UNIVERSITY of GUELPH

ANIMAL HEALTH LABORATORY

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Summary of Influenza A virus testing

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STEP 1	**VIRUS DETECTION TESTING**	**ANTIBODY DETECTION TESTING**	
Test	**Real-time PCR - matrix gene**	**ELISA, Multi-Screen**	**Agar gel immunodiffusion**
Sample	Swabs in VTM (swine-nasal, birds-cloacal/tracheal), oral fluids, tissues	Serum	
Use/advantage	Primary screening test targeting a conserved influenza virus gene. Detects all common Influenza A virus subtypes in multiple animal species, very sensitive, fast.	Primary screening test, detects antibody from all common Influenza A virus subtypes in multiple animal species.	Screening test used for avian samples.
Disadvantage	Cannot determine the subtype of the virus.	Cannot determine the subtype of the virus to which animals were exposed. Cannot be used on paired samples to determine a 4-fold titer change/seroconversion.	

STEP 2	**VIRUS SUBTYPING**		**ANTIBODY SUBTYPING**
Sample	PCR positive sample		Serum
Test	**PCR typing for specific subtypes**	**Hemagglutinin gene sequencing**	**Hemagglutination inhibition test** (E.g., H1N1, H3N2, H3N8 – other subtypes may be available upon request)
Use/advantage	Swine: H1N1& H3N2 Turkeys: H5& H7, also H1N1& H3N2 All other avian species: H5 & H7 Simpler, faster than sequencing.	Covers all common Influenza A virus subtypes. Allows strain identification and comparison of various viruses.	Use on paired samples to determine a 4-fold titer change/seroconversion.
Disadvantage	Detects only H1N1, H3N2, H5 & H7 subtypes Weak positives may not have enough virus for typing.	Weak positives may not have enough virus for typing.	Subtype/strain specific-depending on antigen used.

OTHER TESTS

Test	**Immunohistochemistry**
Sample	Formalin-fixed tissues
Use/advantage	Used on fixed tissues when fresh tissues are not available, or as a part of postmortem procedures. Detects all common Influenza A virus subtypes.
Disadvantage	Cannot determine the virus subtype.

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