



No. 34 Sick waterbirds

Botulism affected waterbirds

Cases of botulism amongst waterbirds may occur throughout the State at any time of year. Large outbreaks usually only develop in south-west Western Australia during the summer and autumn months. When outbreaks occur, large numbers of birds may be affected.

Botulism affects both birds and mammals, and is a form of bacterial poisoning, not an infection. It is caused by the chemical toxin produced by the bacterium *Clostridium botulinum*. The bacterium itself does not invade the living tissues of its victim.

There are many types of botulism and Types C and E affect birds. Type C toxin affects waterfowl, shorebirds, colonial waterbirds and other birds. Type E toxin affects gulls and other fish-eating birds.

Each of the cells of *C. botulinum* can form a spore highly resistant to physical and chemical agents. It may lay dormant in this form for many years. When conditions are favourable: suitable temperature, an organic medium to satisfy food requirements, and an absence of atmospheric oxygen; the spores germinate and multiply. In so doing, they produce a potent nerve toxin as one of the end products of their metabolism.

A bird becomes affected by swallowing the toxin (usually in food containing the bacterium) and absorbing it through the lining of the digestive tract. The toxin reaches the peripheral nervous system by way of the blood stream. In a manner not yet clearly understood, it attacks the nerves and causes paralysis of the respiratory system and ultimately death.

Most species of bird that occur on or near botulism-producing marsh areas have been affected at some stage by botulism, and the degree to which they are affected can be explained largely by the nature of their feeding habits. Most marshes and lakes where outbreaks occur are shallow and slightly alkaline. The bacterium requires anaerobic conditions: these often occur during 'algal blooms' or when plants die off in shallow lakes at the end of summer. The resulting decomposition of the algae takes oxygen out of the water and causes anaerobic conditions. The same is true, on a smaller scale, of excess bread fed to ducks on metropolitan lakes.

Botulism is usually a warm weather disease. Although the toxin is denatured quickly by temperatures above 80 C, it apparently also loses its potency slowly in normal sunlight.

Botulism in humans

Botulism in humans is usually the result of eating improperly home-canned foods, which contain Types A or B toxin. Type E toxin has been associated with improperly smoked fish. People, dogs, and cats are generally thought to be resistant to Type C toxin, but a few cases have been reported in people and dogs. Thorough cooking of food destroys botulism toxin.

What can we do to help?

Outbreaks of botulism occur throughout the world when seasonal conditions favour the growth of the organisms. No known spray would be selective enough to kill the causative organisms and not kill the harmless and beneficial ones. There are no reasonable avoidance measures, besides attempting to prevent eutrophication of waterbodies.

If lakes become more eutrophic than they are currently (i.e. the level of nutrients, particularly phosphorus, from fertiliser run-off, septic tanks etc., becomes higher), botulism and deaths associated with algal blooms will become more common.

Many kinds of medication have been tested and none except an antitoxin for botulism, have any beneficial effect.

Symptoms of poisoning

Early

- Birds generally found trying to leave water but unable to stand for any length of time.
- Feathers have a fluffed appearance and wings are not crossed above the tail.
- Generally can still propel themselves rapidly across water using wings.

Later

- Totally lethargic.
- Almost total wing paralysis.
- Total leg paralysis.
- Neck weak and birds have difficulty keeping head erect.
- May open and close beak to breathe.

- Nictitating membrane (the inner or third eyelid) sluggish.
- Dilation reflex of the eyes slow.

Advanced

- Nictitating membrane non-functional.
- Legs and wings totally paralysed.
- Total neck paralysis.
- Dilation reflex of the eyes very slow.

- Bird frequently gasping for air due to partial paralysis of respiratory muscles.
- Throat, upper and lower air passages possible fouled with thick white opaque mucus.
- Swallowing reflex affected.
- Bowel movement may be affected. In normal droppings bird urine is white and bowel matter dark. Green is abnormal.

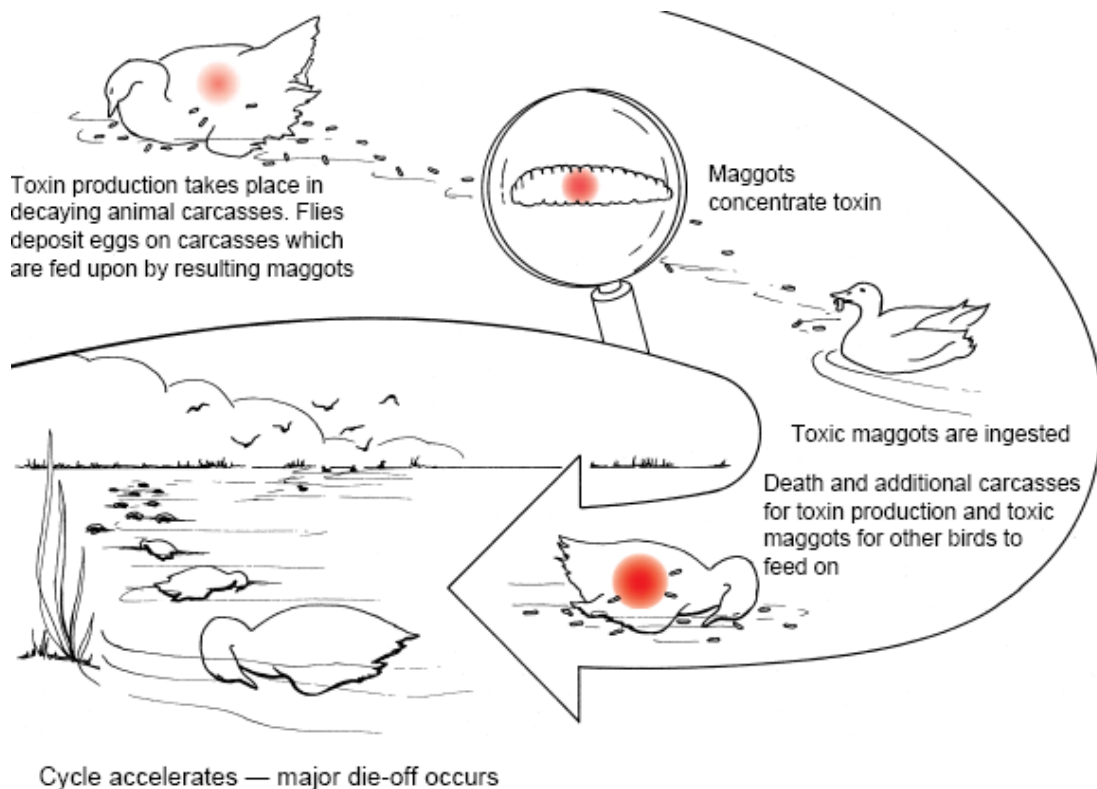


Figure 1 Carcass-maggot cycle of avian botulism (image taken from Friend and Franson (1999-2001)).

Caring for botulism affected birds

Providing mildly affected birds with fresh water, shade and protection from predators may help them recover from the intoxication. Botulism antitoxin is available but requires special handling and must be given early in the intoxication. Birds that survive a botulism outbreak are NOT immune to botulism toxin.

If you find an injured or orphaned native waterbird, call this 24-hour / 7 day per week Wildcare helpline number:

WildCare (08) 9474 9055

Avian influenza

Based on surveillance of wild birds and investigations of bird deaths, there has not yet been a recorded case of migratory birds visiting Australia suffering or carrying antibodies to the H5N1 strain of avian influenza. It is believed that the isolation of Australia and the great distances migratory birds need to fly to get here provide a significant barrier to sick birds surviving to infect others here.

It is important, in relation to the H5N1 virus, to remember that although waterfowl are the natural hosts and normal spreaders of avian influenza, Western Australia is not on the usual flight path of any migratory waterfowl (ducks, geese, swans). Furthermore, no waders or shorebirds that do fly to Western Australia have tested positive to the H5N1 virus. While there are real threats in respect of the possible introduction of avian influenza, particularly if it becomes established in the human population in Asia to any significant extent, current thinking is that our migratory birds pose very minimal risk.

The Department of Environment and Conservation (DEC) is supportive of efforts to limit the likelihood of the introduction of avian influenza to Australia. The Australian Quarantine and Inspection Services (AQIS) and the National Wildlife Health Network, in cooperation with State agencies, are conducting bird surveillance, monitoring and awareness programs as part of our State's biosecurity efforts. General surveillance relies heavily on networks that include people in the poultry and other bird industries, DEC Wildlife Officers, bird watchers and others.

The Western Australian Department of Agriculture and Food operates border security for weeds, pests and animal and plant diseases and has formulated protocols for the investigation of dead birds. The Department of Agriculture and Food protocol states that a Department of Agriculture Veterinarian should be contacted in any of the following cases:

- Deaths of six or more juvenile waterbirds.
- Deaths of five or more waterbirds.
- Deaths of three or more adult waterbirds.
- Waterbird deaths that occur within a locality such as a lake.
- Waterbird deaths that occur in quick succession (3-5 days apart).

Cases which meet these criteria should be reported to the:

Duty Pathologist at the Department of Agriculture and Food on 9368 3351 or the Emergency Disease Hotline on 1800 675 888 or AQIS National freecall 1800 803 006 or AQIS Perth (08) 9334 1555.

References

Friend, M. and Franson, J. C. (1999-2001) Field Manual of Wildlife Diseases: General Field Procedures and Diseases of Birds. U.S. Department of the Interior, U.S. Geological Survey, Madison, USA.

http://www.nwhc.usgs.gov/publications/field_manual/chapter_38.pdf

Further information

Contact your local office of the Department of Environment and Conservation.

See the Department's website for the latest information:
www.dec.wa.gov.au.

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