

## Infectious Diseases of Poultry

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### INTRODUCTION

Poultry that have an infection show a variety of symptoms, such as respiratory problems, diarrhoea and paralysis. It should be emphasised at the outset that prevention of infection in a poultry flock through sound management is very important. This is because although some infectious diseases can be treated, for many it is a waste of time and money and infected birds should be disposed of immediately.

Infectious organisms may be divided into four classes: protozoan, bacterial, fungal and viral. Specific drugs are usually recommended for bacterial, protozoan and fungal infections, while some viral diseases can be prevented by vaccination. For more information on suitable drugs, consult your local veterinarian.

The diseases commonly found in poultry in the Northern Territory (NT) are denoted by an asterisk (\*).



### BACTERIAL DISEASES

#### (a) \*Colibacillosis

This is the common name for a large variety of diseases, including yolk-sac infection of chicks, reproductive disorders and peritonitis in layers, and septicaemia (blood poisoning) in growers. They are all caused by the bacterium *Escherichia coli*, which is found in the intestines of all warm-blooded animals.

Affected birds can be treated with antibiotics. To prevent further spread of this organism, disinfect the premises and the pens with a commercial disinfectant, and provide good drainage.

#### (b) \*Salmonella infection (paratyphoid and pullorum)

##### (i) Paratyphoid (*salmonellosis*)

Salmonella infections may affect all domestic poultry, although adult birds often do not show any symptoms. Salmonella bacteria may also contaminate hatching eggs, which results in diarrhoea, depression and death in young chicks. Paratyphoid is highly infectious and can be transmitted by mice, rats, other birds and/or through contaminated feed. Symptomless adult birds constitute a human health risk if meat and egg hygiene are not adequate.

##### (ii) Pullorum (*bacillary white diarrhoea*)

Usually a symptomless disease in adults, pullorum is transmitted to young chicks through the egg. This results in fatal diarrhoea within the first four weeks of life. Adult birds may suffer from infection of the ovaries, or septicaemia. This disease can be eliminated with good hatchery hygiene. No cases have been reported in the NT in recent years. All poultry entering the NT must come from pullorum-free hatcheries. To avoid this disease, buy chicks only from a reputable hatchery.

### **(c) Psittacosis**

Psittacosis is found mainly in psittacine birds (parrots, lorikeets, galahs, cockatoos, budgerigars etc), but may also affect pigeons, turkeys and chickens. In chickens, symptoms may pass unnoticed or the birds may exhibit general weakness, diarrhoea and discharge from the eyes and nose. All infected birds should be culled and burned. The remainder of the flock should be treated with antibiotics in the feed. As the disease can be transmitted to humans, great care must be taken when handling infected birds. In humans, the disease resembles influenza but can progress to a severe, and possibly fatal, pneumonia.

### **(d) Avian spirochaetosis (tick fever)**

In chickens and turkeys the blood parasite *Borrelia anserina* causes a relapsing fever-like condition. This disease, which is transmitted by the fowl tick *Argas persicus*, has been diagnosed in Darwin, Alice Springs and on many stations. Birds of all ages may be infected. They become feverish, have green diarrhoea and may become paralysed in the wings or legs.

The disease can be controlled by eliminating ticks from the flock (see Agnote K2 *External Parasites of Poultry*). In backyard flocks, the painting of perches and woodwork with sump-oil or creosote and removing and disposing of wood and rubbish from yards is usually an effective method of control.

### **(e) \*Staphylococcus infections**

The bacterium *Staphylococcus aureus* is widespread in the environment and causes a variety of opportunistic infections in poultry, especially in the tropics. These include foot abscesses, infections of joint membranes and dermatitis of combs and wattles.

These infections may be treated with suitable antibiotics in the feed. Badly-infected birds are best removed and destroyed, as full recovery does not usually occur. The premises should be disinfected.

### **(f) Infectious coryza**

Infectious coryza is caused by a small bacterium *Haemophilus gallinarum*, which mainly infects growing and laying fowls under conditions of poor hygiene, ventilation and nutrition. Symptoms are discharge from the eyes and nostrils, a swollen face, a drop in egg production and sometimes diarrhoea. It is a chronic disease, which can result in mortalities when complicated with other infectious agents. Infected birds should be culled, as they may remain carriers for several months after infection. Preventative measures include rearing growers away from older birds, culling of carrier birds and improved management.

### **(g) Chronic respiratory disease (CRD)**

CRD is caused by *Mycoplasma gallisepticum*. Its symptoms are sniffing, sneezing and depressed egg production in chickens and sinusitis in turkeys. Its severity often depends on the concurrent presence of other diseases. Both turkeys and fowls of all ages can be infected. This disease is transmitted by inhaling infected air droplets, through eggs to the next generation, or by mechanical means, such as boots and equipment. The organism will die in a day or two when pens are empty, but recovered birds may remain carriers for some time. CRD may be treated with specific antibiotics and vitamin supplements in the feed if only a few birds are involved.

Another bacterium of this group, *Mycoplama synoviae*, causes subclinical upper respiratory tract infection and may be involved in air sacculitis associated with Newcastle disease and infectious bronchitis. Consult your veterinarian for antibiotic recommendations for these diseases. Vaccines are available for both of them.

### **(h) \*Fowl cholera**

All domestic poultry are susceptible to this highly infectious disease, caused by the bacterium *Pasteurella multocida*. Fowl cholera may be deadly, or may linger in infected birds. Symptoms are variable and include respiratory problems and diarrhoea. It is spread through the flock by contaminated water, in droppings and in nasal discharges. All infected birds should be culled and burned. The disease can be treated with a number of antibiotics or sulphonamide drugs. It can be prevented by good management and vaccination.

**(i) \*Tuberculosis (*Mycobacterium avium*)**

Rarely found in young chicks, this infection is a "wasting" disease of all domestic poultry, canaries, parrots, pigeons and wild birds kept in captivity. Avian tuberculosis may be transmitted to humans, cattle and pigs.

Symptoms are not specific and may include gradual loss of weight, diarrhoea, lameness, general weakness and eventually, death.

Treatment is not recommended. All infected birds should be culled and burned. The premises should be cleaned with a phenolic disinfectant or lime and then left for two years before introducing a new flock. Notify the Department of Resources if you suspect tuberculosis in your poultry.

## **FUNGAL DISEASES**

As all domestic poultry, wild birds, other animals and humans can be infected by fungi, take great care when handling infected birds. Transmission occurs by inhaling fungal spores from sick birds, contaminated litter or feed.

**(a) \*Aspergillosis**

The most common fungal disease in birds is *Aspergillus fumigatus*, which causes pneumonia or enteritis in all age groups, especially in the presence of other infections.

Treatment is not recommended. Infected birds should be culled and burned. All mouldy litter should be removed and burned and the pens should be sprayed with 1% copper sulphate.

**(b) \*Candidiasis or thrush**

Candidiasis is another common fungal disease, which is found in younger age groups of all domestic poultry. It usually affects the mouth and crop, with sour-smelling crop content. It may also cause diarrhoea. It primarily affects stressed birds. Check for unsanitary conditions, overcrowding and coccidiosis. Treat with nystatin to provide effective control.

## **PROTOZOAN DISEASES**

**(a) \*Coccidiosis**

Coccidiosis is one of the most common diseases of poultry. It is caused by a number of species of protozoa called coccidia. Fowls, turkeys, ducks and geese are all affected. However, coccidia are host-specific, so fowls are not affected by duck coccidia and vice versa.

The disease usually affects birds over three weeks of age. The symptoms include ruffled feathers, drooping wings, pale combs and diarrhoea, sometimes streaked with blood. Most losses occur in young birds, but adult birds can also be affected. Large numbers of chickens may die suddenly without apparent symptoms.

The coccidia live in the intestine or caecum of the bird and pass out through the droppings. They become infective in damp surroundings and are spread from bird to bird when infected droppings are eaten. Coccidia may survive for long periods in the litter.

Good management will help prevent serious outbreaks of coccidiosis. If birds are denied access to droppings, the life cycle will be broken. This is achieved when birds are raised on wire. Damp litter around water troughs will allow coccidia to become infective.

Medication in feed is often necessary to prevent outbreaks of coccidiosis. Young birds raised on the ground should be routinely treated with a coccidiostat. As the wet season provides ideal conditions for coccidia to become infective, medication is recommended at that time.

### **(b) \*Blackhead**

The protozoon that causes this disease is *Histomonas meleagridis*. Both young fowls and turkeys are affected by this protozoon but turkeys are far more susceptible and are more likely to contract this disease when run with poultry than when run on their own. Histomonads live largely in the caecum (blind gut) and invade other organs from there. Symptoms of blackhead include a drooped and huddled appearance, dark colouration of the head, shrunken comb and wattles and yellowish diarrhoea.

Living in the caecum places the histomonads in contact with the caecal worm (*Heterakis gallinae*) and the eggs of the worm become infected with the protozoa. Blackhead is transmitted when birds eat droppings containing these infected worm eggs.

Drugs are available to treat blackhead. To prevent re-infection, control caecal worms at the same time with good management. Turkeys and fowls should not be run together.

### **(c) Trichomoniasis**

Trichomoniasis is caused by *Trichomonas gallinae*. It is a disease of the upper digestive tract. It has been found in pigeons, doves and kites in the NT but may invade hens and turkeys if they drink infected water or eat infected feed. Affected pigeons will go off-feed, appear ruffled, become emaciated and die, with a green yellow fluid dripping from the beak.

## **VIRAL DISEASES**

Viral diseases are the most common cause of losses, not only in large commercial flocks, but also in backyard chickens. Mostly, they do not respond to drug therapy. Treatment relies on supportive measures. Prevention and control relies on vaccination where this is effective, or by limiting exposure to infected birds. If a secondary bacterial infection is also present, antibiotics may reduce the severity of an outbreak.

### **(a) \*Marek's disease (MD)**

This disease usually affects birds two to five months old and causes lymphoid tumours. Symptoms vary according to the position of the tumours. Usually the nerves are affected and spastic paralysis occurs either in the legs, wings or neck. The virus of MD can remain infective for many months in litter or dry feathers. MD is prevented very effectively by vaccinating day-old chicks. Buy only vaccinated chicks.

### **(b) Lymphoid leucosis**

This disease is normally found in chickens more than four months old. They pick it up in the first few weeks of their life, or from the mother which, if affected, passes leucosis through the egg. The tumours develop slowly; birds become sickly, pale and thin, and often have an enlarged abdomen.

There is no known effective treatment for leucosis, nor are there any vaccines available. Affected birds should be culled from the flock.

### **(c) \*Fowl pox**

This is a highly infectious disease caused by various host-specific strains of the pox virus. Many birds are affected by these viruses to some extent. The virus can be transmitted directly by infected birds, or be carried by mosquitoes, or other blood sucking insects. By eliminating breeding areas for these insects, the rate of spread of the virus will decrease.

The fowl pox virus attacks the skin and the surface of the mouth and throat. Depending on its location, pox is referred to as either skin pox or wet pox. Skin pox forms wart-like sores, which eventually enlarge and form masses of yellow, dirty crusts. In about a week, these scabs darken and fall off. Wet pox forms cheesy masses in the mouth, nose and throat, which interfere with eating and drinking.

Antibiotics may be administered to prevent bacterial infections but the best method of control and prevention is by vaccination of day-old chicks.

This virus is capable of surviving for a long time in infected material, such as scabs and litter. Such material should therefore be incinerated.

**(d) \*Infectious bronchitis (IB)**

IB is an acute, highly infectious disease of poultry, which may kill young chicks and lower egg production in adult birds. Birds sneeze and have a moist cough. The entire flock will be affected. Laying birds will stop laying and it may take a very long time for them to return to production. There is no effective treatment for this disease. Maintenance of a correct, even temperature in the brooder and a high quality diet will help to minimise losses. Commercial flocks are routinely vaccinated.

**(e) \*Infectious laryngotracheitis (ILT)**

ILT is a disease of all ages of poultry, although usually it is seen in adult birds. An acute form may attack 100% of a flock and cause severe mortality. In the acute form, affected birds exhibit a nasal discharge, gurgling breath sounds, gasping and coughing up of blood-stained mucus. In the mild form, birds are unthrifty, lay poorly and have watery eyes and a persistent nasal discharge. There is no effective treatment but vaccination of unaffected birds may limit an outbreak. Vaccination is effective in preventing the appearance of the disease.

**(f) Reticuloendotheliosis (RE)**

RE became an important disease of commercial flocks in 1976 and, occasionally, still appears in an epidemic form. It causes runting, increased susceptibility to other diseases and feathering defects in growing chicks. In adult birds, it causes lymphoid tumours. No treatment or vaccination is available.

**(g) Avian encephalomyelitis (AE)**

AE is a disease of poultry, turkeys, pheasants and quail, which affects only chicks from hatching to about two months of age. The symptoms are dullness, tremors of the head, staggering, paralysis and prostration. Adult birds show no symptoms other than a decline in egg production, but they carry the virus and pass it on through the egg. The disease may also spread from chick to chick and up to 60% of birds may be affected. There is no treatment for AE but vaccination will prevent it.

## **EXOTIC DISEASES**

Exotic diseases are those which are present elsewhere in the world but not in Australia. There are three which particularly threaten the Australian poultry industry.

**(a) Newcastle disease**

This virus is found in Australia in a mild form only. The dangerous form is widespread throughout the rest of the world. If it became established in Australia, the cost to the poultry industry could be enormous.

Newcastle disease is a highly contagious, lethal disease of chickens and turkeys, although nearly all avian species are susceptible. It may also cause conjunctivitis in humans. In poultry, it may take the form of haemorrhagic enteritis and paralysis, or an acute respiratory disease.

**(b) Avian influenza or bird flu**

It is potentially a fatal disease affecting several bird species and humans. Its symptoms range from mild upper respiratory disease to an acute, generalised, fatal condition. The virus may remain infective in droppings and water for at least a month.

For further information on bird flu consult Agnote K53, *Bird Flu: What Bird Keepers Should Know and Do*.

### **(c) Infectious bursal disease (IBD)**

The virus of IBD is present in Australia but the strain is of low virulence. The hyper-virulent strain has been found in Europe, the USA, Japan and South-East Asia. This strain is very infectious and causes up to 60% mortality in young laying birds. Affected birds peck at their own vent and later exhibit white, watery diarrhoea, depression, trembling and prostration. Less severe outbreaks may show few symptoms apart from low production. The virus may remain infective for over a month in buildings, water, feed and droppings.

### **Entry of exotic diseases**

Migratory birds may be a threat as carriers of Newcastle disease and avian influenza from Asian countries. Live birds or bird products smuggled into the country may carry exotic diseases and threaten the poultry industry. However, Australian regulations are stringent and, so far, effective. Although these diseases may be controlled by vaccination to a certain extent, this will not be attempted if they appear in Australia. They will be eradicated by the slaughter and quarantine of infected and in-contact flocks.

## **TREATMENT OF BIRDS**

**If a number of birds are sick or dead, it is wise to seek veterinary advice before undertaking treatment.**

When treatment of a disease with drugs is needed, the manufacturer's instructions should be carefully followed. If the drug is to be mixed with drinking water or feed, make sure that the birds have no water or feed for a few hours prior to treatment to ensure that all birds drink or eat enough to get an adequate dose.

## **WITHHOLDING PERIOD**

All drugs, including antibiotics and chemicals which are used for the treatment of birds and their yards and sheds, have the potential to form residues in eggs and/or in meat of treated birds. The residues may persist for some time in the birds and necessitate a withholding period before their meat or eggs are free of residue and safe for human consumption. Withholding periods vary. Directions on the container will indicate the necessary withholding period after treatment. Birds should not be killed for consumption during this period and any eggs laid during the period should be discarded. A withholding period also applies to medicinal feed additives.

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