

Food Safety and You: **FOODBORNE BOTULISM**



What Is Foodborne Botulism?

Foodborne botulism is a rare but serious illness caused by eating foods that contain neurotoxins produced by the bacteria *Clostridium botulinum*. The botulinum toxin can affect the central nervous system and cause muscle weakness, paralysis and even death.

In the United States, an average of 21 cases of foodborne botulism are reported each year. Most of them are associated with home-processed and home-canned foods, especially low-acid foods such as vegetables, seafood, meats and poultry.

How Does the Bacteria Get in Our Food and What Foods Are Risky?

C. botulinum is found in soil and marine sediments worldwide, most commonly existing as bacterial spores. *C. botulinum* form spores when they are stressed in poor survival conditions. *C. botulinum* spores are found everywhere, including the surfaces of fruits, vegetables and seafood.

C. botulinum has been linked to a variety of foods, including home-canned foods, unrefrigerated homemade salsa, baked potatoes sealed in aluminum foil, garlic or spices infused oil and traditionally prepared fermented fish.

Why *C. botulinum* Is Challenging?

- *C. botulinum* can live and grow in low-oxygen conditions. Canned foods, garlic or spices infused oil or foil wrapped baked potatoes provide suitable conditions for *C. botulinum* to grow.
- When it is stressed under adverse conditions, *C. botulinum* forms spores. Spores are a form of dormant bacteria that wrap themselves with protective membranes and a hard coating. The spores are extremely resistant even under tough environmental conditions.
- *C. botulinum* spores can be found widely and can survive for years. When the conditions allow, spores can germinate to become *C. botulinum*.

What Are the Symptoms of Foodborne Botulism?

After botulinum toxins are ingested, the symptoms generally start with nausea, vomiting and dizziness. They can progress to a series of neurological symptoms such as double vision, blurred vision, difficulty speaking and swallowing, muscle weakness and difficulty in breathing, which may lead to asphyxia and cause death.

What Is the Best Way To Prevent Foodborne Botulism?

Foodborne botulism is caused by a three-stage reaction starting with the germination of spores, then the growth of *C. botulinum* and the production of botulinum toxin. Thus, prevention of foodborne botulism needs to target one or more of these stages. Temperature and pH (acidity of foods) are critical tools to prevent illness.

- Low-acid foods must be canned using pressure canner. Tomatoes can be canned in a boiling water canner if extra acid is added to ensure safety. Otherwise, tomatoes also should be pressure canned.
- Follow the U.S. Department of Agriculture or Cooperative Extension Service guidelines for home canning, especially for tomatoes and low-acid foods such as vegetables, meats, poultry and seafood.
- Before consuming home-canned foods, especially low-acid foods, boil them to lower the potential risk of botulinum toxin.





- Keep hot food hot and cold food cold. If you leave the food in the temperature danger zone (40-140 degrees Fahrenheit) for two hours, consume or further process the food immediately. If more than four hours, discard the food.
- Keep homemade salsa or other foods containing low-acid ingredients in the refrigerator. Keep your refrigerator temperature at 40 degrees Fahrenheit or lower.
- When in doubt, throw it out. When you open the container, inspect the product. Do not use products with abnormal color, smell or texture. Do not taste the product to determine if it is safe.

What Should I Do if I Ate the Suspected Food?

- Seek medical care if you experience any botulism symptoms. Symptoms of botulism usually appear within 12 to 36 hours after eating food containing the neurotoxin, although there have been documented cases where the onset of illness ranged from four hours to eight days.
- Report any questionable food products to your local health department.
- If it is related to the safety of meat, poultry or egg products, call the USDA's Meat and Poultry Hotline (1-888-674-6854) for further instructions.

References

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