Use of Subtyping Data by FSIS: A Public Health Based Approach to *Salmonella* Control in Raw Poultry

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Agency Public Health Goals

• Healthy People 2010

• Reduce *Salmonella* incidence in PR-HACCP sets
  – Simply reducing percentage of product with pathogen *should* result in a reduction in disease incidence
  – 2010 goal: 90% of all plants at 50% or less of standard

• Expanded use of risk assessment

• Collect and use relevant and representative data
Milestones  
FSIS *Salmonella* policy

1983  
Microbiological testing of RTE meat and poultry products

1992-6  
Baseline studies to identify performance standards

1996  
PR-HACCP rule issued, including *Salmonella* performance standards for certain classes of raw products

1996-2000  
Phased implementation of HACCP
Milestones

FSIS Salmonella policy

2001-5  Upward trend in PR-HACCP Salmonella rates
2005-6  FSIS-led Public Meetings on Pre- and Post- Harvest Control of Salmonella
2006   Salmonella Initiatives Announced (71 FR 977 Feb. 2006)
2007   FSIS observes reduction in PR-HACCP Salmonella rates
2006 Federal Register Notice

• Immediate goals
  – Reverse upward trend in PR-HACCP set *Salmonella* positive rates
  – Encourage industry to take steps to improve process control
  – Further assess process control for pathogens in all classes of raw products

• 11 initiatives announced and discussed at public meeting
2006 FRN Initiatives related to subtyping

- **Serotype data**
  - obtained more quickly
  - Information provided to establishments
  - FSIS will publish aggregate results

- **Food Safety Assessments**
  - will be performed in establishments that demonstrate poor process control *before* set failure
  - Focus on sample sets containing serotypes that are commonly associated with human illness

- **PFGE data**
  - Timely sharing with public health partners (CDC, FDA, states)
  - FSIS will develop policies on data use
PFGE Data Sharing
FSIS-ARS Memorandum (2007)

• PFGE patterns from all PR-HACCP verification samples are available to FSIS upon generation

• Enables rapid comparison between VetNet and PulseNet databases
  – FSIS provided real-time access to VetNet database
  – FSIS samples assigned VetNet and PulseNet pattern names

• Will assist illness and outbreak investigations associated with FSIS-regulated products
United States Department of Agriculture
Food Safety and Inspection Service

Public PFGE Databases

Raw product (FSIS verif.)
Live animal (NAHMS)
Retail product (NARMS)
ARS-BEARS (Athens, GA)

RTE product (FSIS verif.)
Product (FDA verif.)
Clinical and Product (State & Local HD)

PulseNet labs (FSIS, FDA, States, Localities)

VetNet
PulseNet
PulseNet / VetNet Database Searches

- PulseNet clusters (pattern match)
  - Pattern match
  - May be under investigation by PN participants

- VetNet frequency, rank and spatial-temporal distribution
  - Analysis of pattern within VN database

- Restricted to recent additions to PN (30-60 days)

- Restricted to additions from establishment
### Possible Public Health Categories*

<table>
<thead>
<tr>
<th>Category</th>
<th>PHLIS**</th>
<th>PulseNet</th>
<th>VetNet</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>3</td>
<td></td>
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</tbody>
</table>

*Further subcategories
- matches with current cluster
- recent activity in PN or VN
- Historical activity in establishment or region

**PHLIS = Public Health Laboratory Information System.
- Prevalence of Salmonella serotypes in clinical samples
Sorting PR-HACCP Patterns

• Retrospective analysis, limited to broiler samples?
• Establish feasibility of data sorting and ranking
• Establish algorithms for automated sorting
• Establish thresholds and action points
### Sorting PR-HACCP Patterns

- All *broiler* PR-HACCP isolates in VetNet (1 month period, summer 2007)

- Sort and rank each PFGE pattern (cat 1 > cat 2 > cat 3)

<table>
<thead>
<tr>
<th>Category</th>
<th>Isolates</th>
<th>% total</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>141</td>
<td>62.7%</td>
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<tr>
<td>2</td>
<td>33</td>
<td>14.7%</td>
</tr>
<tr>
<td>3</td>
<td>51</td>
<td>22.7%</td>
</tr>
<tr>
<td>total</td>
<td>225</td>
<td>100%</td>
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</tbody>
</table>
FSIS Policy Development on PFGE: guiding concepts

• FSIS will develop procedures to make proactive use of PFGE data from PR-HACCP samples

• FSIS, working with PH partners, will use PFGE data to investigate foodborne illness outbreaks:
  – tracing products in commerce
  – in-plant investigation (i.e., Food Safety Assessment)
  – intensified sampling of implicated product

• FSIS is developing a Foodborne Disease Investigation Directive to coordinate Agency resources during outbreak investigations
FSIS Policy Development on PFGE: guiding concepts, continued

- FSIS, working with industry, will use subtyping data to improve food safety systems
  - PFGE data (i.e. database comparisons) will be shared with individual establishments or corporations
  - PFGE data (and an establishment’s reaction to the data) will be considered when assessing food safety systems

- Establishments should use PFGE and other subtyping data to take proactive steps to protect public health
  - Perform in-house investigation or data collection
  - Reassess hazard analysis or HACCP plan
  - Take corrective actions if necessary
FSIS Policy Development Team
Salmonella Subtyping

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