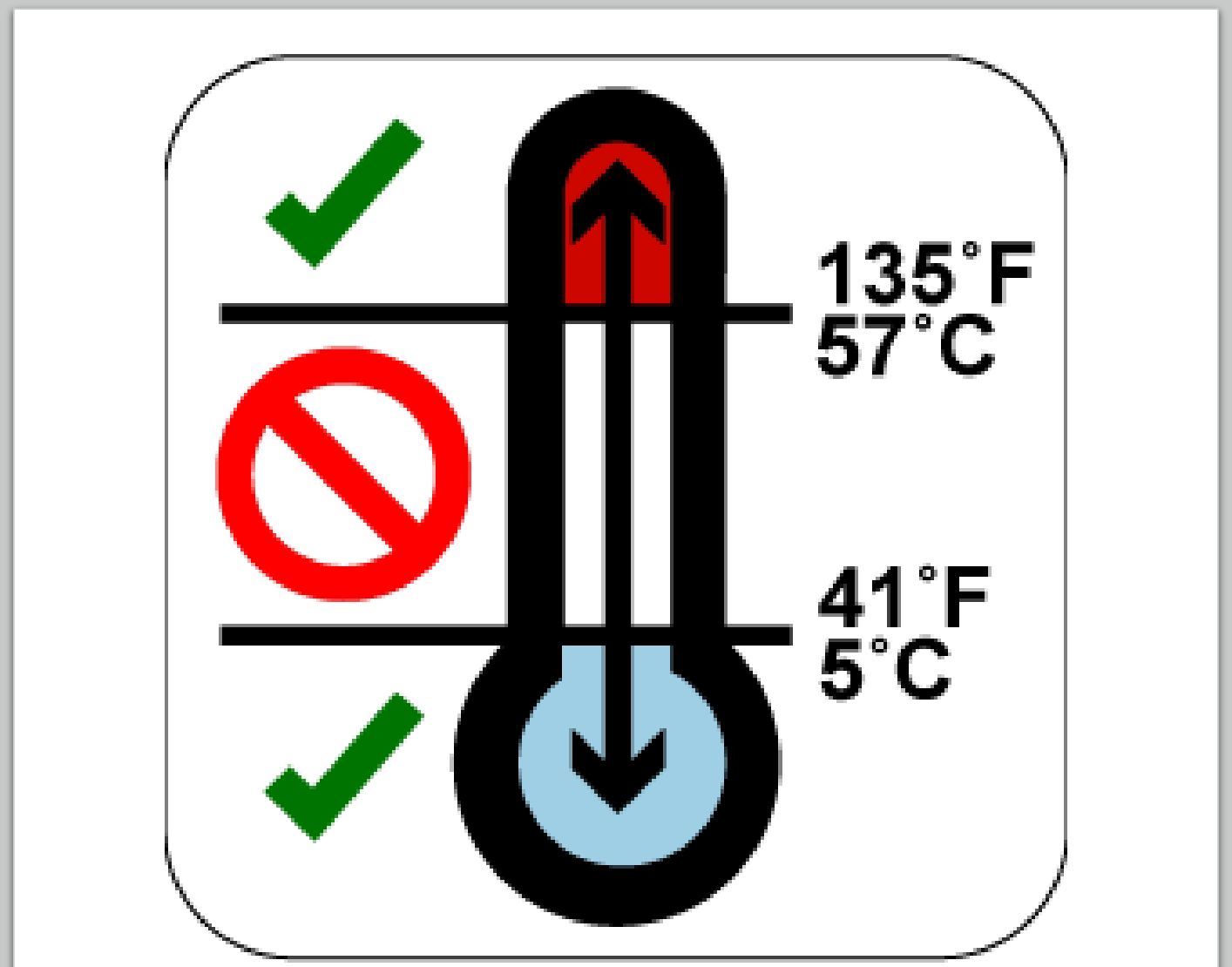
Holding and Serving

•Keep COLD FOODS at or below 41°F

•Keep HOT FOODS at or above 135°F

Temperature abuse

The longer foods are in this zone, the higher risk for pathogen growth.



Cooking

- 165°F for 15 seconds
  - Ex. Poultry
- 155°F for 15 seconds
  - Ex. Hamburger
- 145°F for 15 seconds
  - Ex. pork roast
- 135°F for 15 seconds
  - Ex. frozen vegetables

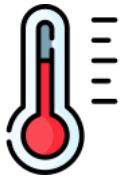
✓ Record all temperatures when they are taken.
✓ Use only a clean and sanitized thermometer when taking internal temperatures of foods.

NO COOK
Example: Fruit Salad

RECEIVE
Controls: Known Source, Receiving Temperatures

STORE
Controls: Proper Storage Temperatures, Prevent Cross Contamination, Store away from chemicals

PREPARE
Controls: Personal Hygiene, Restriction of Ill Employees, Prevent Cross Contamination



Temperature Control: COLD HOLDING
Hold at 41°F or Below.
Check and record temperatures

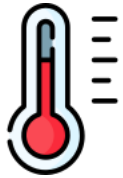
SERVE
Controls: No Bare Hand Contact with Ready to Eat Food, Personal Hygiene, Restrict Ill Employees

SAME DAY SERVICE
Example: Baked Chicken

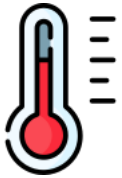
RECEIVE
Controls: Known Source, Receiving Temperatures

STORE
Controls: Proper Storage Temperatures, Prevent Cross Contamination,
Store away from chemicals

PREPARE
Controls: Personal Hygiene, Restriction of Ill Employees, Prevent Cross Contamination



Temperature Control: COOK
Internal Temperature of 165°F for 15 seconds.
(For chicken)
Check and record temperatures



Temperature Control: HOT HOLD
Hold at no less than 135°F.
Check and record temperatures

SERVE
Controls: No Bare Hand Contact with Ready to Eat Food, Personal
Hygiene, Restrict Ill Employees

Avoiding Contamination of Fresh Produce

- Three types of food contamination
- Methods for preventing food contamination
- How proper cleaning, rinsing, and sanitizing can prevent food contamination

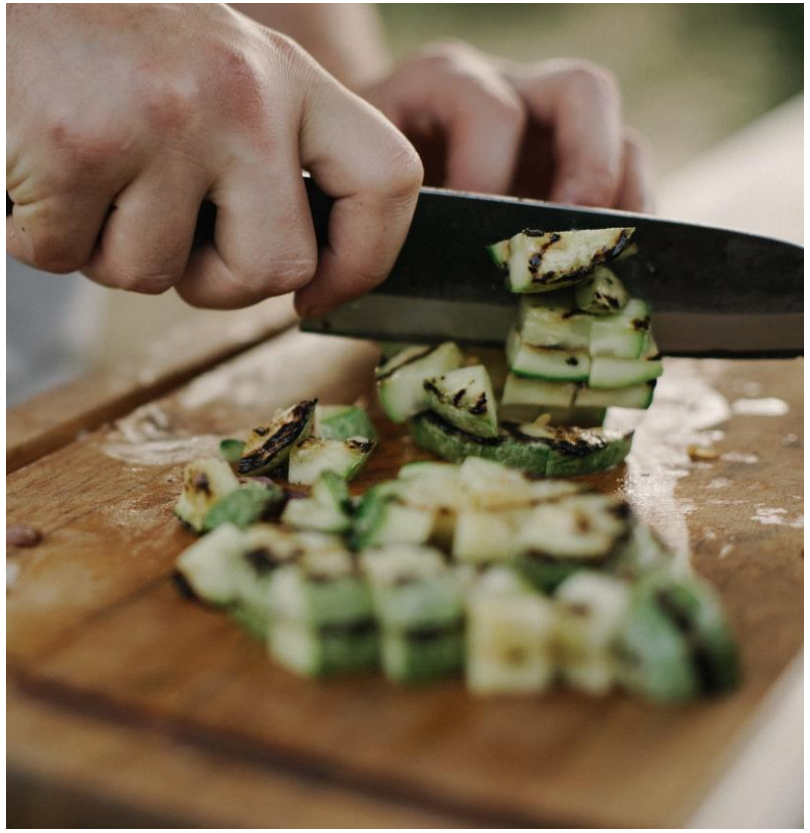
FOOD shall be protected from cross-contamination: Utensil-to-Food Cross Contamination

RAW MEAT

FRESH-PRODUCE

Prevention

Avoid



Hand-to-Food Cross Contamination

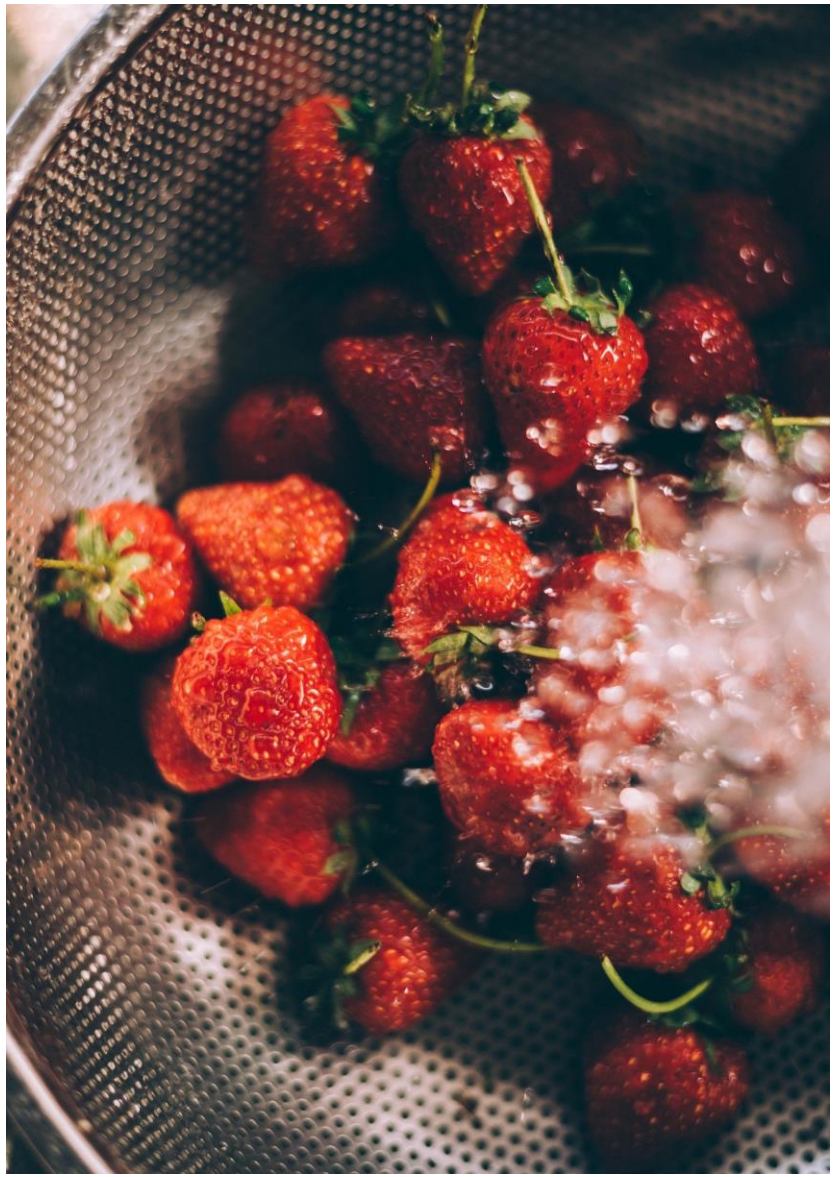
Equipment and Food Contact Surface-to-Food Cross Contamination

FOOD shall be protected from cross-contamination

Washing Fresh Produce

- Harvested fresh produce is highly perishable
- Inspect produce for obvious signs of soil/damage prior to cutting, slicing, or dicing
- PRODUCE shall be washed in POTABLE WATER to remove soil and other contaminants before being cut combined with other ingredients, cooked, served, or offered for human consumption in READY-TO-EAT form, except as specified in subdivision
- Water used for washing fresh produce
  - No detectable generic *E.coli*
  - if re-used for multiple “batches” water quality must be monitored

Prevention – use a container to wash produce



Avoid

Cleaning and Sanitizing of Equipment

Any unclean surface that contacts produce can harbor pathogens and serve as a source of contamination

Establish a schedule for cleaning and sanitizing food contact surfaces, including equipment & tools

Standard Operation Procedure (SOPs)

Stainless steel and food grade plastic are easy to clean/sanitize

Facility management

Keep facilities clean and sanitary

Proper drainage of grounds to avoid standing water

Cleaning and Sanitizing

https://www.qwick.com/blog/working-as-a-dishwasher-tips/

https://www.schoolphotoproject.com/kitchen-household/kitchen-sink-photo2.html

Steps to clean and sanitize a food contact surface

1

PRE-RINSE

Remove debris and dirt from surface

2

WASH

Use detergent to scrub the surfaces

3

RINSE

Use potable water to rinse the surface

4

SANITIZE

Use food contact sanitizer following label directions

Training & Education

Individuals must be qualified by education, training, or experience to prepare, handle or serve food

Individuals must receive food hygiene and food safety training (food protection manager or certificate in food safety & sanitation)

School manager responsible for ensuring compliance must have appropriate knowledge, training or experience

Why Food safety training is important?

Required by regulations

Equip employees with sufficient food safety knowledge

Enhance employees' compliance with food safety practices

What should be covered in the training?

Importance and best practices of personal hygiene

- Proper handwashing, following clothing requirements, wearing gloves and other hair restraints when appropriate
- Avoid working when sick

Basics of sanitary operations of food production facilities

- Maintaining sanitary conditions of food production facilities, equipment, and utensils

A School Food Safety Program Based on HACCP Principles

A school food safety program must include:

- Standard Operating Procedures
- A written plan at each school food preparation and service site for applying HACCP principles using the process approach

Useful resources

•UC Davis Food Safety

https://ucfoodsafety.ucdavis.edu

•USDA Food-Safe Schools Action Guide

https://www.fns.usda.gov/ofs/food-safe-schools

•Produce Safety University Summer Series

https://theicn.org/psu/psu-summer-series/

- Food banks and food pantries – North Carolina State University

https://foodsafety.ces.ncsu.edu/community-food-safety-resources/food-pantries-and-food-banks/

•Flash Food safety Videos

https://www.fns.usda.gov/ofs/food-safety-flashes

Questions ?