



Diagnosing respiratory disease in backyard chickens

Emily Martin, Emily Brouwer, Kate Todd

Veterinarians who treat backyard flocks are often faced with respiratory signs that can be the result of different etiologies. Respiratory signs can include rales (fine crackles), snicking (sneezing), watery eyes, fluid or mucus from nostrils, swollen head, gaping (open-mouth breathing), gasping, or head shaking. The birds may or may not be depressed but if they are, they will be down on the ground with their feathers fluffed up and their eyes closed. Morbidity and mortality will be variable. How do you approach diagnosing these flocks? Your first consideration should be diagnostic testing prior to treatment. Treatment prior to testing will compromise lab results and the ability to obtain a diagnosis.

If there is **no mortality**, you could consider drawing blood from a few birds (if the birds can tolerate handling) and run ELISAs (**Table 1**). In unvaccinated flocks, any rise in titer will indicate exposure and is the least expensive testing. Swabs (gel or viral transport medium) of the choanal slit and/or trachea could also be collected to run any of the PCR tests for specific diseases.

If there is **mortality**, then there is an opportunity for postmortem examination and more intensive sampling. Postmortem examination could be done at a clinic or birds could be shipped to AHL. If birds are shipped, please refer to the AHL website for a PM submission form

(<https://www.uoguelph.ca/ahl/submissions/submission-forms>) and packaging instructions (<https://www.uoguelph.ca/ahl/submissions/ahl-labnote-27-submission-instructions>).

Clinic postmortem: If the head is swollen, you can cut across the beak and then cut the skin under one of the eyes to **access the infraorbital sinus**. Swabs can be taken for bacteriology or mycoplasma testing.

Once you **open the oral cavity**, you can look for oral plaques and examine the laryngeal opening for yellow caseous material. Rule outs include wet pox or ILT. Collect pieces of the larynx/trachea for pox and/or ILT PCR as well as a piece of larynx/trachea (eyelid, lung) for histology given that both tests are needed to confirm ILT. ILT is an immediately notifiable disease that requires OMAFRA and CFIA notification. These organizations may call to ask a few questions regarding the affected flock.

Cut down the trachea to look for worms (gapeworm is not commonly diagnosed). Open the birds to examine the lungs. Lung changes could include congestion, edema, yellow caseous material filling airways or over the pleural surface, and nodules. Yellow caseous material could indicate bacterial involvement (i.e. *Staphylococcus aureus*, *E. coli*). It is always a good idea to divide at least one lung in half and put one half in formalin and keep the other half for other testing. Both fungus and bacteria can create nodules in the lungs.

Two final areas to check are air sacs (normally clear like plastic wrap) that could be clouded or filled with fluid and/or caseous material. **Air sacs could be swabbed for bacterial culture.** Also **check the syrinx** as this is a key place for fungal organisms to settle out, grow, block the airway, and result in death by asphyxiation.

For more information on respiratory diseases in chickens, please refer to the OAHN website: <https://oahn.ca/resources/respiratory-diseases-of-small-flock-poultry/> and: <https://oahn.ca/resources/oahn-small-flock-poultry-veterinary-resources-2019/>.

Table 1. List of chicken respiratory disease tests available at the AHL.

Disease (by lab section)	PCR	ELISA	Culture
Virology lab			
Newcastle/APMV-1 (avian paramyxovirus 1)	X	X	
IBV (infectious bronchitis virus)	X	X	
ILTV (infectious laryngotracheitis virus)	X		
Avian influenza/influenza A	X		
Poxvirus	X		
Mycoplasma lab			
Mycoplasma (<i>M. gallisepticum</i> , <i>M. synoviae</i>)	X (MG or MS)	X (MG/MS)	X
Bacteriology lab			
Bacterial culture			X
Mycology/fungal culture			X

Sampling summary:

NOTE: If screening a flock for disease, up to 5 swabs or tissues can be pooled for PCR testing. PCRs are generally the preferred test as they target specific diseases and can be done quickly.

Live bird testing:

- Blood for ELISAs - limited number of tests available, but lower cost.
- Choanal slit/tracheal swab (gel swab or viral transport medium) for PCR (wider selection of tests.)
- Photos of affected birds can be submitted to AHL along with the case history.

Dead bird testing:

NOTE: If a postmortem is declined, swabs from the choanal slit/trachea could still be collected for PCR.

- **Postmortem** - key test for lesion identification and sample collection.
- **Histology** - an option to screen tissues for lesions or determine the etiology of specific lesions such as nodules (bacterial, fungal, neoplasm). Collect a wide variety of tissues to place in formalin, including all major organs: lung, liver, spleen, and kidney.
- **PCR tests** can be run on swabs or tissues. If you are sending tissues, please remember to package each tissue type separately and do not mix intestinal tissue with organ tissue. PCR is a fast test to screen quickly for multiple diseases.
- **Bacterial/fungal culture** can be run on swabs or tissues. Culture will screen for multiple bacterial organisms and our MALDI-TOF MS system is used for identification.
- **Mycoplasma** can be run on swabs or tissues. PCRs are fast and will test for the key species. Culture is available but results take more than a week. If high mortality and/or clinical signs lead you to suspect avian influenza or Newcastle disease – phone CFIA!