

***Listeria monocytogenes* Infections Associated with Pre-packaged Leafy Greens**

May 2020 – December 2021

Multiple counties/Multiple states

On November 2, 2021, the Centers for Disease Control and Prevention (CDC) notified the Minnesota Department of Health (MDH) that they were re-opening *Listeria monocytogenes* cluster investigation 1901MLGX6-1. The cluster had previously been investigated in 2019 and 2020; based on previous findings, pre-packaged leafy greens were an exposure of interest. One Minnesota case with specimen collection in June 2020 was included in the new investigation. The case had refused interview; therefore, no exposure details were available.

Cases were identified through routine surveillance and were defined as individuals with *L. monocytogenes* that was isolated from a clinical specimen and was highly related to the outbreak strain by whole genome sequencing (WGS). Listeriosis cases or their proxies are routinely interviewed about food exposures with a national standard “*Listeria* Initiative” questionnaire, and the de-identified data are provided to CDC.

The United States Food and Drug Administration (FDA) conducted investigations and sampling at multiple leafy green processing facilities.

Minnesota Cases

Two Minnesota cases were identified, a female in her 60s and a male in his 70s. Specimen collection dates were in May 2020 and December 2021. Both cases were hospitalized, for 15 and 11 days, respectively, and recovered. The 2020 case refused to answer exposure questions despite multiple attempts. The 2021 case reported eating lettuce in a house salad from a restaurant chain, and bagged shredded iceberg lettuce of unknown brand purchased from a grocery chain. Isolates from the two cases were 5 single nucleotide polymorphisms (SNPs) different.

This outbreak investigation occurred concurrently with another multi-state *Listeria* outbreak investigation (2110MLGX6-2) linked to packaged salads produced by Salad Brand D. Minnesota did not have any cases in the Salad Brand D outbreak.

National Cases

Eighteen cases from 13 states were identified: IA (2), ID, MD, MI, MN (2), NC, NV, OH (3), OR, PA, TX (2), UT, WI. Illness onset dates ranged from August 16, 2014, to January 15, 2022. Eighty-three percent of cases were female, and case ages ranged from 50 to 94 years (median age, 76 years). All 16 cases with data available were hospitalized, and 3 deaths were reported.

National cases reported a variety of leafy green exposures. Pre-packaged lettuce (6 of 7 cases; odds ratio [OR], 20.3; $p = 0.002$) and pre-made salad (3 of 7 cases; OR, 11.8; $p = 0.02$) were both significantly associated with illness in a case-case analysis conducted by CDC in December 2021. Among 10 total cases interviewed, 9 (90%) reported eating packaged salads; 3 reported Salad Brand A and 1 reported Salad Brand B.

Traceback and Environmental Investigations

In October 2021, a routine retail sample of Salad Brand A garden salad collected by the Georgia Department of Agriculture yielded the outbreak strain of *Listeria*. On October 29, 2021, prior to WGS results linking the sample to the outbreak, Salad Brand A recalled four garden salad mixes with Best If Used By (BIUB) dates of October 25, 2021.

Through targeted outbreak-related retail sampling, the Michigan Department of Agriculture and Rural Development identified the outbreak strain of *Listeria* in a Salad Brand C package of shredded iceberg lettuce, which was produced by Salad Brand A.

On December 22, 2021, Salad Brand A recalled all Salad Brand A -branded and private-label packaged salads processed at its Bessemer City, North Carolina (where the positive sample collected by Georgia was produced) and Yuma, Arizona (where the positive sample collected by Michigan was produced) processing facilities. The recall included 180 products representing 9 brands. Additionally, Salad Brand A temporarily suspended operations at both facilities to conduct cleaning and sanitizing.

Sampling by Salad Brand A identified *Listeria* that was highly related to the outbreak case isolates on equipment used to harvest iceberg lettuce. As a result, on January 7, 2022, Salad Brand A recalled all Salad Brand A -branded and private-label packaged salads processed at its Springfield, Ohio and Soledad, California processing facilities that contained iceberg lettuce. The recall included 72 products representing 6 brands.

Subsequent sampling by Salad Brand A also identified the outbreak strain of *Listeria* on a piece of equipment in their Yuma facility and in packaged salads that were part of the initial recall.

The Minnesota cases isolates were 0 to 8 SNPs different from the food and environmental isolates, according to data in the National Center for Biotechnology Information (NCBI) database.

This was a multi-state foodborne outbreak of listeriosis associated with pre-packaged leafy greens. Illness onset dates for national cases spanned 8 years; the two Minnesota cases occurred in 2020 and 2021. The outbreak strain was identified on equipment used to harvest raw iceberg lettuce. The original source of contamination was not identified. The outbreak resulted in the temporary closure of Salad Brand A processing facilities, as well as multiple large recalls of pre-packaged salads. Equipment and facilities associated with positive products were cleaned and sanitized.

References

1. CDC Outbreak Web Posting. <https://www.cdc.gov/listeria/outbreaks/packaged-salad-mix-12-21/index.html> [Accessed April 19, 2022]
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3. Dole Recall. <https://www.fda.gov/safety/recalls-market-withdrawals-safety-alerts/dole-fresh-vegetables-announces-precautionary-limited-recall-garden-classic-salads-possible> [Accessed February 15, 2022]
4. Dole Recall – NC and AZ Facilities. <https://www.fda.gov/safety/recalls-market-withdrawals-safety-alerts/dole-fresh-vegetables-announces-voluntary-recall-salads-processed-its-bessemer-city-nc-and-yuma-az> [Accessed February 15, 2022]
5. Dole Recall – OH and CA Facilities. <https://www.fda.gov/safety/recalls-market-withdrawals-safety-alerts/dole-fresh-vegetables-inc-announces-voluntary-recall-certain-salads-processed-its-springfield-oh-and> [Accessed February 15, 2022]