

CLOSTRIDIUM BOTULINUM

(kläs-trid'-e-um) (bot'yū-lin-um)

Overview

Botulism, which is caused by *Clostridium botulinum* toxin, is one of the rarest types of foodborne illnesses, but it's also one that should be taken seriously. Under the right conditions, *Clostridium botulinum* bacteria can produce a toxin that can affect the nervous system. Eating foods that contain this toxin causes the illness botulism. One of the most severe foodborne illnesses, botulism can be fatal if untreated.

Sources

Clostridium botulinum is widespread in the environment, occurring in soil, water and animals. As a result, various foods may naturally contain these bacteria, which form resistant cells (called "spores") that can survive many cooking processes. Even though *Clostridium botulinum* is widespread, foods **only** become dangerous when *Clostridium botulinum* grows and produces its toxin in the food. These bacteria are anaerobic, meaning they only grow where there is little or no oxygen. They are also sensitive to acid and cold, and usually cannot grow and produce toxin in acidic foods or in the refrigerator.

Infants younger than 12 months have an increased risk of developing botulism. Because their digestive systems are not well developed at this age, *Clostridium* spores found in certain foods can grow in an infant's digestive system and produce the toxin in the body with serious, often life-threatening effects. Raw honey is the most frequent cause of infant botulism, and infants younger than 12 months should not be fed honey.

Foods that have been associated with outbreaks of botulism include improperly canned foods (both homemade and commercially canned), flavored oils containing garlic and herbs, smoked and salted fish, and potatoes that have been baked in aluminum foil and then kept (still wrapped in foil) at room temperature for several

hours. All of these are low-acid foods that are usually stored at room temperature in the absence of oxygen. Another environment where *Clostridium botulinum* can grow is on the surface of fresh vegetables wrapped tightly in plastic (which keeps out oxygen). This is why supermarket vegetables are loosely wrapped with plastic packaging that has holes in it to allow the oxygen to pass through.

Symptoms/Complications

Early symptoms of botulism include double and blurred vision, slurred speech, difficulty in swallowing, dry mouth, drooping eyelids and muscle weakness. Symptoms can begin any time within six hours to 10 days, but usually within 18 to 36 hours after eating the contaminated food, and if untreated can lead to paralysis of the arms, legs, trunk and respiratory muscles. If respiratory failure occurs, intensive medical care will be needed. Respiratory failure can be fatal, and anyone who experiences these symptoms should seek medical help immediately.

Control Measures

Botulism can be prevented by practicing safe food handling techniques and looking for warning signs in food packaging. Visible indicators such as bulging or dented cans, clear liquids that have turned milky and cracked jars can indicate that *Clostridium botulinum* could be present.

These foods should be disposed of immediately and never tasted or eaten! To prevent botulism when home canning, follow recommended USDA home canning methods, and pay special attention to adding the correct amount of acid required and processing times and temperatures. High temperatures destroy *Clostridium botulinum* toxin, so make sure to heat home canned meats and vegetables to boiling (at least 15 minutes) before serving. To prevent the growth of *Clostridium botulinum* in other foods, refrigerate oils infused with herbs, keep wrapped baked potatoes above 140°F until served, and avoid storing fresh fruits and vegetables in an airtight container at room temperature. Since *Clostridium* spores can withstand ordinary cooking, cooked foods also should be refrigerated and not left at room temperature unless they will be eaten soon.

Resources

For further information, contact:

The American Dietetic Association
Consumer Nutrition Hotline
(800) 366-1655
(recorded messages, fact sheets
and referrals to dietitians)
<http://www.eatright.org>

Centers for Disease Control
and Prevention
Foodborne Illness Line
24-hour recorded information
(888) 232-3228
<http://www.cdc.gov>

FDA Center for Food Safety
and Applied Nutrition
Food Safety Line
24-hour recorded information
(800) 332-4010
<http://vm.cfsan.fda.gov>

National Cattlemen's
Beef Association
<http://www.beef.org>

National Food Safety Database
<http://www.foodsafety.org>

National Restaurant Association
<http://www.restaurant.org>

National Restaurant Association
Educational Foundation
<http://www.edfound.org>

Partnership for Food Safety Education
Fight BAC![®]
<http://www.fightbac.org>

USDA Meat and Poultry Hotline
Mon – Fri, 10am – 4pm ET
(800) 535-4555
<http://www.fsis.usda.gov>
<http://www.foodsafety.gov>

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