E. coli O157:H7 Outbreaks 2007-2008 Learnings

Barb Masters and Dennis Johnson

Olsson Frank and Weeda
Terman Bode and Matz
October 2008

2007 Outbreaks[+]

- Grinder A: 36 illnesses[*]

- Grinder B: 47 illnesses[*]

- Grinder C: 52 illnesses[*]

[+]   CDC reported at least nine beef related outbreaks in 2007 (five multi-state, which include the three above). The outbreaks discussed herein were selected due to information as to sources of raw materials.

[*]   Illness information is based on unofficial, preliminary reports and may be incomplete.

Assumption

- Looking at the three 2007 outbreaks, the root cause was not the practices at the grinding facility *per se*; rather it was that the establishment purchased contaminated product – product contaminated to such a level as to cause illness.

- If proper sampling and laboratory techniques and/or a validated system had been executed at these slaughter facilities, the contaminated product may not have reached the grinders. Given in these circumstances the contaminated product did reach the grinders, there was virtually nothing the grinders could do to remove the contamination.

- So the inquiry should focus on the ultimate suppliers.

The Suppliers: 2007

- Grinder A - Three Common Suppliers:
    1) A Canadian slaughter establishment (Rancher's);
    2) A Western slaughter establishment; and
    3) An establishment providing a low temperature rendered product.

The Suppliers: 2007 (cont'd)

- Grinder B - Various Suppliers:
  - "Likely Source" was Rancher's Beef in Canada (*See* FSIS Press Release, October 26, 2007).

- Grinder C - Four Common Suppliers:
  1) A Southwest establishment;
  2) A South American country;
  3) A Midwest establishment; and
  4) Treated trimmings from an outside supplier.

Common Theme With Suppliers

Available information revealed the following:

- None of their suppliers had a high incidence rate for *E. coli* O157:H7 in trim (based on the establishment's testing).

- Two of slaughter establishment's had questionable process controls:
  - One had not properly validated the use of lactic acid for the carcass intervention step (they were utilizing 1.5% solution); and
  - One had not properly validated the hot water cabinet that was being used as their intervention for *E. coli* O157:H7.

- Two of the establishment's had questionable sampling practices:
  - One foreign supplier (Rancher's) had questionable sampling practices according to FSIS (re-testing).
  - One establishment was not taking n=60 samples from the exterior surface as verified by a 3rd party audit.

- Only one (treated trimmings) had a lethality intervention

2007 Learnings

- Suppliers had extremely low trim incidence rates (some had no positives) when industry average was between 1% and 2% (anecdotally).

- The failure of these establishments to find positives resulted in the failure to provide feedback to their system.

- This in turn led to continuing and undetected primary deficiencies in the slaughter process.
  - Process control begins on the slaughter floor.

2008

- Three Outbreaks:
  - Retailer A
  - Retailer B
  - Non-profit Organization[*]

Given: the source has not been conclusively demonstrated this outbreak will not be discussed further here.

Common Supplier to the Retailer A & Retailer B 2008 Outbreaks

Slaughter Establishment A

Based on third party information, we understand:

- Slaughter establishment A did not have an establishment positive trim in 2007 or 2008 before the outbreaks;

- This establishment had more than one positive in the FSIS National Trim Baseline (the only large plant to have positives);

- The establishment's analytical sample size was 25 g; industry standard is 375 g; FSIS sample size is 325 g;

- Customers who conducted testing on Establishment A's product detected multiple positives; and

- For the production at issue in the outbreaks, Establishment A did not operate all interventions.

2008 Learnings

- The same as 2007:
  - Supplier had no positives in trim testing when industry average was between 1% and 2% (anecdotally);
  - The failure to find positives resulted in the failure to provide feedback to the system; and
- This in turn led to continuing and undetected primary deficiencies in the slaughter process.
  - Process control begins on the slaughter floor.

Applications of Learnings

- These establishments were relying on sampling as feedback to their slaughter system.
  - Process control begins on the slaughter floor.

- Proper sampling and laboratory techniques are necessary for reliable results – negative or positive.

- Virtual absence of positives should trigger a review as to adequacy of sampling and/or laboratory methods:
  - Is the sample being collected properly (n=60 surface excision)?
  - Is the analytical sample 375g?
  - Is the sample being properly enriched?
  - Is the laboratory method adequate to detect all *E. coli* O157:H7? (as sensitive as the FSIS method)

Further Research Suggestions for FSIS

- For all outbreaks (2007-2008) with identifiable beef source, ascertain suppliers.

- Review suppliers' HACCP records and *E. coli* O157:H7 test results during the relevant period.

- Focus initially on establishments with all negative findings:

  - interventions – were they operated as intended (e.g., parameters in FSIS Dir. 7120.1)

  - sample methods (exterior surface)

  - laboratory method (sensitivity – FSIS)

Hypothesis

- Process control at slaughter is essential in controlling *E. coli* O157:H7.

- Effective process control is based on validation of process and on-going verification.

- If an establishment uses testing as part of the on-going verification, such testing must incorporate adequate sampling and analytical techniques.

Policy Direction

- If hypothesis is valid, FSIS should adopt policies to address this so as to minimize future outbreaks.

  - FSIS emphasis on the slaughter operations that serve as a source to grinders.

    - (e.g., validation of program; on-going verification; using interventions as per FSIS Dir. 7120.1; surface excision for sampling; etc.)

  - FSIS emphasis on trim testing, not ground testing (test closer to the source).

Questions?