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108 – Botulism I

Introduction

Botulism is a 'poisoning' caused by the exotoxins of Clostridium botulinum. This disease has also been known as western duck sickness or limberneck. Most cases of avian botulism are caused by C. botulinum type C and a variety of avian species can be affected. The public health significance of avian botulism is minimal.

History

Botulism was first reported in chickens in 1917 following the ingestion of canned vegetables by chickens. Western duck disease was first seen in the USA in the early 1900s, but only later found to be caused by C. botulinum type C.

Distribution

This disease has affected waterfowl and poultry around the world. Originally thought to be a problem in free range poultry the problem has subsequently been seen in intensively reared poultry.

Aetiology

C. botulinum is a Gram positive, spore forming bacterium that can produce potent exotoxins. Although there are eight toxigenic subgroups, avian botulism is primarily caused by C. botulinum type C. Botulism toxins are amongst the most potent toxins known. Type C toxin is produced under anaerobic conditions and temperatures between 10-47°C.

The disease

In one study of 27 outbreaks of botulism in chickens birds aged from 2-8 weeks of age were affected. Older broilers are relatively resistant to botulism C1 toxin. Morbidity and mortality are high and high levels of toxin induce the disease within hours – with low doses the disease takes a day or two to appear. In chickens a flaccid paralysis progresses from the head to the legs. Initially birds are reluctant to move, if they are encouraged to walk they appear to be lame and their wings droop. Limberneck precisely describes the neck paralysis which is seen. Paralysis of the eyelids makes birds appear to be comatose or dead. Gasping is sometimes seen and death is from cardiac and respiratory failure.

Transmission

C. botulinum type C has a worldwide distribution and is found wherever there are large populations of waterfowl or poultry. The presence of C. botulinum type C in the intestinal tracts of wild and domestic birds and the production of resistant spores favours the spread of this bacterium.