

# Food Handling Practices in Schools



Produce Safety Workshop

October 28, 2009

Jeannie Sneed, PhD, RD, SNS, CP-FS

Food Safety Specialist, USDA FNS



# Food Safety in Schools

- Schools have a good food safety record
- Foodborne Outbreaks 1998-2006
  - About 4% of outbreaks
  - N=472, 63% associated with food prepared in schools

# Foods 1998-2006

Commodity	# Outbreaks	Illnesses
Meat and Poultry	33	1444
Dairy	3	367
Eggs	1	29
Produce (all)	17	1178
Vegetables (all)	9	887
Leafy	6	267
Vine	2	545
Sprouts	1	75
Fruits/Nuts	8	291
Complex Foods	92	5901
Unknown	146	9328

# Contributing Factors

Contributing Factor	# Outbreaks
Sick food handler	50
Food kept at room temperature several hours	27
Bare-handed food contact	16
Other source of contamination	14
Preparation half day or more before serving	14
Inadequate cold holding	13



## School Studies funded by Cooperative States Research, Education, and Extension Service

1. Mentoring Model for HACCP Implementation in School Foodservice Operations
2. Mitigating Cross Contamination in Retail Foodservice Operations



# Study Summary

- Mentoring Model                      2002-2005
  - 40 school districts
  - 3-year study
  - Year 1 and Year 2 site visits
- Cross Contamination              2005-2008
  - 20 operations, schools, restaurants, child care, assisted living
  - 2 site visits Year 1, 1 site visit Year 3

# Common Food Handling Problems Observed in Iowa Schools

- Not taking and recording temperatures of food
- No calibration of thermometers
- Cold foods not being 41°F or lower
- Inadequate handwashing
  - Not frequent enough
  - Poor technique
  - Using hand dips in dishrooms

# Common Food Handling Problems Observed in Iowa Schools, cont.

- Improper sanitizing
  - No fill lines on sinks
  - Incorrect chemical concentrations and not checking concentrations
  - Mixing detergent with sanitizers
  - Not sanitizing surfaces such as handles
- Improper thawing techniques
- Improper cooling techniques



# Common Food Handling Problems Observed in Iowa Schools, cont.

- Poor dishroom techniques
  - Towel drying of dishes
  - Use of hand dips between dirty and clean end of dish machine
  - Use of fans blowing on dishes

# Issues Related to Produce

- Handwashing
- Cold Chain Management
- Cross Contamination



# Issue 1. Handwashing





# Handwashing

- Research Findings
  - Inadequate frequency
  - Inadequate procedures
  - Inadequate steps to prevent hand contamination

# Handwashing Observations

- 60 hours observation; 1-2 employees observed
- Observations
  - Should wash
  - Did wash
  - Procedure

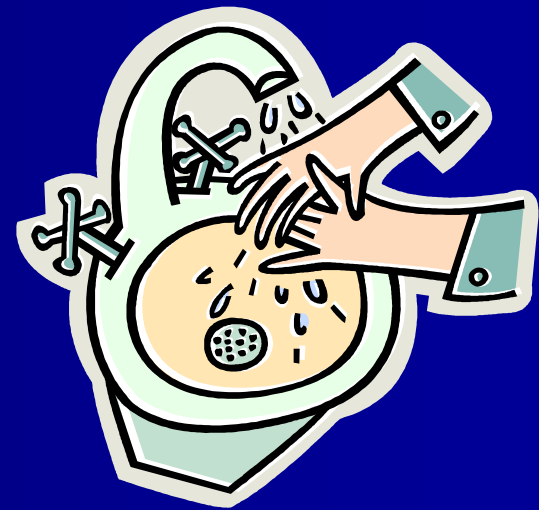


# Results

- 23% compliance rate
- Highest compliance—entering work area
- Low compliance
  - After eating and drinking
  - Before donning gloves
  - Changing tasks

# Handwashing Benchmarks (no. times per employee hour)

■ Production	11
■ Service	12
■ Cleaning	8
■ Overall	11



# Issue 2. Cold Chain Management





# Cold Chain Management Considerations

- Refrigeration Space Limitations
  - Old buildings/small refrigeration units
  - Limited number of deliveries each week
  - Competition for space
- Cold Holding Limitations
- Perceptions about what is a potentially hazardous food



# Some Supporting Data

- Cold food held at 41 °F or below in 21 of 39 schools 1<sup>st</sup> visit; 23 of 35 schools 2<sup>nd</sup> visit
- Hot food held at 140 °F or higher in 34 of 40 schools 1<sup>st</sup> visit; 34 of 35 schools 2<sup>nd</sup> visit

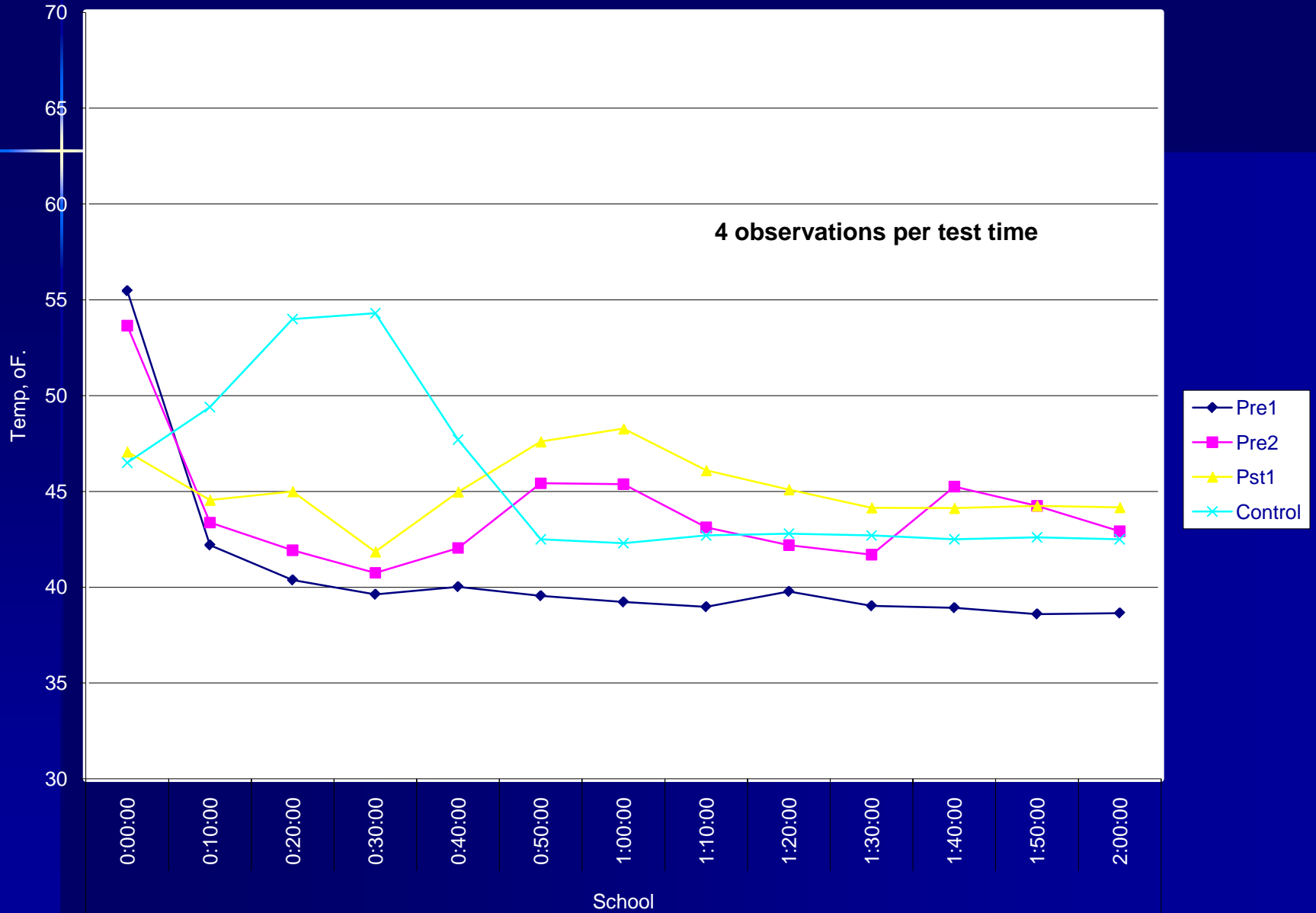
As educators, we seem to have gotten the word out about hot food!

# Knowledge Problem Areas

## Schools

- 40-50% missed
  - Temperature Danger Zone
  - Appropriate cooling procedures
  - Chlorine sanitizing procedures

# Cold Meat/Sandwich Temps



# Issue 3. Cross Contamination



# Sources of Cross Contamination

- Receiving/Storing
  - Delivery person placed products in storage
  - Food stored on floor
  - Broken ceiling tiles
  - Raw/prepared foods in close proximity
  - Inadequate coverings

# Sources of Cross Contamination, cont.

## ■ Preparing

- Packages on food contact surfaces
- Touching other surfaces (such as refrigerator handles)
- Multiple items on same cutting board
- No sanitizing of food contact surfaces
- F&V not washed in preparation
- Sinks used for multiple purposes
- Towels used for wiping/drying multiple surfaces

# Sources of Cross Contamination, cont.

- Transporting
  - Uncovered
- Serving
  - Self service
  - Inadequate sanitizing of surfaces
  - RTE foods served with bare hands



# Sources of Cross Contamination, cont.

- Standard Operating Procedures
  - Inadequate Cleaning and sanitizing of FCS
  - No handwashing between handling dirty and clean dishes
  - Sanitizer concentration not checked
  - Sanitizing concentrations too low
  - Hot water not hot enough
  - Limited corrective actions taken

# Total Plate Count

Acceptable: <1-20

Sample	Schools Range
Food Contact Surface	<1-38,800
Equipment	5-435,000
Hand sink handle	<10-675,000
Refrigerator Handle	5-715,000
Tray	<1-820

# Staphylococcus aureus

Acceptable: <10

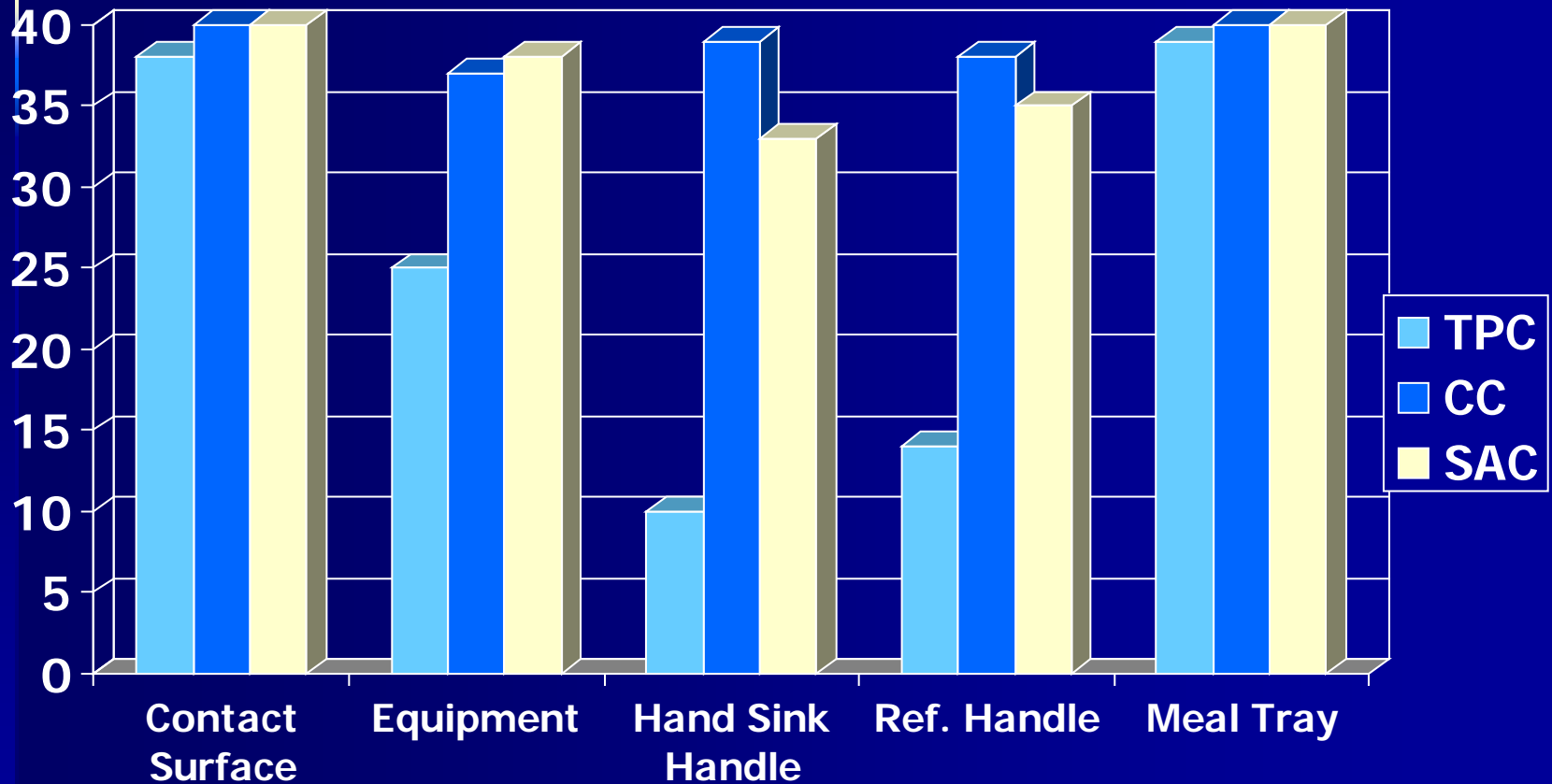
Sample	Schools Range
Food Contact Surface	<1
Equipment	<10-10
Hand sink handle	5-6,850
Refrigerator Handle	5-2,750
Tray	<1

# Coliform Count

Acceptable: <10

Sample	Schools Range
Food Contact Surface	<1
Equipment	<10-260
Hand sink handle	<10-25
Refrigerator Handle	<10-15
Tray	<1

# Microbiological Study in Iowa Schools (No. meeting standard)





Microorganisms from the refrigerator door handle



Microorganisms from gloved hand that touched the handle



**Microorganisms found  
on the bottom of the**



**lettuce box**

**Microorganisms from  
fingers that have  
touched the lettuce box**



**Microorganisms found  
on the celery bag**



**Microorganisms from  
fingers after touching the  
celery bag**



**Microorganisms found  
on the counter after the  
celery bag sat on it**





# The glove box isn't that clean





A clean and sanitized cutting board shows no sign of microorganisms

# Conclusions

- There are food handling issues that could increase likelihood of produce contamination
- Employee education is needed
- Policies and procedures need to be strengthened
- Supervision is key

