

AVIAN INFLUENZA

AAAP Slide Study Set # 31

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Etiology

- Avian influenza (AI) is an infectious, viral disease of birds caused by several subtypes of the type A strain of the influenza virus. The virus occurs naturally among waterfowl and shorebirds which remain asymptomatic but may transmit the virus to domestic poultry such as chickens, turkeys, and ducks.
- Avian influenza presents itself in two distinct pathotypes, low pathogenic avian influenza (LPAI) and highly pathogenic avian influenza (HPAI). Most AI strains are LPAI and typically cause few clinical signs in infected birds. Some H5 and H7 LPAI strains are capable of mutating under field conditions into HPAI viruses. HPAI is highly infectious and deadly amongst domestic poultry. In recent epidemics of HPAI H5N1, the mutated virus infected and killed waterfowl, shorebirds, and human beings.

Classification

- **AI viruses are classified in two ways:**
 - The first is by their antigenic makeup, which determines how the host's immune system responds. Influenza viruses have two important surface antigens, hemagglutinin (H) and neuraminidase (N). The name of the subtype of influenza reflects the combination of surface antigens; there are 16 H antigens and 9 N antigens. Cross-protection does not occur between subtypes.
 - The other classification is by the severity of the disease they cause in domestic poultry (low pathogenic AI or LPAI and highly pathogenic AI or HPAI as discussed previously).

Natural Distribution

- All known subtypes of influenza A viruses circulate among wild birds, especially migratory waterfowl (such as ducks and geese) which are considered natural reservoirs for influenza A viruses.
- Domestic poultry like chickens and turkeys are not natural reservoirs for AI virus and usually develop clinical disease when infected with AI virus.



Slide 47: Prevent intermingling of wild waterfowl and wild or exotic birds with domestic poultry.

References

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2. Swayne, D.E., D.A. Nisbet, and D.L. Suarez. 2008 Avian Influenza. In A Laboratory Manual for the Isolation, Identification and Characterization of Avian Pathogens, 5th ed. L. Dufour-Zavala, D.E. Swayne, J.R. Glisson, L.E. Pearson, W.M. Reed, M.W. Jackwood, and P.R. Woolcock, eds. American Association of Avian Pathologists, Athens, GA. 28-134.
3. AVMA. 2006. Avian Influenza - Frequently Asked Questions. American Veterinary Medical Association. http://www.avma.org/public_health/influenza/avian_faq.asp

Images:

Slide 1: Influenza virus structure. (2006). Retrieved October 27, 2010 from:
<http://micro.magnet.fsu.edu/cells/viruses/influenzavirus.html>

Slide 4: Live bird market (2006). Retrieved January 4, 2011 from
http://www.news.cornell.edu/stories/May06/bird_market.jpg

Slide 6: Scheme of avian influenza pathogenesis and epidemiology [Diagram]. Retrieved August 26, 2009, from
<http://www.influenzareport.com/ir/ai.htm>

Slide 34: RT-PCR results for H5N1. (2006). Retrieved November 1, 2010 from
http://www.eurosurveillance.org/images/dynamic/EE/V13N30/H5N1_Bulgaria_Figure1.jpg

Slide 35: Real-time PCR results for H5N1. (2006). Retrieved November 1, 2010 from
http://www.eurosurveillance.org/images/dynamic/EE/V13N30/H5N1_Bulgaria_Figure2.jpg

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Random Sample
Pages for Preview