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To: File, Colorado Department of Public Health and Environment (CDPHE)
Communicable Disease Epidemiology Program

From: Jennifer Sadlowski, CDPHE Communicable Disease Epidemiology Program
(Contact: Alicia Cronquist – alicia.cronquist@state.co.us , (303)-692-2629)

Subject: Multi-state E. coli O157:H7 09-BS / 04G Outbreak (outbreak 2009-00-011)

Multi-county: Jefferson & Pueblo Counties
Multi-state: Colorado, Connecticut, Iowa, Minnesota, Missouri, Nebraska, and North Carolina

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In mid-September 2009 the Colorado Department of Public Health and Environment (CDPHE) identified two E. coli O157:H7 cases that were matched by PFGE pattern. Both cases were children with onset on 9/8/2009. One was from Jefferson County and the other from Pueblo County. CDPHE collected routine STEC O157/non-O157 case investigation forms from the local county health departments and reviewed them for similarities in exposures. Both cases reported attending the Colorado State Fair in Pueblo, Colorado prior to onset. The complete food history from one case was still pending return phone calls from one of the case's parents. Counties were asked to re-interview cases asking them more detailed questions about activities surrounding their attendance at the Colorado State Fair. In addition, CDPHE actively solicited case investigation forms from several other STEC cases where molecular subtyping was pending.

While data collection on State Fair exposures was in progress, the Minnesota Department of Health notified CDPHE that Minnesota had 1 *E. coli* O157:H7 case that was matched by PFGE pattern to the 2 Colorado cases and identified through PulseNet. The Minnesota case had traveled to Colorado and Nebraska in the week prior to onset, but did not have any apparent exposures in common with the other two Colorado cases. The Centers for Disease Control (CDC), Food and Drug Administration (FDA), and other states (CT, IA, MN, MO, & NC) became involved as new cases appeared in their states.

A case was defined as a person with E. coli O157:H7 isolated from any site with Colorado PFGE pattern 09BS 4G since September 1, 2009. The other states involved also interviewed their cases and evaluated them for common exposures. CDC, FDA and the states involved had weekly conference calls to update everyone on the progress occurring in each state.

Cases in Minnesota and Iowa ate at a common Italian restaurant in Omaha, NE on 9/5/2009. The North Carolina case also ate at an Italian style restaurant. Once the complete food history was obtained from the parent of the second Colorado case, we noted that both Colorado cases reported eating at the same Italian style restaurant on the

same day (9/6/2009) in Pueblo, Colorado. Based upon the food histories from other states, the Colorado cases were re-interviewed and specifically asked about lettuce consumption, as well as a detailed food history about other foods consumed while visiting the Italian restaurant.

Upon re-interview, both cases report exposure to pasta, sauce, meatballs, and house salads. One case reports eating the special with pasta, spaghetti sauce and meatballs with grated Parmesan cheese. This case also reports consuming beef barley soup with vegetables and croutons, house salad with house dressing, as well as olives, celery sticks, rolls and butter. The 2nd case reports consuming rigatoni and meatballs. This case did not have their own house salad, but most likely ate some of a sibling's salad and croutons. The house salad contained fresh iceberg and romaine lettuce, grated tomatoes, blue cheese crumbles, and red wine vinaigrette Italian style. In the evening patrons can add marinated vegetables or red onions. Neither case ate anything off of the Children's menu. The special for the day (9/6/2009) was pasta with a choice of meat.
The only common food shared among patrons of the Italian restaurants in Colorado and Nebraska was a house salad. Eight out of ten cases reported lettuce consumption at a restaurant during their exposure period. A case control study was not performed because of strong epidemiological links between cases (i.e. histories of eating lettuce in restaurants with tightly clustered onset dates).

The Italian restaurant in Colorado provided their invoices for food items for the 4 weeks prior 9/6/2009. The invoices were reviewed. CDPHE asked additional questions regarding lettuce products and their usage, frequency of shipments, supplemental buying procedures, and the shipment suspected to be used on 9/6/2009. These invoices along with the invoices from the Nebraska restaurant were faxed to CDC to look for similarities in distributor and product.

Colorado contacted U.S. Food Service, the local distributor, and was able to determine that the lettuce used at the Colorado restaurant came from Tanimura & Antle in Salinas, California. By mid-October Colorado had not received any further communication from the CDC and FDA about the traceback, so Colorado made several inquiries about the status of the investigation. Investigators from the CDC reported that FDA had decided not to pursue further traceback activities because of limited resources and the length of time that had elapsed since the original exposures with no new cases. Colorado and other states challenged this decision, but FDA did not change its position about pursuing the traceback further. At this point other states ended their investigation as well.

The source of this outbreak remains uncertain although lettuce remains a leading hypothesis. It is a possibility that the source was another common food or ingredient item that was eaten by the cases, but this could not be determined without further investigation and completion of traceback activities.

At the end of this outbreak, E. coli O157:H7 cluster 0910MLEXH-1 involved 10 isolates from 6 different states: CO(2), CT(1), IA(2), MN(3), MO(1), and NC(1). Of the two Colorado cases, one was hospitalized and developed HUS. There were no deaths.