The Need

- In 2001, Selman and Green surveyed local and state environmental health specialists (EHSs).
- They found that EHSs focus on the pathogen during outbreaks instead of contributing factors and their environmental antecedents.
- A lack of communication between epidemiologists and EHSs was found to be a barrier to the active engagement of EHSs in foodborne illness outbreak EAs.
- Local EHS staff require training because they are not involved in outbreaks often enough to attain competency in EAs.

Foodborne Illness Outbreak Environmental Assessment Training Challenges

- EHSs are accustomed to looking for violations of regulations, not contributing factors and their environmental antecedents
  - Performing an EA requires a different mindset than other environmental activities
- No two outbreaks are alike
  - No single “checklist” applies to all EAs
- Conducting an EA requires a complex set of knowledge and skills including the ability to apply “critical thinking”
- Training must promote development of competency in the field, not just the acquisition of knowledge
Goal of This Effort

Use cutting-edge e-learning technologies to develop competency with foodborne illness outbreak EAs and deliver training free of charge over the Internet to enhance global food safety.
Cutting-Edge Technology

- Used to make the training
  - Compelling
  - Engaging
  - Instructionally effective
Foodborne Illness Outbreak
Environmental Assessment

Training Home Page

About this training
Recommended prerequisites
Register for training
How to take training
Launch training
Register for participation in NVEAIS

Training Registration Page

- Name
- E-mail address
- Agency/organization
  - Federal
  - State
  - Local
  - Tribal
  - Territorial
  - Scientific
  - Consumer
  - Industry
  - Education
- Location
- Job title
  - Environmental health specialist
  - Epidemiologist
  - Laboratorian
  - Other

Captured data:
Progress and performance of each individual user and groups of users

Reports:
Results for each individual user and/or groups of users
Sorted by agency and organization, location, job title, etc.
Analysis of Learner Performance

Learner receives individualized feedback on

- **Interview effectiveness**
  - Did the learner choose the correct questions?

- **Interview efficiency**
  - Did the learner choose questions in the correct order?

- **Observation skills**
  - Did the learner find all of the important embedded clues in the environment?

- **Critical thinking**
  - Did the learner correctly identify contributing factors and environmental antecedents?
Total Open Ended Questions Asked: 260
Total Closed Ended Questions Asked: 176

Selected set of questions:

<table>
<thead>
<tr>
<th>Interview Question Category</th>
<th>Interview Question</th>
<th>Open/Closed</th>
<th>Question Effectiveness</th>
<th>Feedback</th>
<th># of Users Who Asked this Question</th>
<th>% of Users Who Asked this Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tasks Performed by this FW</td>
<td>Question 1a:</td>
<td>OPEN</td>
<td></td>
<td></td>
<td>20</td>
<td>91%</td>
</tr>
<tr>
<td></td>
<td>Thinking back about 5 days ago, what tasks did you perform?</td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Question 1b:</td>
<td>CLOSED</td>
<td></td>
<td></td>
<td>10</td>
<td>45%</td>
</tr>
<tr>
<td></td>
<td>Do you prepare any side dishes?</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Question 1c:</td>
<td>OPEN</td>
<td></td>
<td></td>
<td>6</td>
<td>27%</td>
</tr>
<tr>
<td></td>
<td>How did you cook the</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

It's important to begin by asking each food worker an open-ended question regarding the tasks they performed around the time people may have eaten food that made them sick. It helps focus subsequent questions. In this case, you discovered that this food worker plated the potatoes, which could be a potential source of Norovirus contamination. Additionally, neutral open-ended questions like this can also help put the food worker at ease and get him/her talking.

Also, the food worker's answer provides possible insight into an Economic environmental antecedent (e.g., the boss cut back on staff because money was tight).

This is an important question because it explores the extent of this worker's food handling responsibilities. Foods handled after cooking, like baked potatoes, or foods that are not cooked prior to eating, like green salads, are often involved in Norovirus outbreaks.

Although this is a close-ended question, it is appropriate because if the answer is yes, it will be easy to follow up with appropriate probes.

This open-ended question is good for gathering information about the food worker's cooking practices. However, cooking temperatures are not likely to be relevant in a Norovirus outbreak, so a more helpful question might focus on how often...
<table>
<thead>
<tr>
<th>Mastery Test Question</th>
<th>Type</th>
<th>Pre Test Question #</th>
<th>Pre Test Correct Responses</th>
<th>Pre Test Incorrect Responses</th>
<th>Pre Test Average % Correct</th>
<th>Mastery Test Correct Responses</th>
<th>Mastery Test Incorrect Responses</th>
<th>Mastery Test Average % Correct</th>
<th>Question Improvement %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify environmental antecedents</td>
<td>multiple choice</td>
<td>39</td>
<td>33</td>
<td>45</td>
<td>42%</td>
<td>15</td>
<td>5</td>
<td>75%</td>
<td>+33%</td>
</tr>
<tr>
<td>Question 13: &quot;Improper pH&quot; is an example of an environmental antecedent related to which internal system variable?</td>
<td>multiple choice</td>
<td>38</td>
<td>52</td>
<td>26</td>
<td>66%</td>
<td>20</td>
<td>0</td>
<td>100%</td>
<td>+34%</td>
</tr>
<tr>
<td>Choices: People</td>
<td>Processes</td>
<td>Foods</td>
<td>Equipment</td>
<td>Economics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Question 14: &quot;Inadequate supervision&quot; is an example of an environmental antecedent related to which internal system variable?</td>
<td>multiple choice</td>
<td>37</td>
<td>26</td>
<td>52</td>
<td>33%</td>
<td>10</td>
<td>10</td>
<td>50%</td>
<td>+17%</td>
</tr>
<tr>
<td>Choices: People</td>
<td>Processes</td>
<td>Foods</td>
<td>Equipment</td>
<td>Economics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Question 15: The &quot;locavore&quot; trend (preference for dining which involves foods which are locally grown, processed and prepared) is an example of an environmental antecedent related to which internal system variable?</td>
<td>multiple choice</td>
<td>40</td>
<td>49</td>
<td>29</td>
<td>62%</td>
<td>19</td>
<td>1</td>
<td>95%</td>
<td>+33%</td>
</tr>
<tr>
<td>Choices: People</td>
<td>Processes</td>
<td>Foods</td>
<td>Equipment</td>
<td>Economics</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Management Reporting

- Number of users who have accessed training
- Number of users who have completed training
- Average test score
- Average time to complete training
- Breakdown of users by location, job title, etc.
Training Pilot

- Piloted with EHS-Net participants and partners = 51
  - 29% between 52 – 59
  - 19% between 51 – 42
  - 24% between 41-32
  - 19 % between 31 - 22

- Average time to complete = 8 hours
- Average pre-test score = 57%
- Average mastery test score = 90%

All data presented is for illustrative purposes only.
Training Pilot

- **Pilot participants**
  - 23 federal
  - 18 state
  - 3 local
  - 7 non-government

- **Job type identified**
  - 45% public health
  - 17% environmental health (not specifically w/ food safety)
  - 10% unemployed/student

All data presented is for illustrative purposes only
Foodborne Illness Outbreak Environmental Assessment Training

United States Inquires - 232
Number of states - 41

This data illustrates the number of inquiries received per state or country requesting participation in the e-Learning training.
<table>
<thead>
<tr>
<th>International Country Inquires - 15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Riyadh, Saudi Arabia - 3</td>
</tr>
<tr>
<td>Ihiaqwa-Owerri, Imo State, Nigeria - 1</td>
</tr>
<tr>
<td>Doha, Qatar - 1</td>
</tr>
<tr>
<td>Israel - 1</td>
</tr>
<tr>
<td>Nairobi, Kenya - 1</td>
</tr>
<tr>
<td>Germany - 1</td>
</tr>
<tr>
<td>Canada - 5</td>
</tr>
<tr>
<td>Serdang, Selangor, Malaysia - 2</td>
</tr>
<tr>
<td>South Sudan - 1</td>
</tr>
</tbody>
</table>
Development Team

- **Vendor Project Manager/Instructional Designer**
  - Marilyn Jones, MicroTraining & Associates

- **Subject-matter Experts**
  - Kristin Delea (CDC), Fred Angulo (CDC), Erik Coleman (CDC), Pam Wigington (CDC), Jack Guzewich (FDA), Chuck Higgins (NPS), Scott Seyes (USDA)

- **Cast of Voices and Characters**
  - From CDC
LET’S TAKE A TOUR!

http://www.microtrain.com/_cdc_training/login.asp
Environmental Justice at CDC/ATSDR

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The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.