

Webinar 8 Notes

Mareks Disease in Backyard Flocks

The Mareks disease virus was the first virus found to be associated with neoplasia. The virus is a herpes virus

The virus starts off being shed from the feather follicles from infected birds. Then the virus is inhaled by other birds in the flock (only birds up to three months of age can be infected by the virus) and undergoes an initial round of replication in the pneumocytes of the bird (*note: no clinical signs are associated with this initial round of replication*). The virus then enters the blood stream and infects the T-cells .

The initial infection of the T-cells leads to immunosuppression. This tends to make the affected birds more susceptible to other infections such as diarrhoea and respiratory disease which tend to respond poorly to treatment. Often infected birds tend to show poor growth.

Eventually the infected T-cells become neoplastic leading to the formation of tumours, usually between 3 and 6 months. These tumours can be found in the viscera (liver, spleen, kidneys and the reproductive tract) causing reduced growth, increased numbers of birds dying, and diarrhoea. This is called the 'acute form'.

More well known is the fact that tumours can form in the nervous system leading to paralysis and abnormal head and neck movements (this is called 'classical Mareks'). The well known image is one of a bird with one leg forward and one leg back.

Diagnosis can be based upon clinical signs and *post mortem* lesions i.e. visceral tumours of thickening of the sciatic nerve. Confirmation is best carried out using histopathology of liver, spleen and sciatic nerve tissue. It is also worth taking some bursal tissue to differentiate Mareks disease from Lymphoid Leukosis (Leukosis always infects the bursa whilst Mareks disease never does).

PCR testing of feathers from suspected cases can be carried out on live birds at the Institute for Animal Health at Compton in Oxfordshire though this could be expensive!

There is no cure for Mareks and euthanasia is necessary. Not all exposed birds will develop the disease so don't PTS birds without clinical signs.

The key to preventing Mareks is to eliminate the virus so that young chicks are not exposed to the virus or at least they are exposed to as little virus as possible. The most common source of infection is older infected birds or dust containing the dander from infected birds. *Note this dust can get into hard to reach parts of the shed, where owners often fail to clean and disinfect properly.*

There are three components to Mareks prevention:

1. Reduce/eliminate exposure to the virus. Ideally keep young chicks up to three months of age as far away from older birds as possible. Always use an approved disinfectant such as Interkokask to disinfect the coops paying particular attention to hard to reach areas such as air inlets/outlets.
2. Reduce stress on young chicks - there is research showing that stressed chicks are more vulnerable to infection than content stress-free birds
3. Vaccination – the vaccine must be done on the day of hatching, not a few days after hatching! Many owners like to hatch chicks over several days and try to wait until the last birds have hatched to vaccinate the batch. This will not protect the first birds to hatch and often leads to vaccination failures. Chicken Vet currently uses the Poulvac Marek CVI vaccine. This vaccine comes in 1,000 bird vials and costs around £9 per 1000 dose vial. It should be reconstituted

before use and used immediately. Each chick should be given 0.2ml I.M. in the thigh or S.C. in the neck. Either an insulin needle and syringe can be used or a 23 gauge needle.

Avian Leukosis

Whilst we are all very familiar with Mareks disease causing tumours in chicken flocks, Avian Leukosis is another tumour causing virus that can have equally devastating effects.

Avian leukosis virus is a retrovirus. Like all retroviruses the virus transmitted via mating, vertically and through biting insects (such as red mites and biting flies).

Like Mareks disease Avian Leukosis infects the white blood cells (B-Cells in Leukosis and T-Cells in Mareks) which causes two problems: initially immunosuppression then tumour formation (these tumours can form in the: liver, spleen, kidneys, reproductive organs and bones).

Initially the birds may appear to have a minor respiratory infection or diarrhoea; however even with treatment the birds often fail to improve. The affected birds often become dull and lose a lot of weight. Eventually if not euthanized these birds die. In some cases Avian Leukosis causes bone tumours to form in the legs leading to thickened bowed legs.

However it is important to note that unlike Mareks disease Avian Leukosis never causes nervous signs as the virus **never** causes tumours in the nervous system.

The best way to diagnose leukosis is through a *post mortem*. Often it is difficult to distinguish between Mareks and Avian Leukosis on *post mortem* without histopathology.

There is no treatment for Leukosis and the affected birds are best euthanized.

Prevention is based upon keeping a closed flock and only buying birds (and eggs for that matter) from reputable suppliers.

In an outbreak it is important to destroy all red mites and biting flies as these can carry the virus between birds.

One other problem with this virus is that infected birds often act as a reservoir for other diseases such as respiratory disease which can go on to infect birds which do not have Avian Leukosis.

Fowl Pox

Fowl pox is caused by a pox virus and can affect chickens, pigeons and turkeys. The virus is spread in the air from the scabs from infected birds and via biting insects such as red mite.

The virus causes 'pocks' (scab-like crusted raised areas) on featherless skin such as the legs, comb, eye lids and wattles. This is called the 'dry form' of fowl pox. Signs of the 'dry form' are raised crusted areas on the featherless areas of the bird, causing some mild irritation. These birds may stop laying and lose weight. In severe cases if the eye lids are effected the birds can lose sight. Birds with the 'dry form' rarely die.

Much more rarely the virus can infect the mouth, the oesophagus and the trachea initially to form white nodules in these areas but subsequently these areas join together to create a layer of mucus, pus and dead cells from the mouth lining. This is called the 'wet form'. This mucus/pus/dead cells can obstruct the trachea making it difficult for the birds to breathe (in severe cases choking the bird) and it can be very painful making it hard for the bird to eat. Birds with the 'wet form' if severe enough can die.

The virus will spread very slowly throughout the flock but an outbreak will last several weeks.

There is no specific treatment but in the 'wet form' it is worth considering antibiotics.

To prevent fowl pox there is no currently licensed vaccine in the UK but some vets are using the pigeon pox vaccine which only lasts 6 months. It is given by scarification on the wing web.

Improving overall hygiene and keeping the birds as stress free as possible will help.

Note: the fowl pox virus is very resistant and can survive for years on the holding.

Gumboro Disease in Backyard Birds

One of the 22 vaccines that appear in the Chicken Vet presentation's slide on the ex-bat hen in rear is Gumboro disease vaccination. However, as we proceed through the day it is one disease we don't really talk about in any further detail.

Gumboro disease (AKA Infectious Bursal Disease) is named after the town in the USA where it was first discovered. It is caused by a Birnavirus which attacks the Bursa of Fabricius in sexually immature birds. *(Note: after approximately 4 months the bursa will have atrophied and the birds will be refractory to the disease).*

Infection occurs throughout the faeco-oral route. Once in the body, the virus makes its way to the bursa. Here it causes inflammation, oedema and enlargement of the bursa in the early stages leading to petechiation. As the condition progresses, the bursa atrophies and can occasionally contain pus. Naturally, as with any disease attacking the lymphoid system, Gumboro disease causes immunosuppression.

In totally naive birds with no MDA, infection totally overwhelms them leading to a severe diarrhoea, vent pecking (due to bursal irritation), dullness, huddling behaviour and even sudden death. If such birds survive, or in birds that hatch with low levels of MDA, they tend to show poor growth and are susceptible to other conditions. The disease is highly contagious and will rapidly spread throughout a young flock.

Most backyard flocks will have been exposed to the virus leading to good levels of MDA being passed through to their chicks. These chicks are often exposed early on to the virus, building up their own antibodies.

If you want to confirm a diagnosis of IBD then histopathology of the bursae is the best method though this should not be done in birds much older than 2 months of age since the bursae naturally atrophies at such time and can lead to false positive results. Serology can confirm exposure though not the disease itself per se.

When treating affected chicks, maintaining hydration and supplying extra warmth is vital.

Antimicrobials may be used to control any secondary pathogens trying to take advantage of an already compromised immune system.

When dealing with a problem, holding vaccination of the parents is key. Two killed vaccines 4 weeks apart with an annual booster will offer good levels of MDA to their progeny. This should be supported by a live vaccine given to the chicks in **distilled** water at 28 days.

The virus is very hard to destroy with disinfectants and good cleaning and disinfection of problem holdings is necessary.