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Food Safety Education and Disparities in North Carolina Emergency Food

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FOOD SAFETY EDUCATION AND DISPARITIES IN NORTH CAROLINA EMERGENCY FOOD

Ashley Chaifetz, University of North Carolina at Chapel Hill
Benjamin Chapman, North Carolina State University

UVM Food Systems Summit
Burlington, Vermont
June 16, 2015
BACKGROUND

- Since 2008, 14.5% of Americans are food insecure
- In North Carolina, it’s even higher:
  - Overall food insecurity rate: 19.3%
  - Child food insecurity rate: 27.3%
- Emergency food providers in NC: 2,500+
  - Food pantries
  - Food banks
EACH YEAR,

an estimated 48 million Americans contract foodborne illness, stemming from grocery stores, child day care centers, church banquets, county fairs, restaurants, private homes, schools, and even food banks (Scallan et al., 2011)
THE POLICY PROBLEM

There’s no policy, no regulation.
RESEARCH QUESTIONS

• What entities supply food pantries in North Carolina?
• What steps are taken by different supply chain actors to lessen (or, increase) the risk of pathogenic bacteria during transport?
• Does the safety of food transported to pantries vary depending upon location? By food bank partnership?
DATA: COLLECTION AND SAMPLE

- 105 food pantries
- 12 counties representing all 7 food bank regions
- Collected: February to June 2014
- Quantitative and qualitative analysis of semi-structured on-site interviews with pantry managers and observational data
Survey Instrument

- Interviews and observations
- Pantries scored using a modified Food Establishment Inspection Report

### Food Establishment Inspection Report

<table>
<thead>
<tr>
<th>Establishment Name:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location Address:</td>
</tr>
<tr>
<td>City: ________ State: North Carolina</td>
</tr>
<tr>
<td>Zip: ________ County: ________</td>
</tr>
<tr>
<td>Permittee:</td>
</tr>
<tr>
<td>Telephone:</td>
</tr>
<tr>
<td>○ Inspection  ○ Re-Inspection</td>
</tr>
<tr>
<td>Wastewater System:</td>
</tr>
<tr>
<td>○ Municipal/Community  ○ On-Site System</td>
</tr>
<tr>
<td>Water Supply:</td>
</tr>
<tr>
<td>○ Municipal/Community  ○ On-Site Supply</td>
</tr>
</tbody>
</table>

### Foodborne Illness Risk Factors and Public Health Interventions

<table>
<thead>
<tr>
<th>Compliance Status</th>
<th>OUT</th>
<th>CO</th>
<th>R</th>
<th>VR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supervision</td>
<td>2551</td>
<td>2</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>1. PIC Present: Demonstration - Certification by accredited program &amp; perform duties</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Employee Health</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1 In Out: Management, employees, knowledge; responsibilities &amp; reporting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2 In Out: Proper use of reporting, restriction &amp; exclusion</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Good Hygiene Practices</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1 In Out: Proper eating, tasting, chewing or tobacco use</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.2 In Out: Hands clean &amp; properly washed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Preventing Contamination by Hands</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.1 In Out: No bare hand contact with RTE foods or pre-approved alternate procedure properly followed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Approved Source</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.1 In Out: Handwashing sinks supplied &amp; accessible</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Protection from Contamination</td>
<td>2053, 2554</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.1 In Out: Food obtained from approved source</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.2 In Out: Food received at proper temperature</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.3 In Out: Food in good condition, safe &amp; unadulterated</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.4 In Out: Required records available: shelfage tags, parasite destruction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Good Retail Practices: Prevent contamination, use dated products, label products properly.
SUPPLY CHAIN DESCRIPTORS

- Kinds of food distributed: perishable and non-perishable
- Commodity program participation: TEFAP and SNAP
- Storage procedures
- Transport times
- Food sources and method of delivery
- Traceability

Bar chart showing percentages of different food categories:

- Meat: 85.7%
- Canned/packaged goods: 88.6%
- Dairy: 97.1%
- Eggs: 48.6%
- Deli/lunch meat: 63.8%
- Home-canned/processed: 16.2%
- Hunted game: 12.4%
- Bread and pastries: 87.6%
- Restaurant leftovers: 20.0%
STORAGE PROCEDURES

- Fruits and vegetables:
  - Not distributed: 10%
  - Pantry: 30%
  - Refrigerator/Walk-in cooler: 30%
  - Freezer: 30%
  - No storage/Give immediately: 10%

- Dairy:
  - Not distributed: 20%
  - Pantry: 40%
  - Refrigerator/Walk-in cooler: 10%
  - Freezer: 20%
  - No storage/Give immediately: 20%

- Eggs:
  - Not distributed: 20%
  - Pantry: 50%
  - Refrigerator/Walk-in cooler: 10%
  - Freezer: 20%
  - No storage/Give immediately: 10%

- Bread:
  - Not distributed: 20%
  - Pantry: 40%
  - Refrigerator/Walk-in cooler: 10%
  - Freezer: 20%
  - No storage/Give immediately: 10%

- Deli/lunch meat:
  - Not distributed: 10%
  - Pantry: 40%
  - Refrigerator/Walk-in cooler: 30%
  - Freezer: 10%
  - No storage/Give immediately: 10%
Supply Chain Descriptors

- Kinds of food distributed: perishable and non-perishable
- Commodity program participation: TEFAP and SNAP
- Storage procedures
- Transport times
- Food sources and method of delivery
- Traceability
Supply Chain Descriptors

- Kinds of food distributed: perishable and non-perishable
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- Storage procedures
- Transport times
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- Traceability
RISK FRAMEWORK

- Traceability
- Training
- Recalls
- Written SOPs
- Distribute unregulated foods
- Repackaging and RTE foods
- Storage of meat, dairy, eggs, vegetables
- Unknown transport means
FRAMEWORK ANALYSIS

\[(RISK \, SCORE) = \beta_0 + \beta_1(FB) + \beta_2(TS) + \beta_3(DT) + \beta_4(PM) + \beta_5(RV) + \beta_6(SR) + \beta_7(FT) + \varepsilon\]

- **FB** is food bank partnership
- **TS** is participation in TEFAP or SNAP or both
- **DT** is a vector of variables for food distribution
- **PM** is paid manager
- **RV** is regular volunteers
- **SR** is supplier requirements
- **FT** is a vector of variables designating the type of food distributed.
# Marginal Effects

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Full sample</th>
<th>Food bank partners only</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N=100</td>
<td>N=82</td>
</tr>
<tr>
<td>Food bank partner</td>
<td>1.49*</td>
<td>3.15***</td>
</tr>
<tr>
<td></td>
<td>(0.69)</td>
<td>(0.59)</td>
</tr>
<tr>
<td>TEFAP/SNAP participation</td>
<td>-2.86***</td>
<td>-3.15***</td>
</tr>
<tr>
<td></td>
<td>(0.66)</td>
<td>(0.59)</td>
</tr>
<tr>
<td>Food distribution process</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-pack items</td>
<td>-0.58</td>
<td>-0.79</td>
</tr>
<tr>
<td></td>
<td>(0.58)</td>
<td>(0.64)</td>
</tr>
<tr>
<td>Client choice</td>
<td>-1.69*</td>
<td>-1.71*</td>
</tr>
<tr>
<td></td>
<td>(0.94)</td>
<td>(0.89)</td>
</tr>
<tr>
<td>Type of foods distributed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perishables and non-perishables</td>
<td>-2.57***</td>
<td>-2.39***</td>
</tr>
<tr>
<td></td>
<td>(0.61)</td>
<td>(0.68)</td>
</tr>
<tr>
<td>Non-perishables only</td>
<td>-3.88***</td>
<td>-4.78***</td>
</tr>
<tr>
<td></td>
<td>(0.89)</td>
<td>(1.41)</td>
</tr>
</tbody>
</table>
SIGNIFICANCE AND POLICY IMPLICATIONS

• Food bank partnership versus TEFAP participation
• Client choice models least risky option
• Perishables and non-perishables
• Time for regulation?
ASHLEY CHAIFETZ
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