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## Outbreak of Scombroid Poisoning — Anchorage, 2008

### Introduction

On January 18, 2008, at 2:30 PM, the Municipality of Anchorage Food Safety and Sanitation Program (MOA FSS) received a call from an Anchorage restaurant (Restaurant A) manager to report a suspected foodborne outbreak. Several persons complained of symptoms consistent with scombroid poisoning after consuming baked mahi mahi. Local and state public health officials were notified. Remaining portions of mahi mahi were obtained and sent to a U.S. Food and Drug Administration (FDA) Laboratory in Washington for testing.

### Cases of Illness

Two males, aged 48 and 25 years, were evaluated in an Anchorage Emergency Department (ED) shortly after eating mahi mahi at Restaurant A. One person presented with a “hot feeling,” diarrhea, weakness, blurred vision, hypotension and tachycardia. The second presented with a “racing heart” and a generalized pink rash. An astute emergency physician recognized the illnesses as likely scombroid poisoning associated with eating mahi mahi. The first patient was hospitalized for 2 days. The second patient improved with intravenous hydration, diphenhydramine, and methyl-prednisolone, and was discharged to home from the ED. One other person reported “similar symptoms” to the restaurant manager, but did not seek medical attention.

### Environmental Investigation

The Restaurant A manager removed all cooked mahi mahi from the cook line after approximately 40–60 meals had been served. The manager then contacted MOA FSS, who notified the Anchorage FDA office. Anchorage FDA staff performed the local environmental investigation and alerted regional FDA staff, who gathered information from the Washington mahi mahi supplier and distributor.

The fish, believed to be by-catch from a tuna long-line vessel, originated from Taiwan and were routed through Washington to Alaska on December 14. Aside from Restaurant A, it appeared that no other Alaska food establishments had received this product.

Washington-based FDA staff interviewed the supplier and distributor, and collected samples of the same lot number from the distributor for testing. The supplier no longer had fish from that lot available; however, histamine testing performed in October 2007, when the lots were originally received, showed histamine levels to be <25 ppm, which is satisfactory.

At Restaurant A, the fish was stored frozen until January 15, when it was taken into a refrigerated storage room to thaw. The following day, the fillets were placed under cold running water to complete thawing, sliced, and then placed on trays with marinade. On January 18, the fish trays were removed from the refrigerator and baked. Temperatures in the freezer, store room, cooking and holding containers, and thawing sink were all adequate based on logs.

### FDA Testing Results

An FDA sanitarian performing a sensory evaluation of both cooked and frozen product from Restaurant A scored the fish in the 46–49 range (a score of 0–49 is considered passable; a score of 51–99 is not passable), meaning that the fish was of low quality but not decomposed. Both cooked and frozen portions were also found to have elevated levels of histamine (Table).

Table. Histamine Results for Mahi Mahi Samples

Source	Histamine (ppm)*
Restaurant A	
• Cooked portions	168
• Frozen fillets (2 of 6 were elevated)	150, 172
Washington distributor	
• Frozen fillets (3 of 6 were elevated)	141, 147, 158

\*Acceptable level <50 ppm

### Discussion

Scombroid poisoning usually results from eating food with high histamine levels, but similar illness may occur from the presence of other vasoactive amines. Histamine and other amines are formed by the action of decarboxylase enzymes produced by certain bacteria on histidine and other amino acids in food. Illness may occur not only after consumption of fish in the Scombridae family (e.g., tuna and mackerel), but also non-Scombridae fish (e.g., mahi mahi and sardines) and other foods (e.g., Swiss cheese) that contain the appropriate amino acids and are subject to bacterial contamination and growth. Maintaining temperatures below 40°F is critical to preventing histamine production.<sup>1</sup> Once present, cooking does not appreciably change the histamine content in food.

Since the environmental investigation did not identify a primary food-handling infraction that was clearly responsible for the high histamine levels in the mahi mahi, it is likely that the decomposition of the implicated fish was a cumulative process resulting from temperature abuse that may have started shortly after the fish was caught.

Scombroid poisoning presents like an allergic or anaphylactic reaction, with symptom onset usually occurring within 30 minutes. Treatment is supportive, and patients are frequently treated with intravenous fluids and anti-histamines. The need for vasopressors is rare, although the patient who was hospitalized did require vasopressor therapy for hypotension that persisted despite aggressive intravenous fluid therapy. Epinephrine is not routinely used. Symptoms typically resolve within 12 hours. Among persons with underlying medical conditions or those taking medications that interfere with histamine metabolism (e.g., isoniazid), scombroid poisoning may result in more serious illness.

The last confirmed and reported scombroid outbreak in Alaska occurred in 1995,<sup>2</sup> although unreported cases might have occurred since then. Scombroid poisoning is not reportable to SOE; however, health care providers should report outbreaks or clusters of any unusual illness, especially those that involve common exposures.

### Recommendations

1. Health care providers should consider scombroid poisoning in patients with possible anaphylactic reactions and recent history of fish consumption.
2. Health care providers seeing patients suspected to be part of a cluster of illness should contact SOE at 907-269-8000 during business hours or 1-800-478-0084 after hours.
3. Contact the Alaska Dept of Environmental Conservation (DEC) at 907-269-7501 or MOA FSS at 907-343-4200 for information about safe fish storage and handling practices.

### References

1. FDA Hazards and Controls Guidance: Scombrototoxin (Histamine). Available at: <http://www.cfsan.fda.gov/~comm/haccp4g.html>.
2. Gessner BD, Hokama Y, Ito S. Scombrototoxicosis-like illness following the ingestion of smoked salmon that demonstrated low histamine levels and high toxicity on mouse bioassay. *Clin Infect Dis* 1996;23:1316-8.