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Transmission

In Newcastle disease infection large quantities of virus are excreted in the faeces and ingestion of infected faecal material is an important means of spread. Viral particles are also present in respiratory aerosols and droplets but many factors influence whether or not these remain infectious.

Vertical transmission may or may not occur. Infected embryos have been associated with maternal infection but usually these die in the egg and so their role in disease transmission is non-existent. However, such eggs, if cracked or broken, may serve as a source of Newcastle disease virus for newly hatched chicks, as will contaminated faeces on the outside of eggs.

Virus may also be able to penetrate the egg shell after having been laid. Infected chicks can hatch from eggs experimentally infected with some of the lentogenic viruses.

Spread of Newcastle disease virus

The following have been implicated as means of virus spread in various outbreaks of Newcastle disease:

- Movement of live bird – feral/migratory birds, pet birds, racing pigeons, game birds and commercial poultry.
- Contact with other animals.
- Movement of people and equipment.
- Movement of poultry products including litter.
- Airborne spread.
- Contaminated poultry feed.
- Contaminated water.
- Vaccines.

Outbreaks of Newcastle disease in northern Europe in the spring of 1997 originated from primary outbreaks associated with the unusual migratory patterns for wild waterfowl. Man spread the virus from these primary outbreaks to create the secondary outbreaks. Strict quarantine in many countries has minimised spread by exotic birds although Newcastle disease virus is frequently found in such birds. The California epizootic of 1971-72 was attributed to infected imported exotic wild birds such as parrots. Backyard fowl (fighting cocks) have been involved in three outbreaks of Newcastle disease in the USA and, although minimal, the spread from backyard to commercial poultry flocks did occur. Airborne spread was important in the 1970-71 outbreaks of Newcastle disease in the UK but not in the 1971-72 outbreak in California, USA. The 1984 outbreaks of Newcastle disease in the UK were caused by feed that had been contaminated by infected pigeons. Vaccination crews moving from farm to farm have been implicated in the spread of Newcastle disease as have the incomplete inactivation of dead vaccines and the contamination of live vaccines.

Incubation period

The incubation period for Newcastle disease following natural exposure to the disease can be anything from 2-15 days but is typically 5-6 days.