

Prevention

Strategies for controlling foodborne botulism fall largely into two approaches: (1) reducing contamination of food with *C. botulinum* spores and preventing toxin production in food; and (2) early identification of botulism cases. Reducing contamination and preventing toxin formation are difficult to achieve. Botulism spores, particularly type E, are ubiquitous in Alaska and traditional Alaska Native food preparation practices will not always prevent toxin production.

Shaffer et al. described Alaska Native food consumption patterns and preparation practices in the Bristol Bay region in 1987.⁴³ In four Yupik villages, they found that aged foods were regularly prepared by 15% of high school students, 71% of the students' parents, and 80% of their grandparents. Aging practices appeared to have changed from the traditional method of using a clay pit in the ground. Only 13% of the preparers reported that they used the traditional method to age fish heads while 42% used a wooden barrel above ground, 38% used a wooden barrel in the ground, and 8% used a plastic bucket above ground.

Another survey performed in 1999 by the CDC's Arctic Investigations Program (AIP) based in Anchorage, Alaska, assessed whether educational messages could be tailored to decrease the risk of botulism from consuming traditional foods. The survey examined the knowledge, attitudes, and practices of a sample of Alaska Natives in the Bristol Bay region, and found that knowledge and awareness of botulism was relatively high. Almost half the respondents (total of 140) indicated they would consider eating traditional foods that had been boiled to reduce toxin, or consider *not* eating foods that had been prepared without the use of a refrigerator, or by methods that allow for an anaerobic environment.²⁹

The results from the 1999 survey were used to create an educational video in 2000.⁴⁴ In conjunction with the video, safe food preparation steps were developed (Table 13). This video was then distributed to all rural schools and medical facilities in Alaska in the spring of 2000. Approximately a decade earlier, a similar video was produced by the Inuvik Regional Health Board in the Northwest Territories, Canada.⁴⁵ A follow-up survey for the Canadian video was not done.

Table 13. How to protect your family from botulism: five food safety steps.*

The following five food safety steps are recommended for persons who prepare or eat traditional aged foods:

1. Try to use traditional methods for preparing Alaska Native foods as these may decrease the presence of botulism bacteria in food. Plastic, glass, or sealed plastic bags do not allow air to reach the food and can promote the growth of *C. botulinum* bacteria. Use salt to preserve dried fish and to also discourage growth of *C. botulinum* bacteria.
2. Age food at a cold temperature, ideally below 36° Fahrenheit (or 2° Celsius). This will also discourage the growth of *C. botulinum* bacteria.



3. Before preparing food, wash your hands, your containers, and your food.
4. Cook your food before eating it. Heat destroys botulinum toxin and may be the best way to reduce the risk of getting botulism after eating aged foods.
5. **When in doubt, throw it out!** Don't take the risk of getting botulism if you don't know how the food was prepared. Botulinum toxin is so deadly, even a small taste can make you ill.

For more information about preventing botulism, or to order an educational video or brochure, visit the Public Health Training Network website:
www2.cdc.gov/phtn/botulism/default/default.asp.

*Adapted from CDC "A Helping Hand: Keeping Your Family Safe from Botulism."⁴⁴

In 2001, AIP conducted a follow-up survey to evaluate the effectiveness of the Alaska video.⁴⁶ Approximately 40% of the 254 adults interviewed had watched the video. Most had seen the video at home or in a health care facility. No changes were documented between consumption and preparation practices between the pre- and post-viewing surveys. Because of the relatively small number of persons who had watched the video, assessing the effect of the video was difficult.

In past situations involving recalls of commercial food products suspected or confirmed to be contaminated with botulinum toxin, the CDC and FDA have recommended that consumers take care when handling potentially contaminated foods.⁴⁷ Such steps include ensuring that other people or animals do not have access to the foods by discarding the foods in sealed containers and cleaning up liquid foods in a manner to avoid direct contact with a person's mucous membranes. In Alaska, once a food has been confirmed to have associated with an outbreak, the Section of Epidemiology recommends the food be discarded and surfaces or containers that were in contact with the food washed in a dilute bleach solution; hands and clothing can be washed with soap and water.⁴⁸

Educating health care providers to recognize botulism early in its clinical course and to report cases promptly has proved effective in limiting adverse outcomes.

Educational efforts directed toward eliciting a careful food consumption history, having a high level of suspicion when confronted with an illness with gastrointestinal and neurologic symptoms, and using the "diagnostic pentad"

to prompt suspicion of botulism as a possible differential diagnosis, have been the mainstay of control efforts in Alaska. These educational efforts combined with rapid epidemiologic investigation of suspected cases, prompt supportive care, and the availability of botulism antitoxin may be responsible for the reduction in the number of fatalities.

