Food Safety for Special Education
High School and Transition Students

In-Service Teacher Training

Project Funded by CSREES/USDA Project 2005-5111003275
Food Safety Education:
Special Education High School and Transition Students

- 4 year, USDA funded project
- 3 New England states
  - Rhode Island
  - Connecticut
  - Massachusetts
- Research, Outreach and Education
Objective of Program

- Find out what teachers know about food safety
- Develop food safety curriculum and other resource materials
- In-service
- Pilot program
- Education modules for college undergraduate/graduate programs for special education teachers
Survey of Teachers of Special Needs Students

- What are the results?
  - Knowledge and Needs
- What do we know?
- What does it mean?
Survey Respondents N=220

- CT (33%), RI (20%), MA (47%)
- Primary certification
  - Special education 69%
  - FCS 15%
  - General Education 5%
  - Vo/Tech 5%
  - Other 6%
Food in the Classroom

Food served in the classroom as part of the learning experience?

Yes – 86%
Types of Food Prepared/Served in the Classroom

6% Not Potentially Hazardous Foods

94% Potentially Hazardous Foods (supports growth of harmful microorganisms)

- chicken, beef, turkey dinner, fish, eggs
- stir fry
- lasagna
- deli sandwiches
- hot dogs
- salad bar, cut veggies & fruit
- soups & stews
- crock pot dishes
- homemade ice cream, pudding
Teaching Food Safety as Part of Life Skills?

- Yes - 80% (N=173)
- Training?
  - Yes – variety of methods
    - undergraduate
    - graduate
    - on-line
    - professional development
  - No formal training - 61%
Curriculum Audit

- Only 41% of those teaching food safety indicated sources of information
- Creating own materials from
  - websites
  - food service curriculum (e.g. ServeSafe)
  - cookbooks
  - lifeskills curriculum
  - outreach specialists
  - media/newspapers
- No food safety curriculum designed targeting special needs students
What does this mean?

Majority of teachers that worked with high school or transition special education students:

- served food in the classroom as part of the learning experience
- had no formal training in food safety
- did not reach mastery for food safety knowledge – particularly with cooking and chilling/storage.
What does this mean?

There was a strong level of agreement among teachers that:

- Food safety skills were important to students
- Food safety was relevant to the students
- Food safety was important to a life skills curriculum
- Students had responsibility in keeping food safe
- Food safety was important to teach
- But.........

No curriculum or resource materials developed that target this audience !!!
Food Safety Education for Special Needs Students

Curriculum and Resources for Teachers of High School and Transition Special Needs Students
Food Safety Review: The Microworld
You won’t spot unsafe food by using your senses.

Sight

Smell

Taste

From: http://lancaster.unl.edu/food/pizza.shtml
Foodborne Illness: Symptoms

- Nausea
- Vomiting
- Diarrhea
- Headache
- Fever

A “tiny taste” will not protect you ...

... as few as 10-100 bacteria could make you sick!
Foodborne Illness: People at Greatest Risk

- Infants & Children
- Pregnant women
- Elderly
- People with weakened immune systems
Foodborne Illness: Dangers

- **Cases:** 76 million per year
- **Hospital:** 325,000 per year
- **Deaths:** 5,000 per year
- **Cost:** $10-83 billion per year

Foodborne Illness: Most likely sources

- Potentially Hazardous Foods
- Ready to Eat Foods
Foodborne Illness: Food Safety Hazards:

Physical
- Plastic
- Glass
- Metal
- Wood
- Bandages
- Jewelry and other personal items

Chemical
- Allergens
- Pesticides
- Sanitizers
- Lubricants

Biological
- Parasites
- Viruses
- Bacteria
Biological Food Safety Hazards: What are the differences?

- Parasites
- Viruses
- Bacteria

Cryptosporidium parvum
Salmonella spp.
Norwalk virus
Sources of Biological Contamination

- Animals
- People
- Environment
Source of harmful bacteria/viruses

Animal/human intestinal tract
- *Salmonella*
- *E. coli O157:H7*

Human
- *Shigella*
- *Hepatitis A virus*
- *Norovirus*
- *Staphylococcus*

Environment
- *Listeria*
- *Clostridium*
- *E. coli O157:H7*

Water
- Most of the above
To Grow, Bacteria Need:

- Food
- Moisture
- Low in acidity (high pH)
- Oxygen
- Time to grow
- Correct temperature

Not all bacteria are created equal - different bacteria have different requirements.
Food

- Protein
- Minerals
- Vitamins
- Everything we eat
Moisture

Water Activity

Minimum needed for bacteria to grow

Fruits and vegetables

Potentially Hazardous Foods

Dry Egg Noodles Crackers
Flours Candy
Jams & Jellies
Meats Poultry
Distilled Water

0 0.1 0.2 0.3 0.4 0.5 0.6 0.67 0.7 0.75 0.8 0.85 0.9 0.92 0.95 0.98 1.0
Acidity levels affect bacterial growth

Different bacteria, different acid tolerance
Oxygen

- Three groups of bacteria
  - Some must have oxygen to grow
  - Some can grow with or without oxygen
  - Some can only grow without oxygen

- Many harmful bacteria “swing” either way
The Right Temperature

“Danger Zone”

140 °F

40 °F
Time and Temperature

Number of Salmonella per gram

Days

0 1 2 3 4 5

95°F

50°F

44°F

42°F
How do bacteria grow?

- If the right conditions exist, bacteria will grow very quickly – **doubling every 20 minutes or faster**.
- One bacteria can multiply to more than 30,000 in 5 hours or millions in just 8 hours.
Food Safety Review: Be Food Safety Smart

Food safety practices to reduce the risk of foodborne illness
Be Food Safety Smart - Clean

- Pathogenic or harmful bacteria can spread throughout the kitchen and get on hands, cutting boards, knives and countertops.
- Frequent cleaning can keep that from happening.
Be Food Safety Smart - Clean

Good personal hygiene is essential for anyone who prepares food.
Be Food Safety Smart - Clean

Wash hands whenever they have become contaminated, including:

- Before handling food
- After using the bathroom
- Between tasks
- After eating or drinking.
Be Food Safety Smart - Clean

WASH hands with warm water and soap for 20 seconds before and after handling food
Be Food Safety Smart—Clean

**WASH** preparation utensils/equipment:

- in hot soapy water and rinse with hot water
- or wash in the dishwasher
- after preparing each food item and before you use it for the next food.
Be Food Safety Smart - Clean

**WASH** countertops with hot soapy water and **rinse** after preparing each food item and **before** preparing the next food.
Be Food Safety Smart - Clean

**RINSE** fruits and vegetables under cool running tap water, including those with skins and rinds that are not eaten.

**SCRUB** fruits with rinds with a brush under cooling running water.
Be Food Safety Smart

Keep it Hot,
Keep it Cold,
or
Don’t Keep It!!!
Be Food Safety Smart- Cook

Thorough **cooking** and reheating food to the right temperature is essential to destroy harmful microorganisms that could cause foodborne illness.
Be Food Safety Smart - Cook

Keeping foods above 140°F will:
- Prevent growth of microorganisms
- Destroy microorganisms

Keeping foods below 40°F will:
- Prevent or slow the growth of bacteria.
Be Food Safety Smart - Cook

Food has potential to cause illness if:

- It is exposed to temperatures in the danger zone 40°F-140°F for more than 2 hours

- It is not cooked or reheated sufficiently to destroy harmful microorganisms.
Be Food Safety Smart - Cook

Food is **SAFELY COOKED** when it reaches a high enough internal temperature killing the pathogenic bacteria that causes illness.
Be Food Safety Smart - Cook

Using a food thermometer is the only way to insure that food is thoroughly cooked.
Be Food Safety Smart - Cook

The range of safe cooking temperatures can vary from:

145°F to 165°F
Be Food Safety Smart - Cook

Safe Cooking Temperatures

- Ground Meat & Meat Mixtures  160°F
- Poultry (Chicken & Turkey)  165°F
- Egg Dishes  160°F
- Fish  145°F
- Casseroles and Leftovers  165°F
Be Food Safety Smart - Cook

ROTATE and STIR food cooked in the microwave due to cold spots
Be Food Safety Smart- Chill

- Pathogenic bacteria multiplies rapidly at temperatures between 40°F and 140°F

- Keeping certain foods cold is the most effective way to reduce the risk of foodborne illness.
Pass foods through the temperature danger zone quickly and as few times as possible!
Be Food Safety Smart - Chill

**CHILL** leftovers and takeout foods within 2 hours.

**KEEP** the refrigerator at 40°F or below and use an appliance thermometer.
Be Food Safety Smart - Chill

- The temperature of a home refrigerator should be 40°F.
- Place a thermometer on a middle shelf at the rear of the unit.
- Check often.
Be Food Safety Smart - Chill

THAW frozen meat, poultry, and seafood in the refrigerator always on a shelf below fresh produce.
Be Food Safety Smart - Chill

Other ways to thaw:

Submerged under cool running water

In a microwave

As part of the cooking process
How long would it take to cool this large stockpot of thick beef stew in a refrigerator at 40°F?
Be Food Safety Smart - Chill

It would take 6 days to cool the beef stew in this large pot to 40°F!
Be Food Safety Smart - Separate

Cross contamination occurs when pathogenic bacteria are passed from one food or object to another.
For example, when tomatoes are cut on the same cutting board as raw chicken without the cutting board being properly cleaned, cross contamination occurs.
Be Food Safety Smart: Separate

Harmful bacteria can be transferred by:

- People
- Equipment
- Utensils
- Other foods
- Pests

RAW READY-TO-EAT
Be Food Safety Smart - Separate

**WASH** cutting boards, dishes, utensils, and counter tops with hot soapy water after preparing each food item and before you go on to the next food.

**USE** one cutting board for raw meat, poultry and seafood and another for salads and ready-to-eat food.

**STORE** raw meat, poultry, and seafood in a container or on a plate so juices can't drip on other foods.
Be Food Safety Smart - Separate

When shopping, keep raw meat, poultry, seafood and their juices apart from other, ready to eat, or unpackaged food items in your grocery cart.
Be Food Safety Smart

Using the Food Safety Smart Curriculum and Its Resources to Teach Food Safety Education
What do we give to you?

- Curriculum with activities and resources
- **DVD containing:**
  - 15 minute video
  - photofile for home food safety
  - illustration of microbial growth Power Point
  - curriculum package
  - interactive Power Point activity
  - teacher in-service PowerPoint
  - foodservice application PowerPoint
- All evaluation forms, letters and pre/post test score sheets
- Food safety practices observational assessment
Food Safety Smart Curriculum Resources

**Food Safety Education for High School and Transition Special Needs Students**

**Food Safety Smart Curriculum**

* Rhode Island Cooperative Extension provides equal program opportunities.

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Using the Curriculum

- How is it set up?
- What are the activities?
  - With kitchen access
  - Without kitchen access
- Evaluation
  - of program?
  - of student progress?
- Video and Photofile
  - Integration into the curriculum
Food Safety Smart Curriculum Content

Section I- Description of Universal Design

Section II- How to Use the Curriculum
   A. Curriculum Design
   B. Application for Special Needs Students

Section III- Curriculum Pretest

Section IV- Teaching Units/Student Activities

Appendices
Food Safety Smart: Teaching Units

Unit 1 – Introducing Students to Food Safety
- Food Safety Survey
- Parent/Caregiver Information

Unit 2 - The Microworld

Unit 3 - FightBAC Principle: Clean

Unit 4 - FightBAC Principle: Separate

Unit 5 - FightBAC Principle: Cook

Unit 6 - FightBAC Principle: Chill

Unit 7 - Putting It All Together
- Survey (Unit 1) evaluation
- Food preparation activity – planning to preparing
Food Safety Smart Curriculum Content - Lesson Content

- Introduction
- Lesson Outcomes
- Essential Vocabulary
- Teaching Points
  - Opening Question
  - Notes
- “Learn More About”
- Student Activities
  - Located at the end of each unit
- Unit Post test: Units 2 – 6 only
- Student Reflection
Student Activities

Demonstration of Student Activities
Resources for Illustrations

1. International Association for Food Protection
   http://www.foodprotection.org/aboutIAFP/SafetyIcons.asp

2. National Registry of Food Safety Professionals, Essentials of Food Safety & Sanitation, 2004