The Center of Excellence for
FOOD SAFETY RESEARCH IN
CHILD NUTRITION PROGRAMS

STATUS OF FOOD SAFETY PROGRAMS IN SCHOOL FOODSERVICE OPERATIONS

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Introduction

Child Nutrition Programs are offered in over 101,000 school districts, providing over 10 million children with breakfast and 31 million with lunch daily. Food safety is a major concern for all stakeholders.

Congress added specific food safety requirements in the Child Nutrition and WIC Reauthorization Act of 2004 in an effort to improve the safety of school meals. Each school was required to implement a food safety program based on hazard analysis and critical control point principles (HACCP).

In 2005, *Guidance for School Food Authorities: Developing a School Food Safety Program Based on the Process Approach to HACCP Principles* was developed by USDA to assist school districts in implementing a food safety program. There has been no research conducted to determine how schools have implemented food safety programs.

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Purpose

The purpose of this study was to determine how school districts have implemented food safety programs based on HACCP principles.

Methodology

- A mega district (≥40,000 students) was randomly selected in each of the seven USDA Regions.
- A convenience sample of four other districts within 50 miles of the mega districts was selected and recruited.
- The final sample included 34 schools from 11 small districts (<2,500 students), nine medium districts (2,500-19,999 students), six large districts (20,000-39,999 students), and eight mega districts.
- Six researchers conducted on-site observations at one school in each of 34 school districts.
- To assure inter-rater reliability, extensive pilot testing was conducted and results were discussed after each observation until researchers were in agreement.

Results

- The majority of schools (n=28) used the Process Approach to HACCP and had a conventional food production system (n=20).
- The majority of schools had standard operating procedures (SOPs) in place for cooking potentially hazardous food (PHF) (n=28), cooling PHF (n=25), and holding hot and cold PHF (n=30).
- Most schools did not have a procedure in place for handling a food recall (n=17) or using time as a control (n=21).
- While many schools had SOPs delineated in the HACCP plan, there was a disconnect between HACCP plan content and documented actions.
- State-wide plans were seldom customized to meet the needs of a specific school.

Conclusions

- These data illuminate areas for improvements in food safety plans.
- Directors and supervisors may benchmark their operations to a larger national sample and use these results to build educational programs for directors, managers, and employees.

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EMPLOYEE HANDWASHING PRACTICES IN SCHOOL FOODSERVICE OPERATIONS

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Introduction

- Personal hygiene and handwashing are among the top five factors related to foodborne illness outbreaks in foodservice establishments (FDA, 2000, 2004, 2009; Harrington, 1992).
- The FDA found that elementary school employees practice proper, adequate handwashing in 72.5% of observations and prevented hands from contamination in 91.4% of observations (FDA, 2009).
- The Centers for Disease Control and Prevention recommends that handwashing lasts at least 20 seconds with clean, running water, soap, and means of drying (clean towels or an air dryer) (FDA, 2009).
- Handwashing limits the spread of highly contagious diseases in schools, yet there has been limited research exploring actual behavior of school foodservice employees.

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Purpose

The purpose of this research was to assess the handwashing practices of employees in school foodservice operations.

Methodology

- A convenience sample of 34 districts were selected and recruited. Districts in each of the seven USDA regions were represented.
- The sample included:
  - 11 small districts (<2,500 students)
  - 9 medium districts (2,500-19,999)
  - 6 large districts (20,000-39,999 students)
  - 8 mega districts (≥40,000)
- Six researchers conducted on-site observations of employee handwashing practices at one randomly-selected school in each of the 34 districts.
- To assure inter-rater reliability, extensive pilot testing was conducted and results were discussed after each observation until researchers were in agreement.

Results

- A total of 585 occasions when handwashing was required were observed and recorded.
- The majority of employees engaged in some handwashing prior to food preparation, but many times the handwashing was done improperly.
- Employees washed hands properly in only 21% of occasions when handwashing was required.
- Employees washed hands well between handling raw animal products and ready to eat foods, although little raw animal products were handled.
- The handwashing practice with the highest out-of-compliance percentage (81%) was handwashing after touching body parts, coughing/sneezing, blowing nose, or eating and drinking.

Conclusions

- Handwashing practices need to be improved.
- Emphasis should be given to proper handwashing techniques.
- These results will assist school foodservice directors in benchmarking their employee practices and will serve as a reminder to encourage handwashing.

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RESTROOM HANDWASHING FACILITIES IN PROXIMITY TO SCHOOL CAFETERIAS

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Introduction

- Hand contamination is often associated with pathogenic transfer and subsequent widespread infections (Lee & Greig, 2010).
- Effective handwashing is paramount to a school's health and food safety program and key to preventing illnesses.
- Simple barriers such as broken faucets or lack of hand washing supplies may inhibit hand hygiene (Master, Longe, & Dickson, 1997).
- The design of handwashing and drying equipment, such as manually-operated devices, may contribute to the spread of illnesses among children (Bright, Boone, & Gerba, 2010).

Purpose

The purpose of this study was to assess a national sample of handwashing facilities near school cafeterias.

Methodology

- Six researchers observed 60 male and female bathroom facilities located in 34 school districts.
- Researchers documented the number of hand sinks, functioning soap and sanitizer dispensers, and hand drying devices.
- Soap and sanitizer dispensers with and without available product were documented, including functioning automatic vs. manually-operated air dryers and faucets.
- Running water temperatures at hand sinks were gathered at 10- and 60-second intervals.
- Visible cues and signage for handwashing were noted.
- Restroom entryways were assessed if hand contact for entry or exit was required (e.g. handles, knobs, or push plates).

Results

- One functioning hand sink and soap dispenser was observed in all facilities.
- Most (n=55) soap dispensers contained product, while five did not.
- Only three facilities provided hand sanitizer.
- Most sinks (n=44) had manually-operated faucets.
- Ten second water temperature reading: 56ºF to 112ºF (M = 80.8 ºF ± 14.4 ºF)
- Sixty second water temperature reading: 57ºF to 135ºF (M = 88.4 ºF ± 19.2 ºF)
- Paper towels were available in 46 bathrooms and air dryers in nine. Three bathrooms had no form of hand drying available.
- Handwashing signs were observed in only 16 bathrooms.

Conclusions

- Opportunities exist to improve conditions in school restroom facilities to encourage handwashing.
- Directors and school personnel can use these findings to evaluate their facilities and develop possible interventions.

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HACCP Programs in School Foodservice Operations

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Introduction

- Approximately 48 million cases of foodborne illness occur annually in the U.S., yielding 128,000 hospitalizations and 3,000 deaths (Scallan et al., 2011).
- Young children are highly susceptible to foodborne illnesses.
- Schools serve an estimated 32 million meals daily through the National School Lunch Program (USDA, 2011).
- In the 2004 Child Nutrition and WIC Reauthorization Act, Congress mandated schools to adopt a food safety program based on Hazard Analysis Critical Control Point (HACCP) principles.
- To-date, no studies have validated the effectiveness of these programs.

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Purpose & Objectives

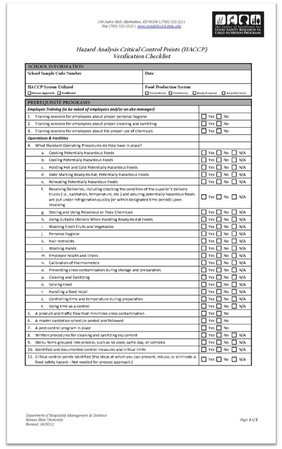
- The purpose of this study was to assess the status and effectiveness of HACCP implementation in schools since the 2004 Child Nutrition and Reauthorization Act.
- Specific objectives include:
  - Identify which components of the HACCP system and prerequisite programs have been implemented.
  - Determine specific challenges and barriers school foodservice directors and employees experienced in implementing and maintaining their HACCP plan.
  - Determine the relationships between HACCP program implementation and actual food safety behaviors.

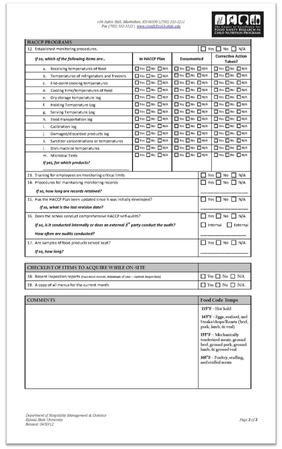
Methodology

- Schools will be categorized based on total enrollment:
  - Small (< 2,500 students)
  - Medium (2,500 - 19,999 students)
  - Large (20,000 – 44,999 students)
  - Mega (> 45,000 students)
- One state from each of the USDA seven regions will be selected.
- Within each state, the largest mega school district will be chosen. A large, medium, and small district will then be randomly chosen within a 200 miles radius of each mega district (n=35 schools).

Methodology, Continued

- Within each district, one school will be randomly chosen to participate in the study.
- Trained researchers will visit each school to conduct a HACCP inspection.
- A HACCP Verification Checklist will be utilized to conduct the inspections.


Hazard Analysis Critical Control Points (HACCP) Verification Checklist



- SPSS will be utilized to calculate descriptive statistics and correlations.

Conclusions & Applications

- Validating the effectiveness of HACCP implementation and assessing the potential gaps between practices and requirements will identify changes needed in USDA food safety and HACCP guidelines and training.
- Regulatory agencies can use this data to determine HACCP implementation needs in other segments of the industry.