Investigation of Salmonella Enteritidis in humans in BC

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Outline

● Epidemiology of *Salmonella* Enteritidis (SE) in humans in BC

● Outbreak investigation in BC (2008-2010)
  ● Epidemiological
  ● Environmental
  ● Collaboration with animal health colleagues
  ● Actions taken

● Challenges
SE Incidence in BC, 2000-2009

Source: BCCDC labs
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Distribution of Phagetype within SENXAI.0003 (SE 3), BC

PT 8 90%
PT 13 a 4%
PT 51 4%
Other 2%

Source: BCCDC labs
SE 3 infections, BC, by reported week, January 2007- August 2010

Source: BCCDC labs
Emergence of SE 3 in BC

- Restaurant cluster associated with raw egg mayo in June 2008
  - Raw egg mayo tested positive for SE 3
- Previous outbreaks
  - 2000: egg wash*
  - 2007: egg noodle factory
  - 2007: chicken omelette
- Animal data
  - BC Ministry of Agriculture
    - Strain identified in ill/dead chickens and CFIA broiler hatchery monitoring samples
  - CIPARS
    - PT 8 was a common strain identified from chicken sources between 2006 and 2008

Investigation results - Epidemiological

Case interviews conducted with all cases of salmonellosis
Investigation results-
Epidemiological

Retrospective case control study
92 cases matched by geography and age to controls
Investigation results-
Environmental clusters
Investigation results - Environmental

- Traceback
  - Attempted for all clusters and sporadic cases where possible
  - No single common source was identified
  - Significant challenges identified during ungraded egg traceback
    - Lack of receipts, supplier information
  - Redistribution of eggs from farms
    - Regulatory issues
Investigation results - Animal data

- Registered broiler hatchery monitoring
  - Increase in SE between 2007 and 2009
  - PT 8 was the predominant strain reported

- Ill and dead chicken diagnostics
  - Increase in SE between 2007 and 2009
  - PT 8 was the predominant strain reported

- Registered table egg monitoring
  - Stable SE detection
  - No PT 8 detected as of August 1, 2010
Investigation conclusions

- Significant burden of human illness
- Concurrent emergence of the same strain in humans and the poultry sector between 2008 and 2010
- Most likely source of illness is eggs
- Various brands, locations and sources identified
- Collaborative investigation and multiple sources of data required
Actions taken

- Public health
  - Annual media releases
  - Confiscation of eggs
    - 82 between 2007 and 2010
  - Progressive enforcement
- Animal health
  - Shared information with the supply managed poultry sector.
  - SE vaccination program and enhanced mitigation strategies in broiler breeder flocks (2009)
  - Initiated sampling for broiler hatcheries at farm level (Winter 2009)
  - BC Broiler Hatching Egg Commission recommended that hatching eggs not be sold at farmgate for consumption.
- Joint actions
  - Meetings between industry, animal and public health
Challenges and solutions - Investigations

- Lab methods for SE
  - Not always discriminatory
  - Different authorities using different testing methods

- Look for standard methods that improve differentiation and interpretation
Challenges-Investigations

- Identifying a common source is challenging
  - Eggs are commonly consumed (as is chicken)
  - Could not rely on only one method of investigation
  - Traceback had limited success
  - No single source identified

- Use of environmental clusters
- Required data from multiple sources

- Our experience in BC with SE 3
  - Are there differences in sources?
    - Based on regional practices/industries
    - Strain of SE

- Opportunity for national collaboration on human illness investigations
Challenges-Investigations

- Epidemiological and environmental investigation identified eggs; however SE 3 has not been identified in the table egg sector
  - Are broiler hatching eggs the only egg source?
  - Unable to identify association of human illness with chicken meat
  - Is the surveillance system able to detect SE 3 in table eggs?

- Will changes to industry monitoring of table eggs have an impact?
- Share data to target response
Challenges-Control

- Actions to date have not had an impact
  - Is it too early to assess?
  - Are the surveillance systems able to detect this change?
- Ongoing and effective monitoring for SE among all sectors

- Are our actions not effective?
- Other contributing factors?
  - Restaurants, Regulations, Imported products
- Consider what additional actions we can take

- Continue to take a multi-prong and multi-sectoral approach to control
What is causing illness in humans?

- Eggs
- Chicken
- Both

- How much does each contribute to human illness?
- How widespread is this in the industry? Food chain?
- How can we take effective collaborative actions?
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THANK YOU

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