



**Salmonella Gastroenteritis Outbreak
Among Patrons of Firefly on Paradise Restaurant – Las Vegas, Nevada
Interim Report 3**

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Updates from the previous interim report are identified by **bold text**.

BACKGROUND

On April 26, 2013, the Southern Nevada Health District (SNHD), Office of Epidemiology (OOE) received reports of gastrointestinal illness from 8 independent groups of patrons of Firefly on Paradise or the adjacent affiliated restaurant Dragonfly on Paradise (Firefly) located at 3900 Paradise Road, Las Vegas, NV 89109. All patrons from these groups ate at the restaurant during April 21-24, 2013. Ill patrons reported symptoms of diarrhea and/or vomiting after they consumed food from Firefly restaurant, and many sought medical care for their illness. In response to these illness reports, the SNHD initiated an investigation.

On April 26, 2013, the SNHD performed investigative inspections and closed Firefly and Dragonfly restaurants to minimize ongoing risk of illness. The SNHD OOE, Environmental Health (EH) and Southern Nevada Public Health Laboratory (SNPHL) have been collaborating on the investigation and response to this outbreak. The Centers for Disease Control and Prevention (CDC), **the United States Department of Agriculture (USDA)**, and the Nevada State Health Division (NSHD) were also notified of the outbreak investigation.

METHODS

Epidemiology

A probable case is defined as illness in a person who consumed food served by Firefly restaurant during April 21-26, 2013, experienced diarrhea (defined as ≥ 3 bouts of loose stools) and/or ≥ 1 episodes of vomiting during a 7-day period after eating, **and reported the illness to SNHD no later than end of day May 13, 2013 (midnight)**. The case definition for confirmed cases was not changed.

Laboratory

SNPHL continued its normal procedures of receiving *Salmonella* isolates from local laboratories and performing speciation and pulsed field gel electrophoresis (PFGE) testing on them. **SNPHL is sending *Salmonella* isolates associated with the outbreak to CDC for multiple-locus variable number tandem repeat analysis (MLVA), a method used to perform molecular**

typing of particular microorganisms to study possible transmission routes and sources of infection.

Environmental Health

After communication with NSHD, USDA's Food Safety Inspection Service (FSIS) plans to perform a trace-back of a cooked food item identified as having been contaminated with the outbreak species of *Salmonella*.

RESULTS

Epidemiology

The epidemic curve as of May 20, 2013 is presented in the figure below and shows a total of **294** people whose illnesses met the case definition (**73** confirmed and **221** probable cases). All identified ill persons ate at Firefly during April 21 through April 26, 2013. Illness onset dates occurred within the April 22 to May 1, 2013 time frame.

From various surveillance data sources, we have received reports of illness from restaurant patrons who normally reside in **27** states and 2 foreign countries (Canada and United Kingdom) who ate at Firefly during their visits to Las Vegas.

Laboratory

As of **May 20, 2013** the following laboratory activities have occurred. In addition to 14 specimens initially collected and tested by SNHD, of which 12 were positive for the outbreak strain of *Salmonella*, local microbiology laboratories have submitted to the SNPHL **83** *Salmonella* isolates obtained from **Clark County residents**. Among them, serotyping and PFGE analyses have been completed on **74** of these samples, with the remaining **9** samples still pending serotyping and PFGE analyses. Of the **74** samples, **61** had PFGE patterns matching the outbreak strain and were from specimens collected from persons whose illnesses met the case definition. These **61** PFGE patterns were sent to CDC's PulseNet program to determine if they are related to other common source outbreaks in the U.S. **To date, PulseNet results have identified no concurrent U.S. cases of salmonellosis matching the outbreak strain other than those linked to the Firefly restaurant.**

SNPHL has sent **6** *Salmonella* isolates to CDC for testing by the National Antimicrobial Resistance Monitoring System (NARMS) program. Results are pending.

SNPHL has sent 49 *Salmonella* isolates to CDC for MLVA. Results are pending.

Of the **21** food items that were analyzed and are shown in the table below, one item, **cooked chorizo (a type of sausage), tested positive for *Salmonella***. Culture and PFGE-pattern results of the *Salmonella* isolate obtained from the cooked chorizo matched those of the outbreak strain. There are no plans to test the remaining 14 food items that were collected on April 26, 2013.

Environmental Health

EH staff contacted Firefly restaurant management to gather more information about the handling of the chorizo product. The chorizo came into the restaurant raw and was subsequently cooked by Firefly restaurant staff. All chorizo items collected from Firefly

by EH and tested (Table) were already cooked by restaurant staff. No raw chorizo was collected by EH in the initial inspection.

Initially, we attempted to trace back some food products that either arrived raw to the restaurant or were served uncooked to patrons to try to identify how a food could have become contaminated at its source or during delivery, storage or preparation. **However, in light of the laboratory result that the outbreak strain of *Salmonella* was isolated from the cooked chorizo, trace-back efforts have been redirected at the chorizo products due to a small possibility that raw chorizo was contaminated prior to arriving at Firefly.**

DISCUSSION

As of May 20, 2013 at least **290** patrons and 4 employees who consumed food and/or drinks at Firefly restaurant during April 21-26, 2013 have been identified to be confirmed or probable cases of *Salmonella* infection. No illness has been reported among staff or patrons of the other Firefly restaurants located in Clark County (Firefly Westside and Firefly on Eastern). **The rate of cases being reported to SNHD has declined significantly with no evidence of any disease transmission after the closure of the restaurant on April 26, 2013. It is possible that the number of cases will change slightly over the next weeks as the last laboratory results arrive that either identify new confirmed cases, or eliminate probable cases from our count should they fail to have PFGE patterns matching the outbreak strain.**

No concurrent cases of salmonellosis having a PFGE pattern matching the outbreak strain have been identified in the U.S. other than those linked to the Firefly on Paradise restaurant.

It is likely that the outbreak was due to local cross-contamination in the restaurant's kitchen and not from a contaminated commercial food.

FUTURE SNHD ACTIONS

No new future actions are planned. The OOE staff will continue to monitor incoming results, assess for case status, and update outbreak statistics as needed. The SNPHL staff will continue to test incoming *Salmonella* isolates submitted by local laboratories, transmit specimens to CDC as appropriate, monitor submissions to PulseNet, MLVA, and NARMS, and report results. The EH staff will continue to center on enforcing safe food storage and handling practices by the restaurant management and staff and **to monitor the results of the USDA FSIS food trace-back investigation.**

RECOMMENDATIONS

Based on a review of all evidence to date, the SNHD is making no changes to the recommendations made in Interim Report #2 (May 10, 2013). The SNHD continues to work with the restaurant management to implement all corrective actions required for reopening the restaurant.

FIGURE AND TABLE

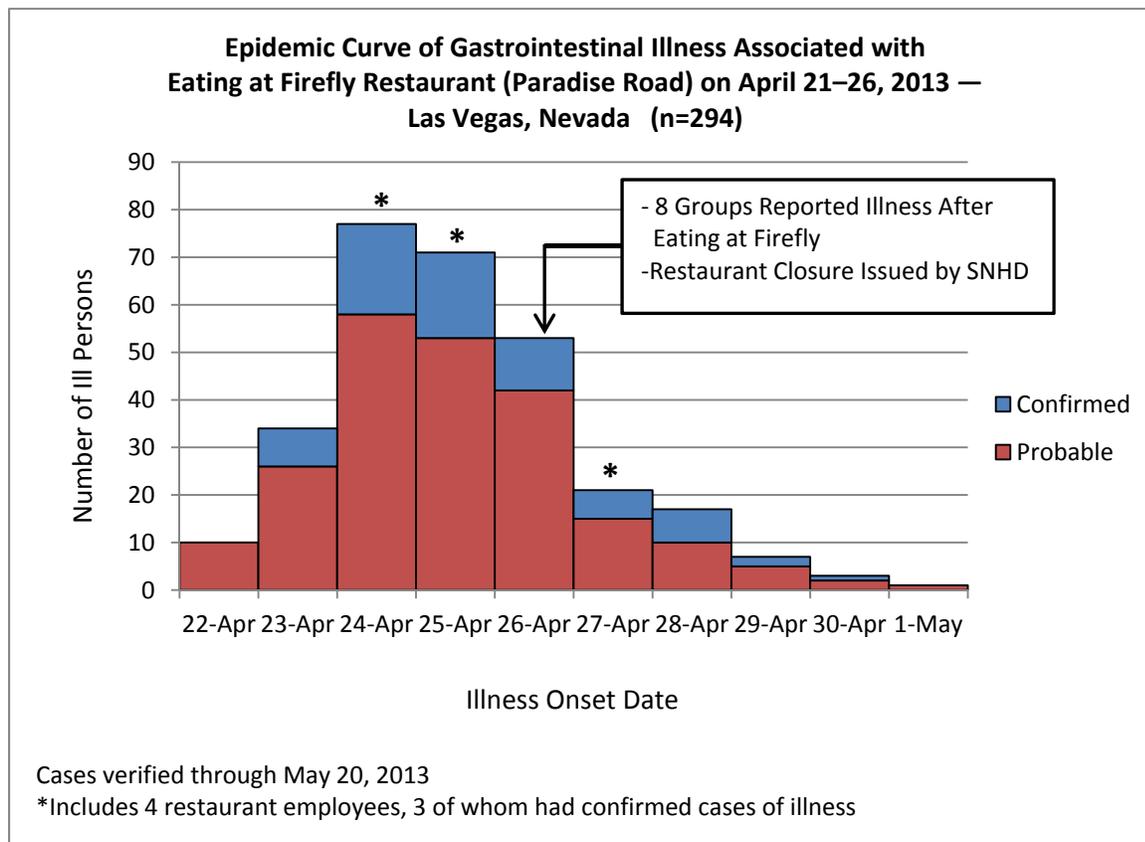


Figure. The number of cases (n=294; Confirmed=73 and Probable=221) by illness onset date reported through May 20, 2013. Ill persons ate during April 21-26, 2013. Illness onset dates occurred during April 22–May 1, 2013. Firefly on Paradise restaurant. Las Vegas, Nevada.

Table. Food samples collected (n=35) by Southern Nevada Health District Environmental Health Division from Firefly on Paradise and Dragonfly on Paradise restaurants on April 26, 2013.

Firefly on Paradise Restaurant (N=20)	Dragonfly on Paradise Restaurant (N=35)
Tetilla*	Aioli sauce*
Calamari*	Blanched fries*
Chorizo 1*	Calamari*
Chorizo 2, cooked*	Chorizo*
Cooked pasta	Eggplant
Cooked rice*	Heavy whipping cream
Cut cooked potatoes	Parmesan*
Cut cooked potatoes 2	Rice
Garlic cream sauce*	Shrimp
Garlic cream sauce 2*	Stuffed mushroom*
Garlic in oil*	Tartar sauce*
Lentils	Tempura batter*

Macaroni and cheese*

Mussel sauce*

Mussel sauce 2*

Potato bravas

Salsa verde

Shrimp, raw

Stuffed mushroom*

Tomato sauce

Tuna*

Tuna 2

Tuna skewer

* Samples sent (N=21) to the Nevada State Public Health Laboratory as of **May 20, 2013**.
Bolded food item was positive for *Salmonella* species.