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Hemorrhagic Enteritis Virus (HEV)

As a turkey producer you have probably heard about Hemorrhagic Enteritis Virus (HE or HEV) and you may even vaccinate your flock against this disease. It is not likely, however, that you have ever experienced a clinical HE outbreak. That is mainly because presentations of HE infections today are those of secondary immune suppression, due to a more silent initial infection, which damages the immune system. In this article we hope to explain what HE is, how it commonly affects flocks today, and some of the strategies involved in preventing immune suppression in flocks due to HE.

What is Hemorrhagic Enteritis Virus?

Hemorrhagic enteritis virus is a viral disease of turkeys that usually affects birds that are 4 weeks of age or older. Historically this disease caused depression in a flock followed by bloody droppings and death. Examination of birds that had died would typically reveal that the intestine was ballooned and the upper intestinal tract (duodenum) was often most severely affected and blood filled (figure 1). The spleens in these birds would also often be enlarged and mottled/marbled in appearance (figure 2).

Figure 1:



1. Normal duodenal section of turkey intestine
 2. Duodenal (left part of picture) and midgut sections of intestine from turkey affected with clinical HE
- Picture courtesy of PHS

Figure 2:

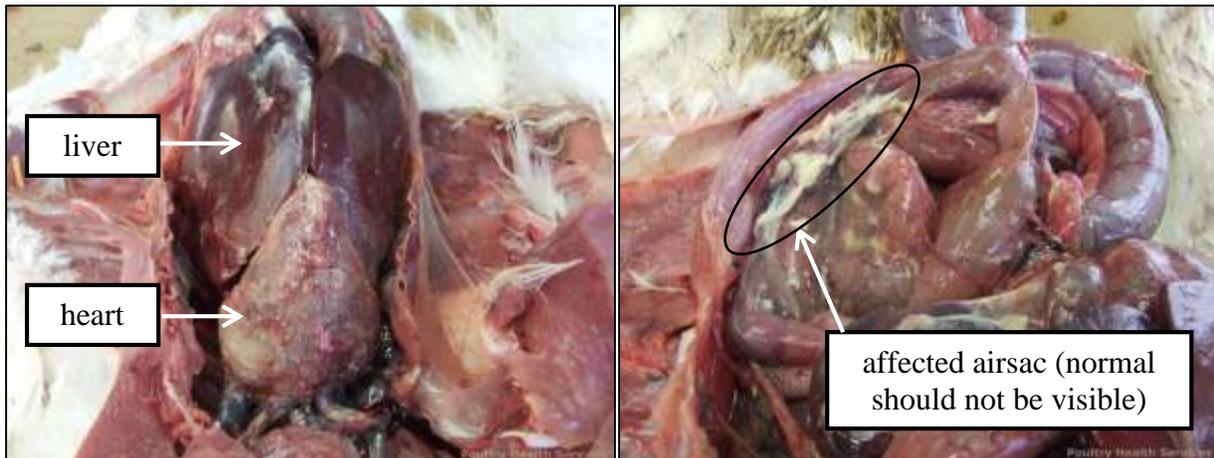


Affected spleen on left, normal spleen on right

Picture courtesy of PHS

The much more common presentation of a flock infected with HE today is that of immune suppression and secondary infections - initial infection of a flock with this virus does not tend to result in immediately obvious symptoms. The virus invades and affects or destroys cells of the immune system reducing the ability of the turkey to fight off infection by other pathogens (bacteria, viruses, parasites, fungi, etc.) that are in the environment. The most common secondary infection that turkeys will develop is bacterial due to *E. coli* (figure 3). If the incidence of *E. coli* related infections on your farm has increased it is wise to investigate for potential underlying causes or risk factors. It is also important to realize that many factors can increase the risk that a flock will develop *E. coli* infection and HE infection is just one of them.

Figure 3:



Bacterial septicemia; affected heart and liver on left, affected airsacs on right

Picture courtesy of PHS

What causes it?

As the name implies, HE (or HEV) is caused by a virus, referred to as a siadenovirus. Disease due to viral infections generally means that there is no effective treatment available (antibiotics do not work against viruses) and the focus must be on prevention. Biosecurity plays a key role in prevention and also in terms of reducing potential secondary challenges.

How is HE diagnosed?

The diagnosis of HE infection in a flock that has not been vaccinated against HE is relatively simple. If no vaccine has been applied then there should be no response when blood is sampled to examine for an immune response to HE. However, if blood tests (serology) indicate that there is an immune response directed against HE this is evidence of exposure to the virus. When taken together with clinical signs of immune suppression in the flock and/or the isolation of the virus this information is diagnostic.

Diagnosis in a vaccinated flock is more challenging. Flocks that are vaccinated will show an immune response to HE when blood samples are tested. The degree of this response can be useful in raising suspicion of additional challenge due to HE field virus (non-vaccine strain virus) but does not prove this. Additionally, as the available vaccines contain live virus isolation of virus would not confirm a field infection. Often an approach that combines several testing methodologies, in addition to history on the farm and ruling out other potential contributing diseases or factors, will play a key role in making the diagnosis of HE infection in a vaccinated flock.

How is HE prevented?

Vaccination is one strategy that can be used to attempt to prevent clinical signs (disease) due to HE infection. It is important to understand, however, that vaccination against this virus relies on administration of a live mild strain of the virus itself. Therefore, in situations where vaccination is used HE infection is not being prevented but rather a mild infection is given in order to stimulate the immune system so that it is prepared to react to field HE infection and shut down field viral replication before clinical signs occur. True prevention of HE infection relies on starting turkey flocks off on a farm that is HE negative, maintaining strict biosecurity to prevent the introduction of HE virus, and routinely monitoring to ensure that subsequent flocks remain negative for evidence of HE exposure. Once HE virus is introduced on a farm it is fairly impractical if not impossible to implement all the steps (down time, cleaning, disinfection, etc.) that would be necessary to successfully remove viral challenge from the farm. Thus, in these circumstances reliance of vaccination as a tool becomes quite important. In situations where single vaccination alone is not proving successful the vaccination program must often be modified potentially including the use of two vaccinations instead. Regular review of vaccine storage and application are also critical as it is possible to damage or destroy vaccine. For further information on application of this vaccine please refer to the references listed at the end of this document.



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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Info Sheet - Water Vaccination: Getting it right the first time, every time.
<http://www.hybridturkeys.com/Hybrid%20Resources/InfoSheets.aspx>