Results of a Food Safety Intervention Study

December 3, 2014
Washington, DC
The Team …

Colorado

Kendall

Sofos

Ohio

Baker

Scharff

LeJeune

Medeiros

Healthy Baby
Healthy Me
US Department of Agriculture
National Integrated Food Safety Initiative
Grant # 2006-51110-03663
When and where was the study done?

- Colorado and Ohio
- The Expanded Food and Nutrition Education Program (EFNEP)
- Para-professional Educators
- 2007 to 2011
The Intervention
\( n=550 \)

**Ohio**
- English
  - Enhanced \( n=69 \)
  - Usual \( n=55 \)
- Spanish
  - Enhanced \( n=69 \)
  - Usual \( n=59 \)

**Colorado**
- English
  - Enhanced \( n=102 \)
  - Usual \( n=74 \)
- Spanish
  - Enhanced \( n=72 \)
  - Usual \( n=50 \)

Educational and Microbiological Pre- and Post-Evaluation

Healthy Baby Healthy Me
Healthy Baby, Healthy Me Food Safety Curriculum

Pregnancy and Foodborne Illness

You and your baby could be at risk for foodborne illness

Healthy Baby, Healthy Me
Why EFNEP?

- National nutrition education program for low income women
- Fight Bac! food safety education included
- Educational curriculum very adaptable
The Eating Smart, Being Active Lessons

• Get Moving!
• Plan, Shop, Save
• Fruits & Veggies: Half Your Plate
• Make Half Your Grains Whole
• Build Strong Bones
• Go Lean With Protein
• Make a Change
• Celebrate! Eat Smart & Be Active
Each lesson contains ...

- Welcome
- Anchor
- Add
- Apply
- Being active
- Let’s taste it!
- Review
- Away
Development of HBHM Control

- Removed physical activity
- Replaced segment with pregnancy-specific information
  - Regular health care, appropriate weight gain
  - Healthy eating during pregnancy
  - Things to avoid during pregnancy
  - Handling common pregnancy discomforts
Why Focus on Pregnant Women?

- Higher risk due to down-regulation of cellular immune system to support fetus
- Increased susceptibility of pregnant woman and her fetus to intracellular pathogens
- Information seekers
- Better life for my child
Food Handling Behaviors of Special Importance to Pregnant Women

- Avoid eating soft cheeses, cold smoked fish, & cold deli salads
- Avoid eating hot dogs & deli meats that have not been reheated to steaming hot or 165°F
- Use cheese & yogurt made from pasteurized milk
- Avoid eating foods containing raw eggs & cook eggs until firm
- Do not clean cat litter boxes
- Do not handle pets when preparing food

J Am Diet Assoc. 2003, 103, 1646-1649
Why Low Income, English & Spanish-speaking?

- Low-income, limited resource women may not have good access to education (Trepka et al., 2006)
- Higher documented risk of listeriosis among Latina pregnant women and their infants than among their non-Latina counterparts, primarily due to food preferences (Lay et al., 2002)
Pathogens of Special Importance for Pregnant Women

- **Healthy Baby**
  - *Listeria monocytogenes*
  - *Toxoplasma gondii*

- **Healthy Me**
  - *Salmonella spp.*
  - *Campylobacter jejuni*
Queen Anne’s plight

- **Disease**
  - Flu-like symptoms, febrile diarrhea
  - Stillbirth, abortion, hydrocephalus

- **Risk Factors**
  - Raw milk/cheeses, lunch meat, environment

*Listeria monocytogenes*
The case of the crazy cat lady

• Disease
  – Flu-like symptoms, febrile diarrhea
  – Stillbirth, abortion, hydrocephalus

• Risk Factors
  – Contact with cat feces (litter box, garden)

Toxoplasma gondii
A ride in a shopping cart

• Disease
  – Abdominal pain, diarrhea (blood)
  – Autoimmune paralysis (Guillain-Barré)

• Risk Factors
  – Poultry, raw milk/cheeses
  – Travel, puppies, farm visits, shopping carts

Campylobacter jejuni
But infants don’t eat raw chicken...

- **Disease**
  - Abdominal cramps, diarrhea, fever
  - Septicemia, reactive arthritis

- **Risk Factor**
  - Runny eggs, raw milk/cheeses, meats
  - Environmental, pets, chicks, reptiles

*Salmonella species*
Next in the workshop….

Let’s look at a Healthy Baby, Healthy Me lesson
Make Half Your Grains Whole

... and Keep it Clean
Make Half Your Grains Whole

Foods made from grains

1 slice bread
1/2 cup cooked pasta
1 cup ready-to-eat cereal
1/2 cup cooked rice
3 cups popcorn
5–7 crackers
1 tortilla (6-inch)
Whole Grain

Endosperm (carbohydrate)

Germ (vitamins & minerals)

Bran (fiber)

Refining process

Bran & Germ removed (fiber, vitamins & minerals lost)

Endosperm (carbohydrate)

Refined Grain
Reading Grain Labels

Product name/description

Fiber

Ingredient list
Toxo
(Toxoplasma gondii)

How can I get Toxo?

Toxo can be found on…
- Raw meats, especially pork, lamb, and deer
- In cat feces, or soil or water contaminated with cat feces

You can get Toxo…
- By touching hands to your mouth after handling undercooked meats or cat feces
- From knives, utensils and cutting board that have touched raw meat

Risk to Pregnant Women?
- If exposed to Toxo during or shortly before pregnancy, may pass it to your unborn baby.
Toxo

Signs of Toxo infection?

- Swollen glands
- Fever
- Headache
- Muscle pain
- Possibly stiff neck

What can I do to prevent Toxo?

- Separate raw meat from other foods:
  - In shopping cart,
  - In refrigerator,
  - While preparing and handling foods
- Keep hands and kitchen clean
- Cook meats thoroughly
4-Step Hand Washing Method

1. Wet hands with WARM water.
2. Soap up and scrub for 20 seconds using nail brush under nails.
3. Rinse under clean, running water.
4. Dry completely using a clean cloth or paper towel.

Always Wash Hands:

- Before handling food
- After handling food
- After using the bathroom
- After changing a diaper
- After tending to a sick person
- After blowing your nose, coughing, or sneezing
- After handling pets
Hand Washing

Regular hand soap works as well as antibacterial soaps

- Both remove germs and dirt.
- Key is lather and friction to remove germs, grease, and dirt.
- Compare cost – antibacterial soap may cost more.

Hand gel sanitizers:

- Don’t get rid of grease or dirt.
- Do kill germs and work best on clean hands.
- Good to use when water not available.
What if you have a cat?

- Have someone else change litter box daily.
  - If you must clean it, wear disposable gloves and wash hands afterwards.
- Wear gloves when gardening or working in sandbox. Wash hands afterwards.
- Cover outdoor sandboxes.
- Feed cat commercial dry or canned food, never raw meat.
- Keep indoor cats in, outdoor cats out!
- Avoid stray cats and don't get a new cat while pregnant.
A Cross-contamination activity …

AN INTERACTIVE DEMONSTRATION WITH PETRI FILMS
Petrifilm™ Experiment

Unwashed Kitchen Counter

Kitchen Counter Washed with Soap and Water, then Sprayed with Home Sanitizer.

Unwashed

Soap and Water

Kitchen Counter Washed with Soap and Water and Dried with Paper Towel.

Soapy Water + Homemade Sanitizer

Soapy Water + Store-Bought Sanitizer

Kitchen Counter Washed with Soap and Water, then Sprayed with Commercial Sanitizer.
Next in the workshop....

AN OPEN DISCUSSION WITH SUSAN, PAT, LYDIA AND JEFF
IMAGES OF TOXOPLASMOSIS GONDII

Toxo in cat feces

Toxo in brain tissue

Toxo in the body before getting into the muscle, brain, or eyes

Toxo in the eye
**HOW CAN TOXO AFFECT MY BABY?**

If a Toxo infection occurs later in pregnancy, you may not miscarry, but the baby could be affected.

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**SIGNS OF A TOXO INFECTION**

Symptoms include:
- Fever
- Headache
- Rash
- Weakness (tiredness)
- Swollen glands

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*Healthy Baby Healthy Me*
WHAT IF YOU HAVE A CAT?

- Have someone else change the litter box daily

Note: If you have a cat and are concerned about exposure to Toxo, talk to your health-care provider and your veterinarian.
MORE TIPS TO PREVENT TOXO

- Frequent handwashing is one of the best ways to prevent Toxo

CLEAN

Keep cutting boards clean:
- Wash in hot soapy water after each use
- Rinse with clean water
- Air dry or wipe with a clean paper towel
Next in the workshop:...

Adding Food Safety messages to other lessons
Lesson 3 …
Vary your Vegetables, Focus on Fruit.. and Have a Safe Pregnancy

• Why higher risk during pregnancy
• Danger zone, how germs multiply
• *Salmonella* – meats, but also veggies
• Safe choosing, handling of juices, fruits & veggies
• Using produce brush and cutting board
Lesson 5 …
Build Strong Bones.. and Keep Refrigerated Ready-to-Eat Foods Safe

- *Listeria*: Why pregnant women & unborn babies at higher risk
- What to look for on labels to reduce risk of *Listeria*.
- How to keep refrigerator clean and at safe temperature.
- Activities: Use refrigerator thermometer, read labels
Lesson 6 …

Go Lean with Protein

Food Safety in Control & Enhanced

- Eating fish while pregnant
- Danger zone, how germs multiply – Control
- *Campylobacter* – Enhanced
- Fight Bac! – Clean, Separate, Cook, Chill
- Activity: calibrate thermometer, use to test temperature of cold, warm and hot water
- Control – stem; Enhanced – digital
Next in the workshop…

Developing the Evaluation
**Healthy Baby Healthy Me Pre Survey**

This is not a test, and there are no wrong answers. Please circle the best response.

<table>
<thead>
<tr>
<th>Question</th>
<th>Nothing</th>
<th>A Little</th>
<th>A Lot</th>
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</thead>
<tbody>
<tr>
<td>1. How much have you heard about the bacteria <em>Salmonella</em>?</td>
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<tr>
<td>2. How much have you heard about the bacteria <em>Listeria</em>?</td>
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<td>3. How much have you heard about the parasite <em>Toxoplasma gondii</em> (Toxo)?</td>
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<td>4. How much have you heard about the bacteria <em>Campylobacter</em> (Campy)?</td>
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<td>5. During pregnancy, I’m at a higher risk of getting an infection caused by <em>Listeria</em>.</td>
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<tr>
<td>6. During pregnancy, I’m at a higher risk of getting a foodborne illness caused by <em>Toxoplasma gondii</em> (Toxo)</td>
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<tr>
<td>7. Using the same cutting board to cut up raw chicken and then cut raw vegetables for a salad is safe as long as you wipe the board off with a clean cloth between the different foods.</td>
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<td>8. If you use a dishcloth to wipe up liquid from meat or chicken, you can safely continue to use the cloth for washing dishes if you rinse the dishcloth in warm water.</td>
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<tr>
<td>9. When you can’t see the little pink, the hamburger is cooked.</td>
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<td>10. It’s safe to eat sliced meat even if you don’t see any pink.</td>
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How were the items developed and tested?
How was the evaluation implemented?

- Home visits (pre-education and post-education)
  - Self-reported food safety knowledge and behavior
  - Observed kitchen cleanliness and internal refrigerator temperatures measured
  - Microbiological samples collected
Evaluating an Food Safety Education Program with …

MICROBIOLOGY!!!!!!
Microbial indicators of sanitation

- Aerobic (total) plate count: Environmental
- Coliforms: Environmental (soil), Gram-negative
- *E. coli*: Fecal origin
Break Time
3:15 to 3:30
Next in the workshop …

THE RESULTS.
WHAT DID WE FIND?
Our results are not yet published!

PLEASE LOOK FORWARD TO OUR FUTURE PUBLICATIONS.
OPEN DISCUSSION: WHAT LESSONS DID WE LEARN?
Healthy Baby, Healthy Me

*Lessons Learned* ...

**Target audience**

- Needs to be large enough to meet sample needs
- ✓ English and Spanish-speaking
- ✓ Low-income pregnant women in 1st-2nd trimester
- ✓ 18 years of age or older
Healthy Baby, Healthy Me

Lessons Learned ...

Development of Educational Protocol

✔ Educational protocol needs to be long enough to achieve behavioral change, yet short enough to minimize drop-out issues

✔ Intervention curriculum needs to be sufficiently different than Control

✔ Need systems in place to assure uniform delivery of control and intervention programs
Healthy Baby, Healthy Me

Lessons Learned ...

Project Implementation

✓ Strong agency support - reciprocal
✓ Convenient meeting places
✓ Child care and transportation issues addressed
✓ Consideration of family situations
✓ Consideration of potential safety issues
Healthy Baby, Healthy Me

Lessons Learned ...

Research vs Education Standards of Practice

✓ Educators need to understand importance of following research protocol
✓ IRB is your friend
✓ Debriefing strategies critical
  • Food safety handouts given to controls at post home visit
  • Protocols developed for informing participants if samples positive for Listeria or Salmonella
And... about the micro evaluation

ALTERNATIVE MICROBIOLOGICAL TOOLS
Thank you for coming today!

WORKSHOP EVALUATION
The End

Thanks for Coming Today!
template