FDA CORE NETWORK | COORDINATED OUTBREAK RESPONSE & EVALUATION

E. coli O103/Sushi (suspect)/Sep 2023
Executive Incident Summary
CARA # 1192
Date: 1/8/2024

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EXECUTIVE SUMMARY

Notification

On 9/27/2023, CORE Signals was notified by CDC about an *E. coli* O103 cluster (2309OHEXW-1) with a signal for sushi with 7 cases in 3 states: OH (4), SC (2), and TN (1). At the time of notification, 5 cases reported sushi and a subcluster of 3 cases in OH reported consuming food from the same sushi restaurant. Early in the investigation, avocados were pursued as an item of interest with record collection conducted at various points-of-service (POS) reported by cases; however, a common type or brand of avocado was not identified, and avocados were determined to be an unlikely vehicle. Restaurant invoices showed a potential common item received by some POS including whole salmon in sushi reported by cases, which emerged as an item of interest.

Epidemiology Overview & WGS

As of 12/5/2023, the CDC closeout date, this investigation included 12 cases across 5 states: FL (1), MO (1), OH (5), SC (3), and TN (2). All isolates were related within 0-3 alleles by cgMLST. Isolation dates ranged from 8/24/2023 to 10/12/2023 and reported onset dates (n=10) ranged from 8/19/2023 to 10/8/2023. Ages ranged from 1 year to 62 years old with a median of 28 years, and 5/12 (42%) cases were female. Outcome information was available for 11 cases, of which 7 had been hospitalized, and there were no reported deaths. There were no historical outbreaks related to this cluster. The NCBI tree was small and contained no nonclinical isolates.

Epi information at the time of closing was available for 10 cases. Notably, 9/10 (90%) cases reported exposure to sushi at numerous sushi restaurants. All 9 sushi-consumers reported consuming a variety of different rolls, ranging from vegan rolls to raw fish rolls. The one case who did not report consuming sushi did report consuming a raw fish poke bowl purchased from (b)(4). Commonly reported ingredients included: salmon (5/10), tuna (4/10), crab (4/10), sushi rice (10/10), seaweed wrap/nori (8/10), avocado (8/10), and cucumber (6/10).

Field Investigations & Findings

No FDA inspections were requested. CORE issued five investigation assignments related to traceback information collection to various divisions within the FDA Office of Regulatory Affairs Human and Animal Foods. The firms for the assignments included: (b)(4) .

Laboratory Sample Overview

No samples were collected as a result of this investigation.

Traceback Abbreviated Summary

Traceback was conducted on whole salmon for this incident as suggested based on the initial information prepared by investigational partners. Restaurant invoices for fresh produce and fish were requested from all reported sushi restaurants, and records were received from (b)(4) restaurants. Limited convergence was found in the traceback analysis for whole salmon. (b)(4) of the points-of-service (POS) received whole salmon from (b)(4)). (b)(4) POS could have received salmon from (b)(4) , but the more likely supplier based on appropriate timeframes for this fresh item was (b)(4) . (b)(4)

other POS did not receive salmon from (b)(4) . During the traceback investigation, tempura batter mix was identified as another common product received by (b) restaurants in OH and TN. 4/11 cases reported a tempura-fried product, ranging from fried rolls to fried ingredients in sushi rolls, notably all three cases in an OH subcluster which received tempura batter mix from this supplier. Further traceback, however, was not practical given the lack of comprehensive invoices from other restaurants and inability to collect more epidemiologic information given the extended lag since the last case upload.

Product & Firm Actions

No product or firm actions were identified and taken for this incident.

Communications Overview

This incident was added to the CORE investigation table on 11/15/2023. It was closed on the CIT with no vehicle identified.

Conclusions

With the lack of laboratory, traceback, and inspectional evidence, the broad category of sushi remained the suspect vehicle for this outbreak investigation based on epidemiologic evidence alone. Shiga toxin-producing *E. coli* (STEC), such as *E. coli* O103, associated with sushi is an unusual pathogen-commodity pair and the specific contaminating ingredient(s) remain unknown. Questions posed to cases regarding sushi did not ask about tempura or tempura batter exposure, as the questions were focused on sushi. During this outbreak investigation, tempura batter mix was identified as a potential vehicle relatively late and the opportunity to re-interview and/or re-collect appropriate invoices from restaurants were not feasible to thoroughly explore the potential for this vehicle. In future outbreaks with this pathogen-commodity pair, CDC will likely request additional information regarding tempura exposure.

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