Mentoring Model for HACCP Implementation in School Foodservice Operations

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Project Goal

Develop a mentoring model for HACCP implementation in school foodservice programs to increase the number of school districts that have comprehensive HACCP programs.

Research Design

- Pretest Posttest Quasi-Experimental Research Design

  Evaluated employee attitudes, knowledge, and food handling practices
  - 6 Attitude questions
  - 20-question knowledge test for employees
  - Visual audit
  - Microbiological tests for five food contact surfaces
- Sample
  - 40 school districts in Iowa
  - 1 on-site production kitchen in each district

Project Objectives

1. Increase employees' knowledge of food safety and improve their food handling practices.
2. Develop sample HACCP resources appropriate for school foodservice and use Iowa State University's Food Safety web site for national distribution of these resources.
3. Develop and test a HACCP implementation mentoring model.

Training Interventions

- ServSafe® Training for 185 employees
- Written reports of initial (pretest) and follow-up visit (posttest)
- Regional HACCP training sessions
  - 1 in Year 1 focused on need for HACCP, program assessment, first three HACCP principles, and plans for getting started; 86 attended
  - 1 in Year 2 focused on last four HACCP principles and implementation plans; 84 attended

Resource Interventions

- Notebook of resource materials
  - Assessment Forms
  - Written Standard Operating Procedures
  - Documentation Forms
  - Sample HACCP plan
  - 8-lesson HACCP training materials
- Monthly Lesson Plans
- Contests—"name the project" and lesson plan

Resource Interventions, cont.

- Employee Orientation Materials
  - Full-color brochure
  - Written SOP
  - Orientation Checklist
- Iowa State University web site:

  www. schoolhaccp.org
- Provide on-site technical assistance

Mentoring

- Project staff
- Extension Nutrition & Health Field Specialists
- Project participants

Employee Characteristics

Characteristic	Pretest N=308	Posttest N=301
Years in foodservice		
5 years or less	147(48%)	130(43%)
6-15 years	93(30%)	105(35%)
16-25 years	50(16%)	48(16%)
more than 25 years	16(5%)	17(6%)
Food safety certification		
No	190(62%)	189(63%)
Yes	110(36%)	107(36%)
Position		
Manager	34(11%)	30(10%)
Cook	132(43%)	150(50%)
Foodservice Assistant/Other	137(44%)	119(40%)

Employee Knowledge

Pretest

- Mean Score: 15.9±2.4 (20 possible)
- Low Score: 8
- High Score: 20

Posttest

- Mean Score: 16.7±2.7 (20 possible)
- Low Score: 2
- High Score: 20

Common Food Handling Problems Observed at Initial Visit

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

Common Food Handling Problems Observed at Initial Visit, 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 at Initial Visit, 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

Food Safety Practices Score

- No. YES observations ÷ no. YES observations + no. NO observations
- Pretest 67.5 ± 14.4
- Posttest 87.0 ± 9.7

Food Handling Practices Most Improved

- Food temperature documentation
- Equipment temperature documentation (refrigerators, freezers, milk coolers, dish machines)
- Employee knowledge of temperatures
- Thermometer calibration

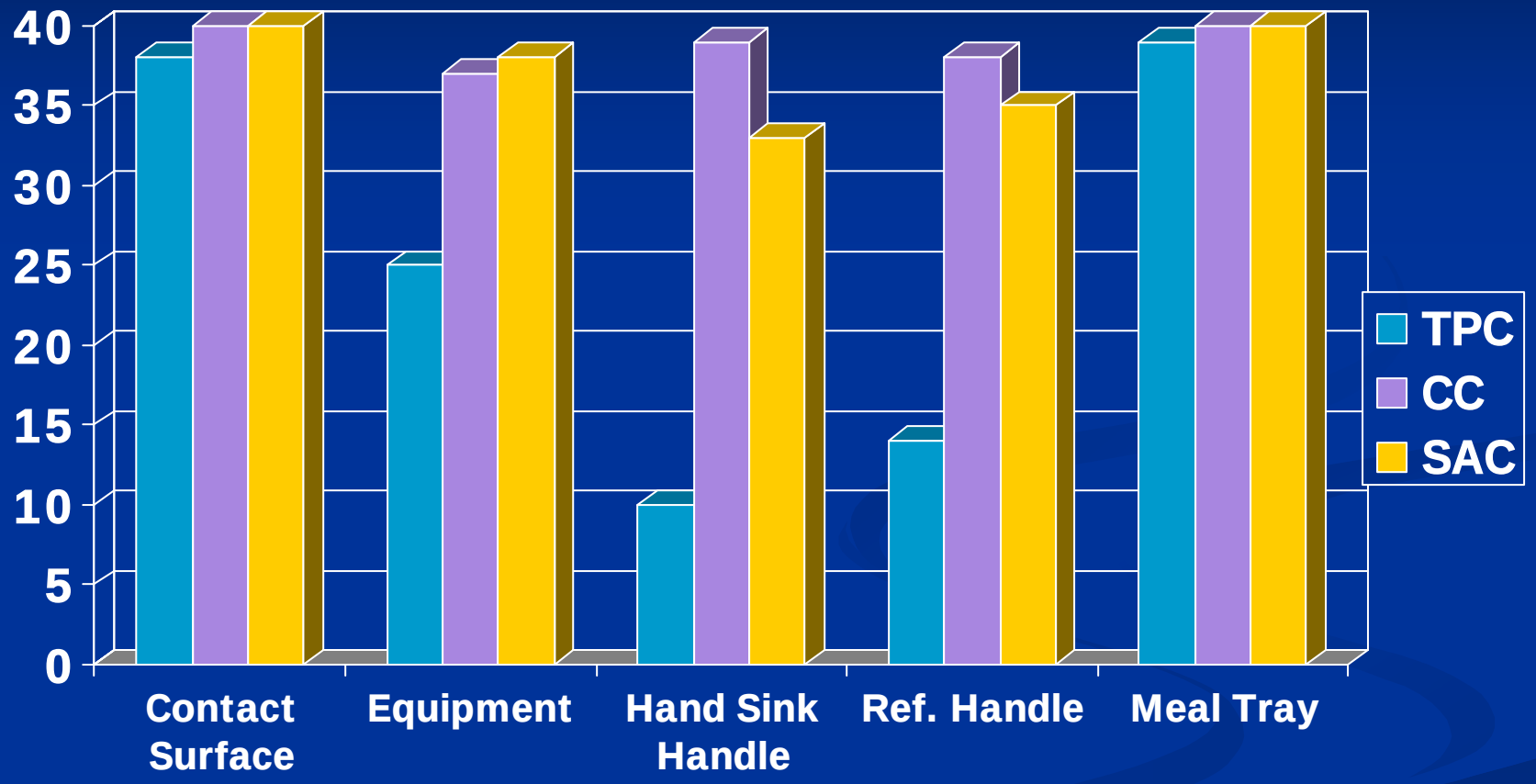
Microbiological Tests

- Food Contact Surfaces
  - Work counter
  - Equipment (mixing bowl, steam-jacketed kettle)
  - Hand sink handle
  - Refrigerator or Freezer Handle
  - Tray (pretest)
  - Cutting Board (posttest)

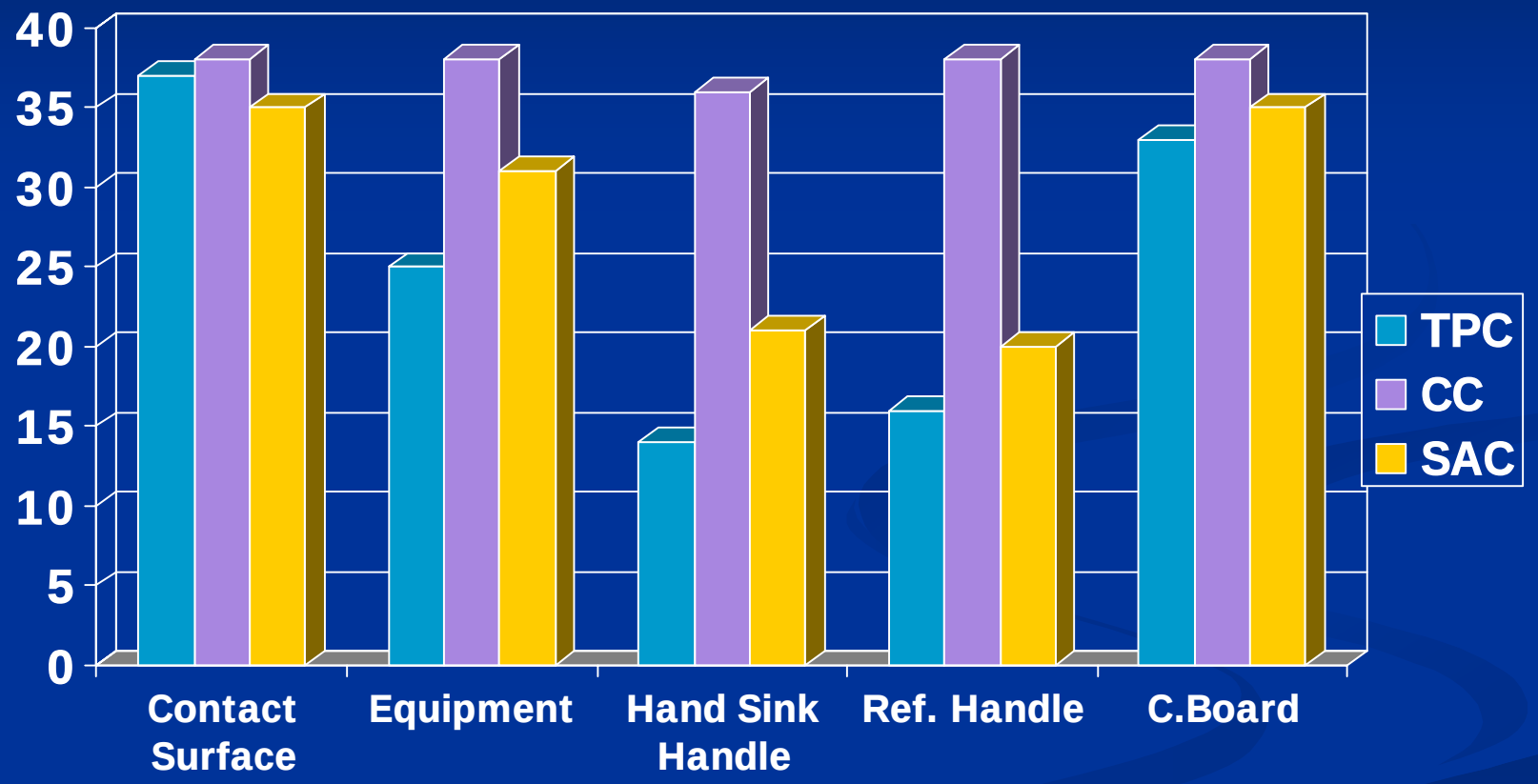
Standards for Retail Foodservice Established

- $\log_{10}$CFU/cm^2 for flat surfaces; $\log_{10}$CFU/unit for non-flat surfaces
- <1.3 for Aerobic Plate Count
- <1.0 for *Enterobacteriaceae*
- <1.0 for *Staphylococcus aureus*

Microbiological Study, Pretest (No. meeting standard) (N=40)



Microbiological Study, Posttest (No. meeting standard) (N=38)



Usefulness of Initial Site Visit Report (N= 33)

	Very Useful	Some Usefulness	Did Not Use
Observations/ Recommendations	24	6	
Microbiological Results	24	6	
Employee Knowledge Test Results	18	11	1

School Foodservice Managers' Reported Documentation (N=33)

	YES	NO
End-point cooking temperatures	33	0
Refrigerator temperatures	31	2
Freezer temperatures	31	2
Calibration of thermometers	31	2
Dishwasher sanitation	31	2
Service temperatures	30	3
Milk cooler temperatures	29	3
Sanitizer concentration	25	8

Training Materials Rated Very Useful (N=33)

Written Standard Operating (SOP) Procedures	24
Documentation Forms	24
SOP Checklist	22
Sample HACCP Plan	14
Prerequisite Program Checklist	11
CD with Resources	10
Food Flow Charts	9
Orientation Brochure and Website	7

Training Rated as Very Useful (N=33)

- ServSafe 29
- HACCP I 24
- HACCP II 22

One district did not use ServSafe training, one did not use HACCP I training, and two did not use HACCP II training.

Usefulness of Sources of Mentoring (N=33)

	Very	Some	Not	Not Used
Project staff	27	5		2
ISU Extension Specialists	12	11		9
Other Managers in project	1	13	3	15
ISU Food Safety website	3	12		18

National Impact

- Child Nutrition & WIC Reauthorization of 2004 requires a food safety program based on HACCP principles in schools
- Website widely used
- National and state workshops

Coordinate Efforts with Related Agencies

- Bureau of Food and Nutrition staff
- ISU Cooperative extension nutrition and health field specialists
- Department of Inspections and Appeals
- National Food Service Management Institute
- School Nutrition Association/Child Nutrition Foundation