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## Gastroenteritis Associated with Consumption of Fiddlehead Ferns — Anchorage, May 2010

### Introduction

On May 13, 2010, the Anchorage Department of Health and Human Services' (DHHS) Food Safety and Sanitation Program received two calls from persons reporting gastrointestinal illness following a buffet luncheon held on May 11 at an Anchorage food facility (Facility A). DHHS public health nurses and environmental health specialists began an investigation.

### Methods

A retrospective cohort study was performed to determine risk factors for illness. A case was defined as new onset of diarrhea or vomiting in a person within 12 hours after eating at the Facility A buffet luncheon on May 11. Lists of persons who ate from the buffet were obtained. Questionnaires were sent by email to patrons and provided in hardcopy to employees. Responses were analyzed using Epi-Info version 3.5.1. Stool specimens were collected from four ill persons for enteric bacterial pathogen testing. Environmental health specialists inspected Facility A's food storage and kitchen facilities, and reviewed how foods and beverages were stored, prepared, cooked, and served at the luncheon. Cleaning and sanitization procedures used at Facility A were also reviewed. Information about the suppliers of the foods and beverages served at the luncheon was obtained.

### Results

Twenty-four (100%) Facility A employees and 47 of 87 patrons (54%) responded to the questionnaire. Of those responding, five did not eat buffet food. Of the 66 persons who ate buffet food and/or beverages, 38 (58%) met the case definition. Their symptoms included diarrhea (92%), nausea (71%), abdominal cramping (47%), bloating/gas (37%), chills (24%), headache (21%), vomiting (16%), fever (13%), and blood in stool (3%). The median onset time after eating was 2 hours (range: 0.5–6 hours). The median duration of symptoms was 16 hours (range: 0.25–120 hours). Consumption of the fiddlehead fern salad was strongly associated with illness (Table); of the 38 persons who ate the fiddlehead fern salad, 37 (97%) met the case definition.

**Table. Risk Ratios for Buffet Foods and Beverages Served at Facility A — Anchorage, Alaska, May 2010**

	Risk ratio	95% CI*
Fiddlehead fern <sup>†</sup> salad	12.8	1.9, 86.5
Chicken with fruit salsa	1.4	0.9, 2.2
Water	1.3	0.8, 2.0
Mixed heated vegetables	1.3	0.8, 1.9
Roasted potatoes	1.2	0.8, 1.8
Coffee	1.2	0.8, 1.8
Ice tea	1.2	0.8, 1.9
Dessert	1.1	0.7, 1.8
Beef tenderloin	1.0	0.6, 1.5
Rolls	0.9	0.5, 1.3
Green salad	0.9	0.6, 1.4
Fruit salad	0.8	0.5, 1.3

\*95% confidence interval

<sup>†</sup>Fiddlehead ferns are the tightly-coiled fronds of young ferns harvested in the spring for consumption.

### Laboratory Investigation

All four stool samples were negative for common enteric bacterial pathogens (e.g., *Campylobacter* spp., *Salmonella*, Shiga-toxin producing *Escherichia coli*, and *Shigella*).

### Environmental Investigation

No deficiencies were noted in the cleaning process, equipment, food handling, or sanitary conditions of the kitchen. No food items from the buffet were leftover for testing. The ferns were washed in a sanitizing solution, steamed for approximately 5 minutes, spun in a salad spinner, and chilled in vinegar. Almonds, oil, and herbs were added later. Many ill persons reported that the ferns tasted "raw" and/or "crunchy."

The distributor who supplied the fiddlehead ferns did not have any of the fern product remaining. The ferns had been collected from the wild in British Columbia (BC), washed and packaged in Vancouver, BC, transported to a distributor in California, and then shipped to Anchorage. The BC packaging company includes a health advisory label on its small retail packages of ferns. The bulk bags sent to the distributor do not include this label.

### Discussion

This outbreak of acute gastroenteritis was associated with consumption of fiddlehead ferns that were harvested in Canada and purchased by Facility A through a retail distributor. The signs and symptoms of the current outbreak were consistent with outbreaks of fiddlehead fern-associated gastrointestinal illness that were recently reported in New York and Canada.<sup>1,2</sup> These investigations concluded that some fern species contain an unidentified heat-labile toxin which is responsible for causing gastrointestinal illness. No tests are currently available to determine the presence of the toxin.

Cooking fiddlehead ferns (e.g., boiling for 10–15 minutes) reduces the risk of gastrointestinal illness.<sup>1,3</sup> Symptoms of illness typically appear within 30 minutes to 12 hours after eating raw or undercooked fiddleheads. Illness generally lasts <24 hours, but can last up to 3 days. When picking fiddleheads in the wild, it is important to be familiar with the various species because some fiddleheads are unsafe to eat. For example, Bracken Ferns are known to contain carcinogenic compounds.<sup>4</sup> The Ostrich Fern, which is found in Alaska and Canada, is considered one of the safest fiddleheads to consume.<sup>4</sup>

### Recommendations

1. Suspected outbreaks of gastrointestinal or any other illness should be reported to the Alaska Section of Epidemiology at (907) 269-8000, or if in Anchorage to DHSS at (907) 343-4799.
2. Fiddlehead ferns should be cleaned thoroughly and boiled for 10–15 minutes or steamed for 10–12 minutes (until tender) prior to consumption, and water used for cleaning or steaming fiddleheads should be discarded.<sup>1,3</sup>

### References

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