

Fowl pox

Fowl pox

Is an infectious worldwide disease of the avian species caused by viruses of the family Poxviridae and the genus Avipoxvirus. The viruses causing fowl pox are distinct from one another but antigenically similar, possible hosts including chickens, turkeys, quail, canaries, pigeons, and many other species of birds that is characterized by proliferative growths on the featherless parts of the body or caseous plaques on the membrane of the mouth.



Fowl Pox

Pox is a common viral disease of commercial poultry (chickens and turkeys) as well as of pet and wild birds. Of the approximately 9000 birds species, about 200 in 23 orders have been reported to have acquired a natural poxvirus infection.

Fowlpox is an economically important disease of commercial poultry because it can cause a drop in egg production and mortality.

There are two forms of the disease.

The first is spread by biting insects (especially mosquitoes) and wound contamination and causes lesions on the comb, wattles, and beak. Birds affected by this form usually recover within a few weeks.

The second form is spread by inhalation of the virus and causes a diphtheritic membrane to form in the mouth, pharynx, larynx, and sometimes the trachea.

Fowlpox is a common disease in backyard chickens that have not been vaccinated.

Most birds survive the infections, although very young or weak birds may be lost. The lesions initially looks like a whitish blister and appear on the comb, wattles and other skin areas. In rare cases lesions can be found on the body, legs and even sometimes the softer parts of the beak. The blisters develop into a dark scab and take about three weeks to heal and drop off.

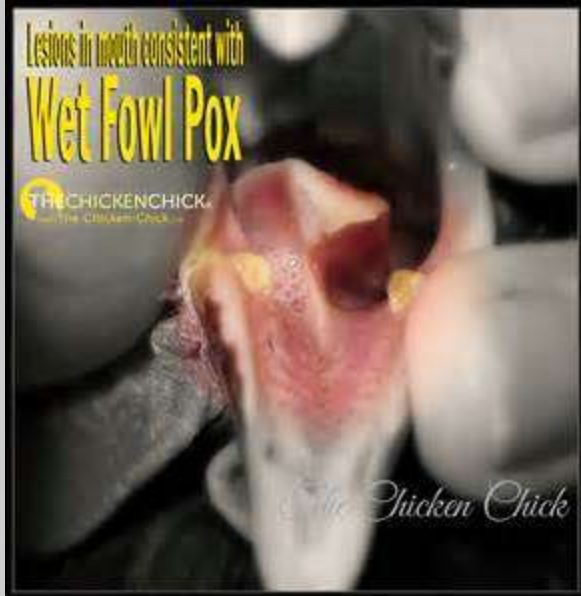
Fowl pox lesions, when in the infected birds mouth and throat can cause difficulty breathing, even death. Scarring may result and consequently exhibition poultry breeders prefer to vaccinate and avoid this disease.

Management of the mosquito population can help reduce outbreaks of fowlpox.

Economic Significance

Mortality in flocks exhibiting the mild cutaneous form of the disease is usually low. However, it may become high with generalized infection, especially when lesions are primarily diphtheritic or when the disease is complicated by other infections or poor environmental conditions.

The systemic form of disease in canaries causes high mortality.



Etiology

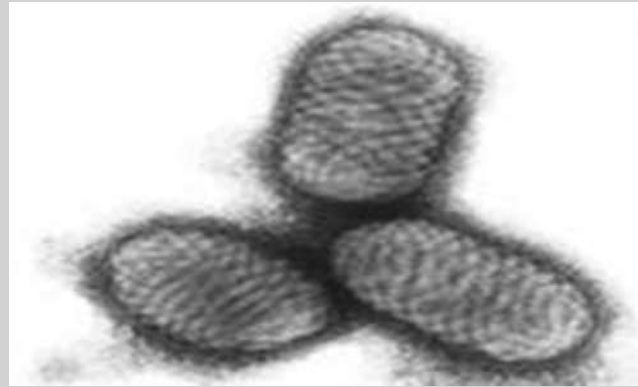
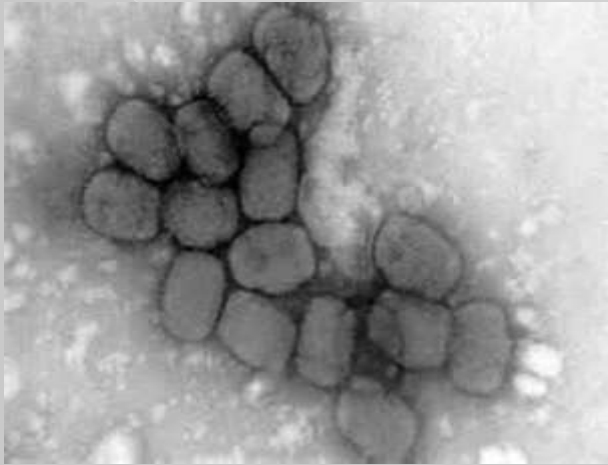
➤ Virus

- ❖ Fowl Pox
- ❖ Turkey Pox
- ❖ Canary Pox
- ❖ Pigeon Pox
- ❖ Quail Pox

are members of the genus *Avipoxvirus* of the family Poxviridae.

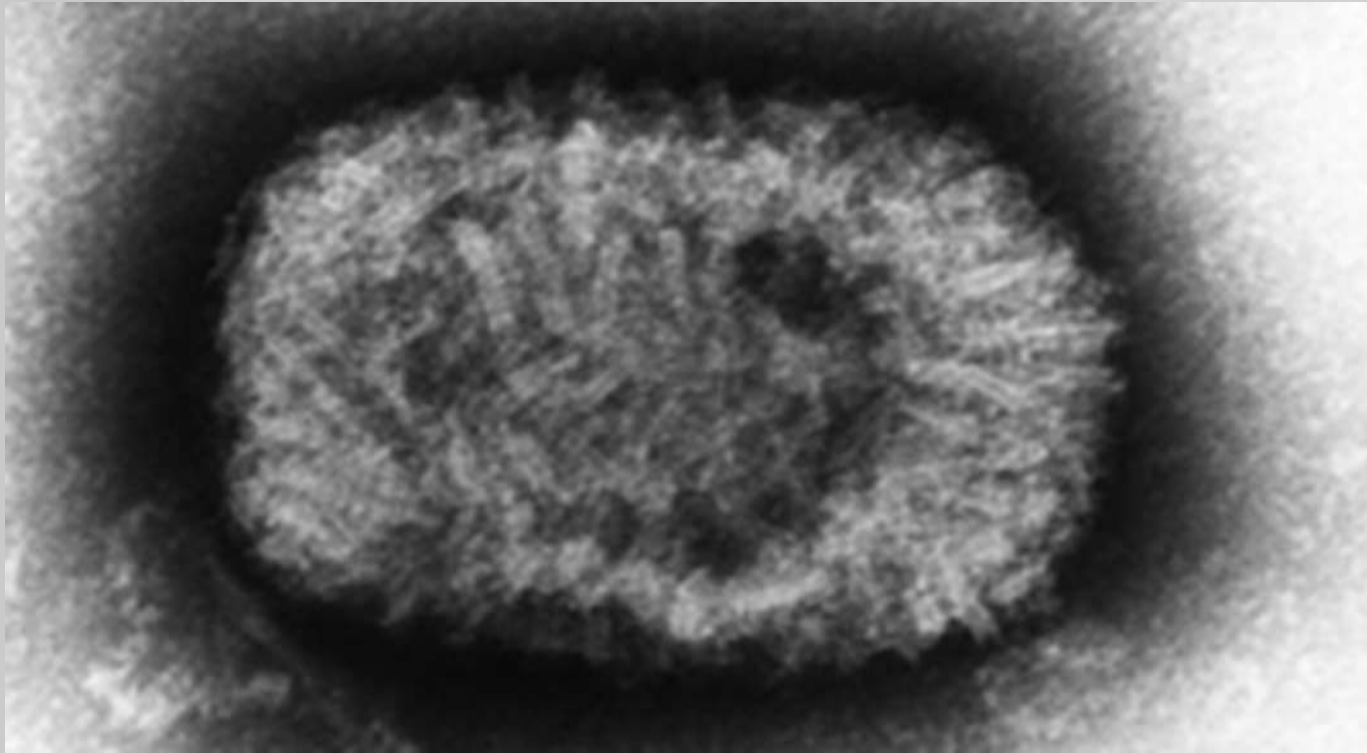
The mature virus (elementary body) **is brick shaped** and measures about **330 280 200** nm.

These viruses are highly resistant to drying. There is some cross species infectivity with the various viruses with the exception of canary pox which is specific for canaries.



Fowl Pox
pox lesions on comb





Incubation Period

6-14 Days

Average 1 week

Course of Disease

3-4 Weeks to run through the whole flock

Mortality

1-2% In most cases

Method of Spread

- Mosquitoes act as mechanical carriers. So this is a seasonal problem; increased incidence in late summer / early fall as day length shortens and nights get cool. Mosquitoes go into lighted chicken houses in evening to take a blood meal.
- Contact with infected birds. A break in the integrity of the epithelium is necessary to produce the infection.
- Wild birds may be a **reservoir** of infection.

Susceptibility to Chemical and Physical Agents

Resistance to ether treatment is listed as one of the taxonomic criterion for poxviruses

- 1- pigeon pox virus and two derived mutants were resistant to both chloroform and ether.
- 2- Most viruses are stable and very resistant to temperature change in dry condition.
- 3- They last for months or years in dust.

Incidence and Distribution

Avian poxviruses infect birds of both sexes and all ages and breeds. The disease has been reported in more than 200 avian species.

Fowlpox, in commercial poultry, is worldwide in distribution . The incidence, however, is variable. In high-density areas where multiple age birds are raised under confined conditions, the disease tends to persist for a long time despite preventive vaccinations.

In recent years, several outbreaks of the diphtheritic form of fowlpox have been encountered in previously vaccinated chicken flocks.



Clinical Signs

The disease may occur in one of the two forms, **cutaneous** or **diphtheritic**, **or both**. In addition, a systemic form of infection with high mortality is usually seen in canaries.

The cutaneous form of the disease is characterized by

1- The appearance of nodular lesions on the comb, wattle, eyelids characterized by small grey papular eruptions on the featherless parts of the body.

2-Cutaneous eye lesions will interfere with the bird's ability to reach food and water.

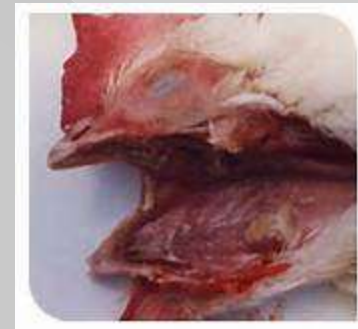


In the diphtheritic form (wet pox)

1- cankers or diphtheritic yellowish lesions occur on the mucous membranes of the mouth, esophagus, or trachea with accompanying Coryza-like mild or severe respiratory signs similar to those caused by infectious laryngotracheitis virus infection of the trachea.

2- Lesions in the corner of the mouth, on the tongue, throat, and upper part of the trachea interfere with eating, drinking, and breathing.

3- In pullets coming into lay and in older birds, the disease often runs a slow course accompanied by unthriftiness and reduced egg production.



Differential Diagnosis

Laryngotracheitis

Trichomoniasis in quail

Gross Lesions

The cutaneous form characterized by :

Local epithelial hyperplasia involving epidermis and underlying feather follicles, with formation of nodules that first appear as small white foci and then rapidly increase in size and become yellow.

In chickens infected intradermally, a few primary lesions appear by the 4 day. Papules are formed by the 5 or 6 day.

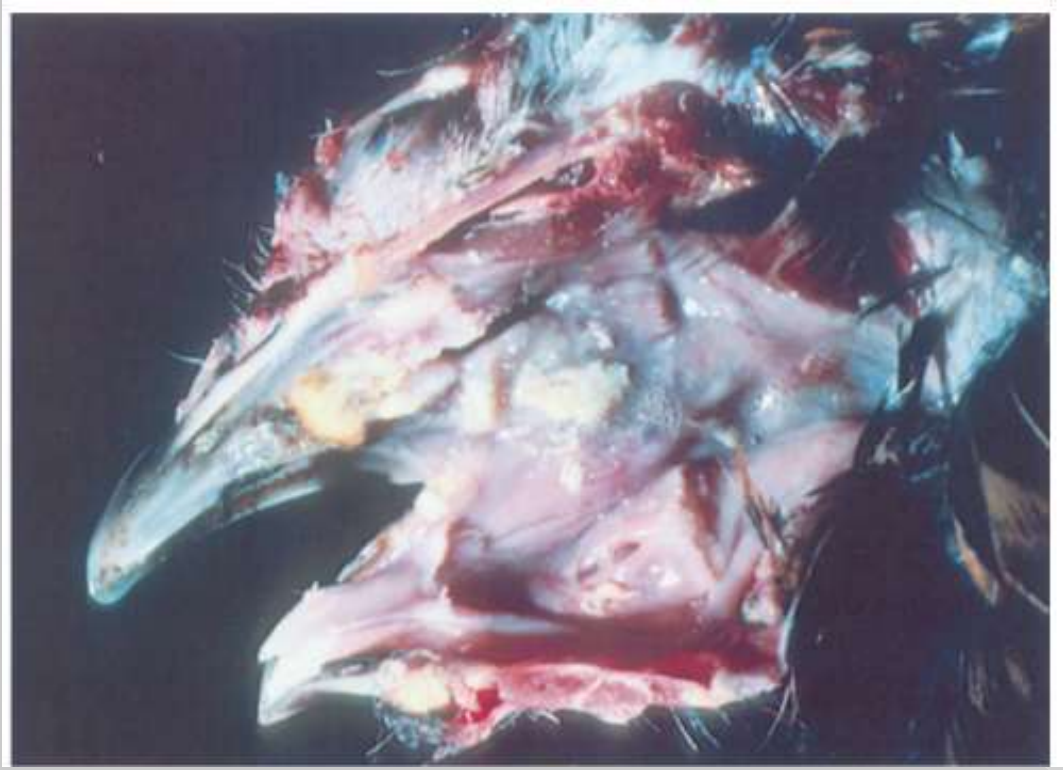
This is followed by the vesicular stage, with formation of extensive thick lesions. After about 2 weeks or sometimes sooner, lesions have areas of inflammation at the base and become hemorrhagic. Formation of a scab, which may last for another 1—2 weeks, ends with desquamation of the degenerated epithelial layer.

Diphtheritic form:

Slightly elevated, white cloudy nodules or yellowish patches develop on the **mucous membranes of mouth, esophagus, tongue, or upper trachea.**

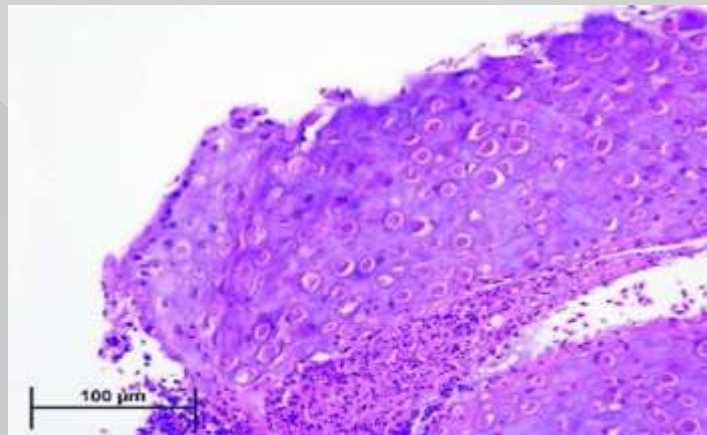
Nodules rapidly increase in size and often combine to become a yellow, cheesy, necrotic, pseudodiphtheritic, or diphtheritic membrane. If the membranes are removed, they leave bleeding erosions.



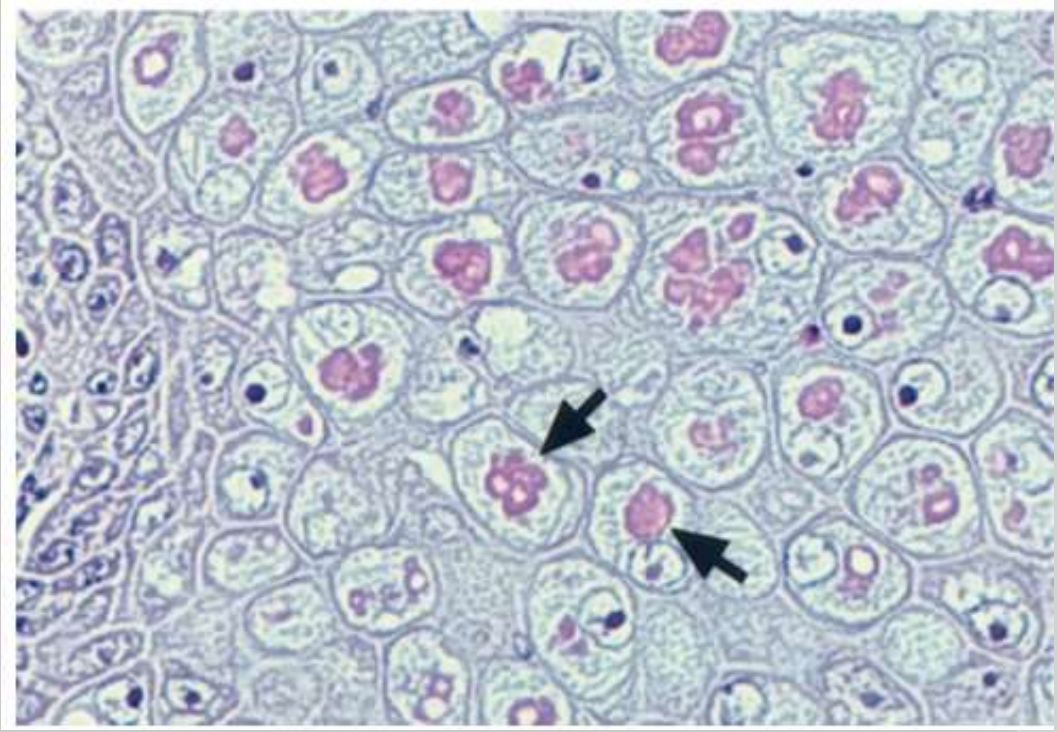


Microscopic.

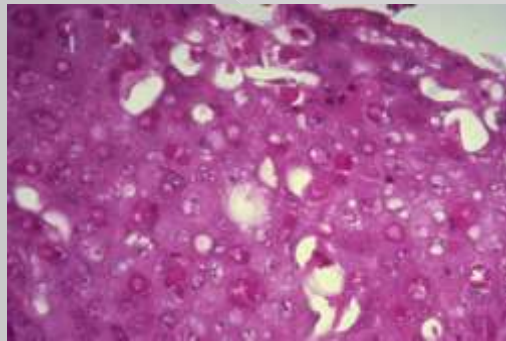
The most important feature of infection is hyperplasia of the epithelium and enlargement of cells, with associated inflammatory changes. Characteristic eosinophilic cytoplasmic inclusion bodies (Bollinger bodies) are observable in infected cells.



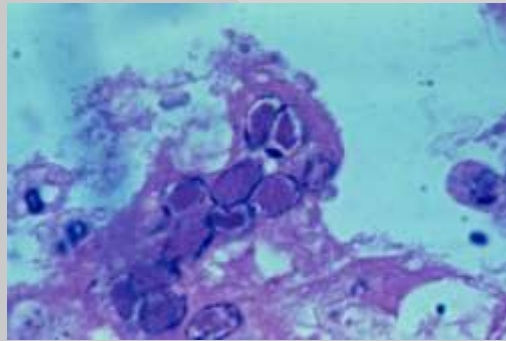
Histopathologic changes of tracheal mucosa include initial hypertrophy and hyperplasia of mucus-producing cells, with subsequent enlargement of epithelial cells that contain eosinophilic cytoplasmic inclusion bodies.

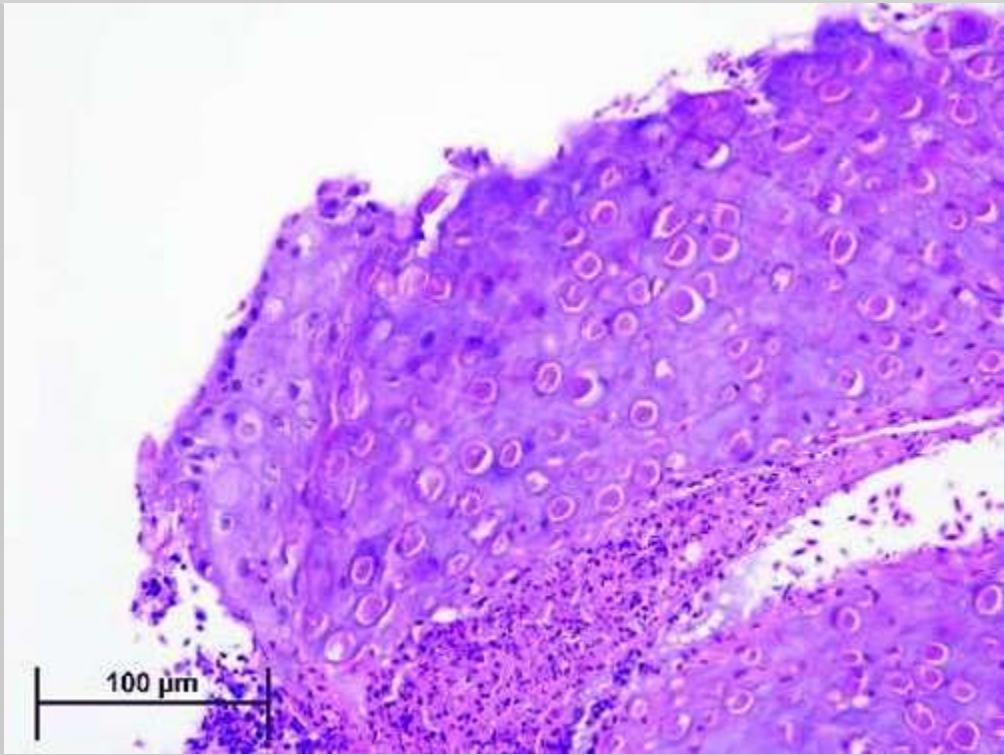


Histo



Intracytoplasmic Inclusion Bodies





➤ **Diagnosis**



- 1-Typical lesions.
- Fowl pox is readily diagnosed on the basis of flock history and presence of typical lesions. In some cases, laboratory diagnosis by tissue or transmission studies is necessary.
- 2-Histopathology – intracytoplasmic inclusions with ballooning degeneration.

➤ 3-Viral isolation on the CAM of embryonated eggs. Pock development on the CAM indicates virus.

➤ 4-PCR can be used to amplify genomic DNA

This procedure is useful when an extremely small amount of viral DNA is present in the sample. PCR has been used effectively to differentiate field and vaccine strains of the virus.



Treatment

There is no treatment for fowl pox.

Removal of scabs around the eyes or mouth will facilitate eating or drinking.

Disease control is accomplished best by preventative vaccination since ordinary management and sanitation practices will not prevent it.

Several kinds of vaccines are available and are effective if used properly.

Vaccination of broilers is not usually required unless the mosquito population is high or infections have occurred previously.

The chicks may be vaccinated as young as one day of age by using the **wing-web method** and using a one needle applicator.

All replacement chickens are vaccinated against fowl pox when the birds are **six to ten weeks of age**.

One application of fowl pox vaccine results in permanent immunity.







Prevention and Treatment

Where fowlpox is prevalent, chickens and turkeys should be vaccinated with a live-embryo or cell-culture-propagated virus vaccine. The most widely used **vaccines are attenuated fowlpox virus and pigeonpox virus isolates of high immunogenicity and low pathogenicity.**

In high-risk areas, vaccination with an attenuated vaccine of cell-culture origin in the **first few weeks of life** and revaccination at **12–16 wk** is often sufficient.

Health of birds, extent of exposure, and type of operation determine the timing of vaccinations. Because the infection spreads slowly, vaccination is often useful in limiting spread in affected flocks if administered when <20% of the birds have lesions.

Passive immunity may interfere with multiplication of vaccine virus; progeny from recently vaccinated or recently infected flocks should be vaccinated only after passive immunity has declined. Vaccinated birds should be examined 1 wk later for swelling and scab formation (“take”) at the site of vaccination.

Naturally infected or vaccinated birds develop humoral as well as cell-mediated immune responses. Humoral immune responses can be measured by ELISA or virus neutralization tests.

Turkeys are also routinely vaccinated. Once a bird is infected there are no treatments, just preventative measures including the vaccine and mosquito management.

Vaccine



Vaccination



Vaccination



Vaccination



Checking Takes



Checking Takes

