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Reovirus (REO)

Are you noticing an increasing trend of problems with mobility and lameness in your flock as the birds grow? There are a number of potential causes for lameness in a growing flock and with this article we will explain viral arthritis and reovirus.

What are Viral Arthritis and Reovirus?

Viral arthritis describes inflammation in a joint(s) due to a viral infection. This type of arthritis or joint infection in poultry is relatively uncommon compared with more common causes of arthritis such as bacterial infection – often referred to as septic arthritis. Reovirus is the viral agent which is responsible for causing viral arthritis. Interestingly all poultry flocks are infected with a wide variety of avian reoviruses most of which do not result in viral arthritis or any other disease. This can make diagnosing a case of reovirus viral arthritis quite challenging and often many diagnostic steps have to be taken to rule out other possible causes and successfully confirm reovirus arthritis.

What does viral arthritis look like?

Viral arthritis is a condition that will principally affect broilers (meat type birds) and result in swelling of the leg joints and lower portions of the bird leg (figure 1). An affected flock will appear to contain a number of lame birds. In cases that are quite severe, viral damage to the tendons of the joint can result in tendon rupture which is associated with hemorrhage (figure 2). Over time the joints in birds affected by tendon rupture may start to appear green in color. This is the result of degradation of blood that has pooled in the tissues surrounding the joint. In some cases the first sign that a flock could be affected by viral arthritis is increased carcass downgrades at the processing plant due to the appearance of “green hocks”. It is also important to know that viral damage and hemorrhage in this location greatly increases the risk of secondary joint infections often due to bacterial species such as *E. coli* or *Staphylococcus aureus*.

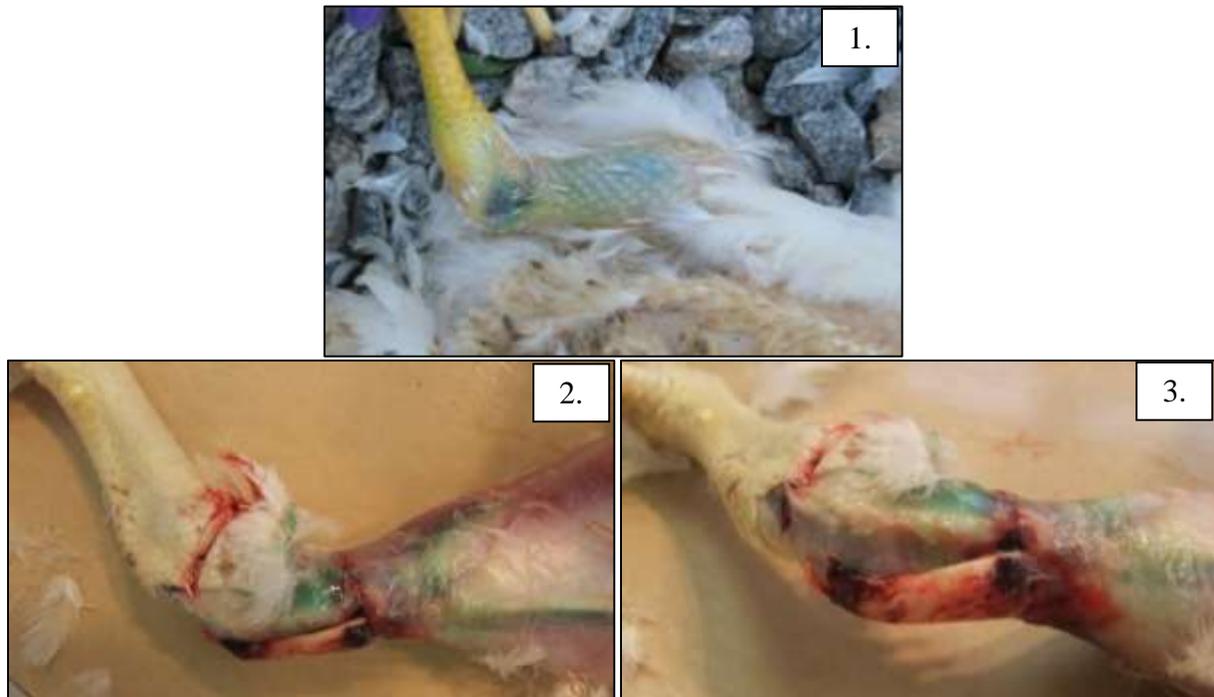
Figure 1:



1. Normal view of hock joint and tendon (from the back), feathered skin removed
2. Dissected view of normal tendon at hock joint

Picture courtesy of PHS

Figure 2:



1. External appearance of a hock joint with a ruptured tendon
2-3. Different views of hock joint and ruptured tendon, with feathered skin removed
Picture courtesy of PHS

How do you diagnose viral arthritis?

As previously mentioned a diagnosis of reovirus infection causing viral arthritis can be challenging. As all poultry flocks will be infected with reoviruses it is not difficult to obtain a reovirus 'positive' test result. However, one positive result does not mean that the flock is affected with viral arthritis. Confirmation of reovirus infection causing viral arthritis requires additional diagnostic steps and further testing which may take some time. Initially if a flock presents with lameness preliminary examination of affected birds should occur. Based on the findings of post mortem examination if viral arthritis is suspected or there is a desire to rule this condition out samples of tendon and joint should be collected. A portion of these samples will likely be tested to determine if there is any bacterial infection present. Some will also be examined microscopically to look for indicators of viral infection. Discovery of microscopic changes that suggest viral infection often prompt further testing and work up. Blood samples may be requested to evaluate if the bird has been exposed to reoviruses and determine what the extent of this response is (generally increased if reovirus is causing viral arthritis). Finally, samples of tendons are also collected to look for reovirus at this specific location using a variety of diagnostic methods such as PCR and virus isolation. If reovirus is isolated from the joint or tendon and other tests are negative for alternative causes of lameness then the diagnosis is of reovirus viral arthritis. Isolation of reovirus from any other sample is considered meaningless due to the common presence of this virus on poultry farms.

If virus is isolated from tendon the next step is to try and characterize the virus – to determine if it is significantly different from vaccine strains of virus. The reason that this extra step is taken is because typically clinical signs due to reovirus infection, including viral arthritis, are protected against through the application of reovirus vaccines. If the reovirus isolated is different from vaccine strains a new

autogenous vaccine may be required to extend the protection of vaccination against the novel reovirus. This situation is, however, exceedingly rare.

How is Viral arthritis prevented?

Keeping a flock free from reovirus infection is impossible. Keeping a flock free from clinical signs of reovirus infection, however, is achieved through the use of live and killed vaccination primarily applied at the broiler breeder level. Maternal antibodies from the hen provide the chick with protection against the virus and clinical signs that could result from infection. Vaccination at the broiler chick level has largely been unsuccessful. This is likely related to the immature immune system in the young bird. It is better to have broiler chicks arrive on farm with protection from the parent hen than to try to stimulate them to develop their own protection using an immune system that is not fully up and running. As mentioned above it is important to be vigilant in the event that a novel virus arises as current vaccines would not necessarily stimulate the perfect maternal antibody protection required in that case.



This article was written by the veterinarians of Poultry Health Services Ltd. Poultry Health Services is a private veterinary practice providing diagnostics for Alberta poultry producers as members of the Poultry Health Centre of Excellence (PHCE). Bird submissions can be submitted to the PHCE via Government offices in Edmonton, Airdrie and Lethbridge. Please call 403-948-8577 if you have a mortality problem or want help making a submission.

References/Further reading

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