



Lesson 2.2

FSI Traceback

Estimated time: Two 50 min periods

Instructional Overview

Lesson 2.2 highlights the importance of traceback in the production of fresh produce through the review of a real foodborne illness outbreak. Students will read the case and answer the questions to see why traceback is critical in an investigation.

Instructional objectives

1. Identify methods used in developing a traceback system.
2. Read and analyze a foodborne illness outbreak report.
3. Answer questions about the report and create a diagram of product movement.
4. Determine ways contamination risks could have been reduced.

Assessment

Students answer the questions related to the foodborne illness outbreak report, scoring at least 70% on the grading rubric.

Relevant learning standards - NSECS-F, NHECS-1

Equipment, supplies, and materials

1. Glo Germ™ powder.
2. Minimum of two bags of lettuce.
3. PowerPoint Presentation – PPT 2.2.
4. Investigation Activity 2.2 – one per student or use ppt template.
5. Reduce Microbial Risks with Good Agricultural Practices, pamphlet.
6. Food Safety Begins on the Farm: A Grower's Guide, booklet.
7. 11"x17" blank paper – one per group.

References and background information

1. Investigation of Pre-washed Mixed Bagged Salad following an Outbreak of *Escherichia coli* O157:H7 in San Diego and Orange County
<http://www.dhs.ca.gov/ps/fdb/local/PDF/PO%20Report%20Web%20Version%202.PDF>
2. Guide to Traceback of Fresh Fruits and Vegetables Implicated in Epidemiological Investigations. U.S. Food and Drug Administration. June 2006 Internet Access at
http://www.fda.gov/ora/Inspect_ref/igs/epigde/epigde.html
3. GAPsNET www.gaps.cornell.edu

Interest approach

Take one bag of lettuce and place a small amount of Glo Germ™ powder in the bag – shake until powder disappears and it is evenly distributed. Place bag with another unadulterated bag so students do not know which bag has been changed. **Alternatively**, bring in two bags of ready-to-eat lettuce with different expiration dates.

The FDA has issued a recall of the bagged salad involved in a foodborne illness outbreak. How can we tell which bagged salad products were affected by this outbreak?

What information does the FDA supply to the public to help them identify the contaminated food when there is a recall? Answer: lot numbers, dates, and other information found on the consumer package.

Have students in the class take a vote on which salad bag is contaminated. Tell students that you “contaminated” one of the bags with Glo Germ™ powder. Using the black light, show the students the bags. The simulated contamination will glow. In reality, contaminated food does not glow under a black light, so the FDA provides information for package identification when it issues a recall.

Classroom procedures

Teaching procedures	Content
Review previous lesson.	<p>In the previous lesson, we talked about many different kinds of foods and the process of how they get from farms to our tables. Briefly review the pre-packaged salad from last lesson and how it travels from farm to table.</p> <p>We also spent time thinking about how these foods might become contaminated with physical, chemical, and biological hazards. Name several physical, chemical, and biological hazards. Name some ways in which these hazards might contaminate or appear in food. Why is it important to emphasize food safety measures for fresh produce?</p>
State expectations for today’s lesson.	<p>By the end of this class students should be able to:</p> <ol style="list-style-type: none"><li data-bbox="850 1528 1386 1591">1. Identify methods used in developing a traceback system.<li data-bbox="850 1598 1370 1661">2. Read and analyze a foodborne illness outbreak report.<li data-bbox="850 1667 1386 1730">3. Answer questions about the report and create a diagram of product movement.<li data-bbox="850 1736 1370 1799">4. Determine ways contamination risks could have been reduced.

<p>Introduce Traceback Systems</p> <p>Traceback: The ability to identify the origin of any food product and all subsequent handling events as food moves through the food system.</p>	<p>When investigating the source of a foodborne illness outbreak, traceback is a useful tool. Traceback allows the product to be identified and to be followed through the food system in either direction (forward or backward). Each person responsible for one step in the process should be able to trace the food one step forward and one step backward. For instance, a grower should be able to tell in which field a lot* was grown (one step back) and to whom he sold that particular lot (one step forward). If this information is available for each step in the process then a food can be traced from farm to table. Traceback is used for all different types of foods and consumer goods and is particularly important in a foodborne illness investigation.</p> <p>*A lot means the foods produced during a specific period of time or in a particular field indicated by a specific code.</p>
<p>Introduce Investigation Activity 2.2.</p> <p>Split students into their Investigative Teams. Hand out one 11”x17” paper per group.</p> <p>Hand out the Investigation Activity 2.2 one per student or use the ppt template to help students organize their notes.</p>	<p>As FSI Investigators, the next step in our investigation is to determine the source of the <i>E. coli</i> O157:H7 contamination in the pre-packaged salad.</p> <p>Follow instructions to traceback the contaminated salad from the restaurant where it was consumed to the farm where it was grown.</p>
<p>When investigating a foodborne illness outbreak, a timeline that includes all the information detailing what is known about the outbreak must be constructed. This helps to identify the areas where contamination could occur and prevention efforts could be focused.</p>	<p>To complete this lesson, students need to construct a timeline and answer the traceback questions. Their timeline should be neat and contain all of the following information:</p> <p>Known information: -FSI Traceback, Investigation Activity 2.2</p> <p>Time: assign times to your timeline including important dates such as production dates or dates when people became ill. Location: identify the location or business where each step takes place *hint: most will take place at the farm, restaurant, or packinghouse.</p>

<p>Extension Activity</p>	<p>Have students research another food product that has needed traceback to determine the origin of a foodborne illness outbreak. Examples; Foodborne illness outbreak in almonds Foodborne illness outbreak at fast food restaurant Foodborne illness outbreak in spinach</p>
<p>Relate to future lesson</p>	<p>In the next lesson, we will use the Good Agricultural Practices (GAPs) Farm Assessment to assess farm management practices and help reduce the risk of microbial contamination.</p>
<p>Reflections for future use.</p>	



FSI Traceback

Investigation Activity 2.2

Situation:

On October 6th, 2003, the County of San Diego Health and Human Services Agency notified the California Department of Health Services (CDHS) of a cluster of five patients with *E. coli* O157:H7 infections who had all eaten food from one of two Pat and Oscar's restaurants in San Diego County. There were 48 other individuals who were affected who had also eaten salads. All together, these people consumed 36 Greek salads, 6 Lemon Chicken salads, 3 Cobb salads, and 3 Antipasto salads. All salads were prepared with the same base salad mix of 70% iceberg lettuce and 30% romaine lettuce.

This Investigation Activity is condensed from an Investigation of Pre-washed Mixed Bagged Salad following an Outbreak of Escherichia coli O157:H7 in San Diego and Orange County <http://www.dhs.ca.gov/ps/fdb/local/PDF/PO%20Report%20Web%20Version%202.PDF>.

Objective:

Trace the *E. coli* O157:H7 outbreak from the sick consumers back to the place of origin using the information provided.

Procedure:

In your Investigative Teams:

1. Organize the information collected by the Health Department into a timeline.
2. Use the timeline to answer the traceback questions in this investigation.

Traceback Review Documentation for Pat and Oscar's Restaurant

Pat and Oscar's (PO) invoices confirm all produce ingredients are supplied by Family Tree Produce (FTP). The dates for deliveries in question are from September 15th to October 7th. Some of the invoices note refusal of lettuce product due to poor quality.

Three types of bagged salad were in PO walk-in cooler: a 70/30 lettuce/romaine mix; pre-washed spinach; and chopped romaine. All products were supplied by FTP.

FTP was visited to continue the traceback process. FTP is a produce distribution center and does not process, package, or repack any lettuce products. Invoices were available for deliveries of 70/30 mix to PO restaurants for September 15th to October 6th. The 70/30 mix is supplied by Gold Coast Produce (GCP) in Oxnard, CA, the pre-washed spinach and chopped romaine are both from River Ranch (RR) in Salinas, CA.

Only the 70/30 mix was used at PO to prepare the salads implicated in the outbreak.

When meeting with FTP, inspectors found that the 70/30 mix was a special order product processed by GCP specifically for PO restaurants. However, other restaurants and schools may have received the mix due to substitution of product.

GCP traceback investigation – GCP’s customer sales list identified FTP as the only account receiving 70/30 lettuce mix. GCP received romaine lettuce from Diamond Produce (DP) of Salinas, CA. DP is a grower/shipper and therefore contracts with farmers to grow produce. DP took ownership of the crop at maturity and was responsible for harvesting, boxing, cooling, and cold storing lettuce.

GCP processes the cut lettuce into the 70/30 bags. They are then shipped in five pound, clear sealed plastic bags. No labeling or markings on the bag identified the supplier or the product. The bags are shipped four bags per box. Each bag had a small paper sticker that contained a four digit lot number and production date.

GCP used a common carrier to transport lettuce from cold storage to their Oxnard facility. GCP received an average of two lettuce shipments per week from DP. Romaine was received as cored or un-cored heads in 40 or 50 pound plastic lined boxes. Iceberg was received in 900 pound plastic lined bins. All DP romaine and iceberg cored lettuce was cored in the field during harvest. DP growers did not grow the romaine provided to GCP, rather the romaine was brokered through DP for shipment to GCP.

Invoices and bills of lading obtained from GCP for lettuce used to make the 70/30 mix show that September 15th is the earliest that lettuce could have been shipped from the grower, processed by GCP and received at PO to coincide with the first exposure date of September 27th. October 6th was the last date of delivery that would relate to the last October 7th exposure.

3-D cooling in Salinas, CA, was used to cool the lettuce before final packing.

DP traceback investigation – DP contracts with growers for iceberg lettuce. DP does not contract for romaine, but instead buys romaine from growers once crop is harvest ready. DP purchased romaine for the 70/30 mix from RR, Paul’s Pak (PP), and The Pismo Oceano Vegetable Exchange (POVE). DP used their equipment and harvest crews for iceberg lettuce harvest at their grower’s fields. Romaine was harvested by a DP crew, grower crew, or contract crew.

DP provided a list of farms that grew lettuce harvested during the implicated time. Seven growers and 16 fields supplied iceberg lettuce at that time. For that timeframe 13 fields supplied romaine. DP supplied investigators with harvest dates, field identification, and lot numbers used to identify fields during harvest.

PP traceback investigation – PP contracted one section of a romaine field sold directly to DP. DP harvested, packed, and transported the romaine to GCP. PP was not directly involved in the growing or harvesting.. The growers under contract were Francioni Brothers and Barrett Ranch.

RR traceback investigation – Four romaine fields were sold to DP, harvested by RR crew, cooled by 3-D cooling, and shipped to GCP. Grower lists were supplied.

POVE traceback investigation – POVE was contracted for direct shipment to GCP by DP. POVE was responsible for growing, harvesting, cooling, and shipping the romaine. All shipments were made within two days of harvest. Four fields were involved.



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Investigation Activity 2.2

Investigative Team members: please answer the following questions.

1. At what location does the investigation start?
2. What was the common component across all the individuals that were sick?
3. How did Pat and Oscar's trace the source of their produce back one step and what is the name of that operation?
4. What steps in the processing does the distributor involved perform?
5. How many companies were involved in supplying product to the distributor and what are their names?
6. Which packer is directly tied to the outbreak at Pat and Oscar's? Why?
7. What did inspectors find out about the 70/30 mix and what causes even more concern about a larger outbreak?
8. How is each bag of 70/30 mix identified so it can be tracked?
9. What records at the packer, indicate FTP and subsequently Pat and Oscar's as the outbreak location?
10. How is the lettuce transported from cold storage to GCP?
11. The packer purchases lettuce from a grower. What grower is associated with lettuce for the dates in question?
12. How was the lettuce cooled prior to packing?
13. What information must DP provide to allow continuing traceback on the product?
14. Once the product can be traced back from consumer to field, what should be investigated?
15. A key part of the traceback is that companies can provide the ability to trace one step forward and one step back in the processing chain. How do companies provide the ability to trace forward and back?



Key to traceback questions:

1. Pat and Oscar's (PO) restaurant.
2. Ate salad at PO's made from same salad base.
3. Dated invoices for time of illness. Goes to FTP.
4. Distribution only, no packing.
5. Two, GCP and RR.
6. GCP – only 70/30 mix was implied in outbreak
7. 70/30 is a custom mix, but was distributed to other businesses beyond PO's
8. Small sticker with lot # and production date
9. GCP invoices show only FTP receiving 70/30 mix
10. Commercial truck carrier
11. DP of Salinas, CA
12. 3-D Cooling in Salinas, CA
13. Specific growers and fields
14. How contamination with *E. coli* occurred and what practices could be improved to prevent future contamination.
15. Good records and invoices on all products leaving and entering their company.



This assignment will be graded using the following Grading Rubric:

Assessment criteria	Maximum points	Points scored
The traceback questionnaire was complete and included with the timeline.	10	
TOTAL	/10 =	%