

Foodborne Botulism

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What is Food borne Botulism?

Botulism is a potentially fatal paralytic illness caused by a toxin (poison) that is produced by a bacterium called *Clostridium botulinum*. Foodborne botulism happens when a person consumes a food in which *Cl. botulinum* has been able to grow and produce toxin.

What are the symptoms of botulism?

Classic early symptoms are double and/or blurred vision, drooping eyelids and slurred speech. This progresses to difficulty swallowing and muscle weakness. These symptoms are caused by the botulinum toxin causing muscle paralysis. If untreated symptoms progress to paralysis of the arms and legs and muscles that help you to breathe. Respiratory failure generally causes death in untreated individuals. Symptoms generally begin 12 to 36 hours after consuming the toxin in food but in rare cases symptoms can occur as early as 6 hours or as late as 2 weeks after exposure. Most people recover from botulism but the recovery period can take months. In rare cases people do die but generally they are people who's symptoms progress without treatment.

What is *Cl. botulinum*?

Cl. botulinum is a bacterium that is all around us in soils and the environment. It survives difficult conditions by forming spores that are resistant to heat, chemicals and drying. Under favourable conditions the spores develop into bacteria (germination) and the bacteria grow in the food. During growth they produce a potent neurotoxin (nerve toxin called botulinum toxin) that causes the illness.

There are different forms of *Cl. botulinum* designated by their toxin type. Generally it is types A, B and E that affect humans. Rarely, other types like F and G have affected humans. Type A and B for example grow best between 30°C and 40°C and can't grow below 10°C, whereas type E can grow under chill conditions (as low as 3.3°C). *Cl. botulinum* does not like oxygen and therefore grows in the absence of air. This is called anaerobic growth. It also doesn't like acidic foods and will not grow below pH 4.6.

How is this pathogen controlled in foodstuffs?

Control of *C. botulinum* in foods requires destruction of the spores through processing (e.g. effective canning at high temperatures for long periods of time) or prevention of bacterial growth through product formulation (e.g. keeping pH below 4.6, reducing the amount of available water), temperature control, or a combination of these factors. Failure of one or more of these control measures, (e.g. cans not being heated sufficiently to kill the spores of *Cl. botulinum*) may enable the organism to grow and produce the toxin in the food.

What foods are at risk?

Foods that are not acidic (above pH 4.6), have enough available water and have little or no air in them (e.g. certain canned or jarred foods) are susceptible to *Cl. botulinum* growth. Outbreaks have been recorded in canned food, jarred foods in oil, some fish products and meat/blood sausages amongst other foods. Nearly always, there is a failure of processes like heat or acidification during the production of foods that would normally be expected to make the food safe. Sometimes post-heat process contamination is responsible.

Does cooking kill *Cl. botulinum* and its toxin?

Normal thorough cooking (pasteurisation: 70°C 2min or equivalent) will kill *Cl. botulinum* bacteria but not its spores. To kill the spores of *Cl. botulinum* a sterilisation process equivalent to 121°C for 3 min is required. The botulinum toxin itself is inactivated (denatured) rapidly at temperatures greater than 80°C .

Are there obvious signs of these bacteria in foods?

Not always. Foods contaminated with *Cl. botulinum* do not generally look, taste or smell any different from uncontaminated foods.

Can the toxin be spread from person to person?

Person to person transmission of botulism does not occur.

Is botulism common in Ireland?

No. Between 2004 and 2009 there have been only nine reported notifications of botulism in Ireland. For further information please see www.hpsc.ie (<http://www.hpsc.ie>)

What is infant botulism?

Please see the following: http://www.fsai.ie/faq/infant_botulism.html ([/faq/infant_botulism.html](http://www.fsai.ie/faq/infant_botulism.html))

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