

# Eye Disorders of Poultry <sup>1</sup>

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Eye disorders are not generally prevalent in poultry on a flock basis. However, as birds rely heavily on their sense of sight to carry on their daily activities, an increased incidence of eye problems can result in decreased flock performance. A visually impaired bird is at a major disadvantage in competing for food, water, and social position in a population of birds.

## Ammonia Toxicity

The most common eye irritant in intensive animal production systems is ammonia gas (NH<sub>3</sub>). Ammonia gas is extremely irritating to the membranes that line the eyelids, eyes, sinuses and trachea. Conjunctivitis is inflammation of the conjunctiva (membranes that line the eyelids) and the exposed sclera (white part of the eye). Affected birds have reddened, swollen eyelids, and are sensitive to and avoid light. If high ammonia levels persist, the cornea, the outermost part of the front of the eyeball, becomes ulcerated and blindness may occur.

Ammonia gas is a bacterial breakdown product produced when uric acid from poultry manure combines with water forming a suitable environment for bacterial growth. Bacterial growth, and the resulting NH<sub>3</sub> production, is also dependent upon litter or manure pH and temperature.

In intensive production systems, high levels of ammonia gas buildup are associated with inadequate ventilation. Ammonia is not typically a problem for birds raised in extensive or semi-extensive systems.

## Marek's Disease

Marek's disease is a viral disease of chickens resulting in a type of cancer. Tumors developing in nerves cause lameness and paralysis. Tumors can also occur in the iris (segmented membrane behind the cornea perforated by the pupil) and cause irregular shaped pupils and blindness.

Chicks can be vaccinated at the hatchery. While the vaccination is effective in preventing formation of tumors, it does not prevent infection by the virus. Recent studies have shown that conventional Marek's disease vaccines may not prevent formation of tumors in the eye.

## Avian Pox

Avian pox is a viral disease that affects many types of birds. Fowl pox primarily affects chickens and turkeys. Pigeon pox affects pigeons, chickens, turkeys, ducks, and geese. Canary pox infects canaries, chickens, sparrows, and probably other species.

Pox is characterized by raised, blister-like lesions that develop on unfeathered areas (head, legs, vent, etc.) of the bird. If the lesions are around the eyes, then swelling may occur with impairment of eyesight and possibly blindness in severe cases. Ordinarily, the eyeball itself remains unaffected and, once lesions are resolved, eyesight should return to normal.

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## Bacterial Infections

A number of bacterial infections can lead to damage of the eye. Salmonella bacteria, particularly *Salmonella typhimurium* and *Salmonella arizonae*, are known to cause severe purulent conjunctivitis and ophthalmitis (inflammation of the eyeball and conjunctiva with pus) and blindness. Often young birds acquire the infections from the hen or through navel or yolk sac infections.

## Fungal Infections

Molds readily grow on a number of different materials, including poultry feed and litter. A common mold is *Aspergillus*. Birds can be exposed to *Aspergillus* or other fungi in the hatchery, or more commonly in poorly dried litter. While *Aspergillus* is usually considered a respiratory tract pathogen, it can also invade the brain and eye. Yellow plaques develop and can be found under the eyelid. The eye becomes inflamed and severe damage can occur.

## Respiratory Infections

A number of respiratory diseases can cause conjunctivitis, including Newcastle disease, laryngotracheitis, infectious bronchitis, chlamydia, and mycoplasma. These infections do not damage the eye itself, but cause the bird discomfort, leading to rubbing and scratching of the eyelids. Permanent eye injury with these conditions is rare. However, sinusitis can develop, causing swelling of the sinus under the eyelid and adding to bird discomfort.

## Nervous System Disorders

Avian encephalomyelitis virus normally causes disease in chickens 1-6 weeks of age. The virus primarily affects the nervous system. Affected chicks show a dull expression of the eyes, followed by progressive incoordination, sitting on hocks, tremors of the head and neck, and finally paralysis or prostration. In adult birds previously infected as chicks, the virus can cause cataracts and general eye enlargement. The lens of the eye becomes fragmented and can no longer function properly to focus images.

## Nutritional Deficiencies

Certain vitamin deficiencies, such as vitamin A and vitamin E, can result in damage to the eye. Vitamin A is necessary for the production of visual pigment of the retina and for maintenance of the lining of the tear ducts. Vitamin E is necessary for maintenance of the lens protein in the developing embryo. Vitamin E is passed from the breeder hen to the egg. If the breeder is receiving inadequate vitamin E in

the diet, the embryo will suffer from a vitamin E deficiency and possible blindness. Vitamin deficiencies are rare when commercial poultry feeds are used.

## Developmental Disorders

Congenital abnormalities in the formation and placement of the eye and eye socket occur, but the incidence is low. Abnormalities seen include one or both eyes missing, eyes reduced in size or placed forward on the head. These abnormalities may be hereditary or may be due to improper pre-incubation or incubation conditions. Affected chicks are usually culled at the hatchery.

## Cataracts

A high incidence of cataracts can occur in flocks with vitamin E deficiency, avian encephalomyelitis infection, or continuous exposure to some types of artificial lighting.

## Trauma

Injury to the eye and surrounding structures can occur in the hatchery, during transportation to the farm, or on the farm by poorly maintained equipment. Bright, shiny eyes can be an attractive target for picking by flock mates. Most chicks, however, are very adept at protecting their heads so that eye injury due to picking is rarely a problem.