UNIVERSITY OF GUELPH
Laboratory Services Division
Animal Health Laboratory

AHL Newsletter

AHL Newsletter, Volume 29, Number 2 **June 2025**

In this issue:

AHL Newsletter
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The *AHL Newsletter* is published quarterly (March, June, September, December) by the Animal Health Laboratory, Laboratory Services Division, University of Guelph.
Its mission is to inform AHL clients and partners about AHL current activities, and laboratory-based animal disease events and disease trends. *Ideas and opinions expressed herein do not necessarily reflect the opinions of the University or the editor.*

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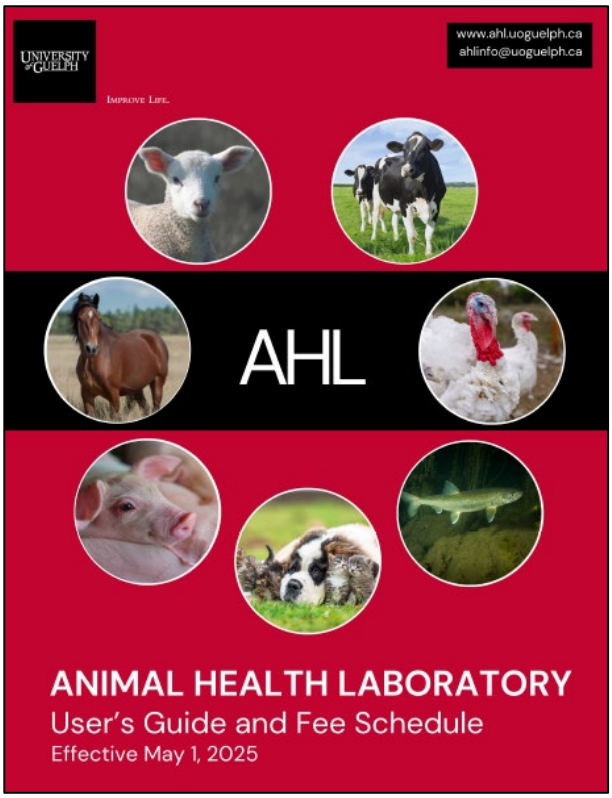
To receive an **electronic copy of this Newsletter**, please send your email address to us at holiver@uoguelph.ca

AHL User's Guide and Fee Schedule - May 1, 2025

Includes updated test information, new tests, new test panels, and more!

Mobile friendly! Available on-line at https://www.uoguelph.ca/ahl/

Test information is linked to LabNotes to facilitate test selection and interpretation of results.



New and revised tests since May 2024:

- Avian metapneumovirus type A, B, C (AMPV A, B, C) - PCR
- Bacterial culture, fecal, food animal (small ruminant)
- Canine C-Reactive Protein - photometric
- Chicken anemia virus genotyping
- Epizootic haemorrhagic disease virus - antibody ELISA
- Equine adenovirus/Equid herpesvirus 1&4/Equid herpesvirus 2&5 PCR
- Equine respiratory PCR panel
- Fish *Lactococcus* culture, farmed fish
- Fowl adenovirus 11 virus neutralization test
- Fowl adenovirus 8a virus neutralization test
- Fowl adenovirus 8b virus neutralization test
- Mastitis, environmental culture
- *Mycoplasma hyopneumoniae* - ID Screen antibody ELISA
- *Salmonella* typing - CTS

Update from the Director

The view from the Director's office

June 2025 is audit time for AHL. A site visit team of four auditors from the American Association of Veterinary Laboratory Diagnosticians (AAVLD) will be visiting us June 2-5; their task will be to examine the quality system involving all administrative and scientific sections of AHL operations. AHL is one of 4 Canadian veterinary diagnostic laboratories that are currently AAVLD-accredited. There are also 35 accredited US labs. Site visits occur every 5 years to ensure that the laboratory maintains the quality management system standards established by the AAVLD Accreditation Committee. Successful re-accreditation provides AHL clients with an assurance of high quality and credible laboratory results. If you are interested in more details regarding the AAVLD Accreditation Program, please check out this web-site reference: https://www.aavld.org/accreditation-program-2

As part of the audit, a group of AHL stakeholders and clients is invited to meet with the audit team to discuss their interactions with AHL – both positive experiences and those that did not meet client expectations. We welcome this valuable feedback as an important means of ensuring continual improvement. As always, a huge thanks to AHL's quality assurance team who spend many hours preparing us for this important audit.

I hope that you are able to take some time off to enjoy a great Canadian summer with your families and friends.

Maria Spinato, Director

Animal Health Laboratory, University of Guelph, Guelph, ON.

SR update: Shipment of coolers

Jen Zoethout, Tim Pasma

Animal Health Laboratory, University of Guelph, Guelph, ON.

AHL Newsletter 2025;29(2):4.

Effective April 1, 2025, Purolator has initiated an additional handling charge. This charge will be applied to any shipments of styrofoam coolers and hard-sided coolers used as the outer packaging. Please note that styrofoam coolers with an outer cardboard box are exempt from this handling charge. The charge is approximately $20 per shipment, effectively doubling the cost of an incoming shipment to the AHL. We are asking that clients refrain from using styrofoam and/or hard-sided coolers if possible when shipping via Purolator. This does not apply to submissions of carcasses for postmortem; please continue to use impermeable hard-sided packaging for these submissions. Thank you for helping us to maintain courier costs at reasonable levels.

For any questions, please contact AHL Specimen Reception (phone: 519-824-4120 Ext. 54530, email: specroom@uoguelph.ca)

New external PCR tests available for swine

Jen Zoethout, Tim Pasma

Animal Health Laboratory, University of Guelph, Guelph, ON.

AHL Newsletter 2025;29(2):4.

To our valued clients in the swine sector, effective May 1, 2025, the AHL will be changing our provider of a few external porcine PCR tests to a Canada-based laboratory, Prairie Diagnostic Services. The porcine PCR tests affected are as follows:

Atypical porcine pestivirus
Porcine astrovirus type 3
Porcine astrovirus type 4
Porcine parainfluenza virus type 1
Porcine sapelovirus
Porcine teschovirus

This change in service provider will help to reduce shipping and handling costs, improve turnaround times, and will result in overall savings for our clients.

For any questions, please email ahlinfo@uoguelph.ca or phone 519-824-4120, ext. 54530.

CRP added to canine biochemistry panel as of May 1

Kris Ruotsalo

Animal Health Laboratory, University of Guelph, Guelph, ON.

AHL Newsletter 2025;29(2):5.

Canine C-reactive protein (CRP) is now included in the biochemistry profile. CRP is a positive acute phase protein. Increases are non-specific in nature, and can occur rapidly in response to inflammation, infection, immune-mediated disease, neoplasia, and trauma. Concentrations decrease rapidly with resolution of the inciting stimulus.

Please refer to the AHL newsletter article, 2024;28(4):30 "C- reactive protein: A major acute phase protein in dogs" for additional information. https://www.uoguelph.ca/ahl/content/feature/ahl-newsletter-december-2024/

AHL Bacteriology section update on equine MIC plates

Durda Slavic, Sarah Lippert

Animal Health Laboratory, University of Guelph, Guelph, ON.

AHL Newsletter 2025;29(2):5.

The AHL bacteriology section will begin using a new MIC plate format for our equine cases starting in June 2025. On this new plate format, azithromycin, ticarcillin and ticarcillin/clavulanic acid are discontinued. However, the MIC range of other antimicrobials on the plate is extended, providing better alignment with CLSI interpretation guidelines. In addition, minocycline has been added to the plate. Please contact the bacteriology laboratory at ahlbact@uoguelph.ca if you have any questions or concerns regarding this updated MIC equine test.

OAHN Update – June 2025

Mike Deane, Tanya Rossi

Animal Health Laboratory, University of Guelph, Guelph, ON.

The Ontario Animal Health Network (OAHN) has had a busy spring, having held our OAHN Annual General Meeting (AGM), and the Ontario Indigenous Fish Health Day, and also produced multiple reports and veterinary resources.

Ontario Avian Influenza Cases and Resources 2025

In order to track Ontario avian influenza cases this year, we have published a page to collect all relevant releases from the Ontario Feather Board Command Centre, OMAFA, and the CFIA, in order to keep you as informed as possible. Check it out here, and please let us know if there are resources or news that we are missing: https://www.oahn.ca/resources/ontario-avian-influenza-cases-and-resources-2025/

OAHN AGM Speaker Series 2025

As part of the 2025 OAHN AGM, we presented three keynotes for our members and other veterinarians to attend. The speakers and subjects of their talks are below, as well as a link to the page where you can view them. This page is for veterinary professionals, so you must be registered and logged in on OAHN.ca to access.

- Following influenza A as it moves through North America by Dr. Carol Cardona
- The European aMPV experience: Prevention and disease presentation by Dr. Stephane Lemiere
- H5N1 surveillance in U.S. horses by Dr. Feng Li

Visit these presentations here: https://www.oahn.ca/resources/oahn-agm-speaker-series-2025/

Indigenous Fish Health Day

The Ontario Animal Health Network for Aquatic Animals organized the Indigenous Fish Health Day on May 8, to present information and answer questions in a non-regulatory, open discussion format. OAHN is dedicated to information dissemination and knowledge transfer. We were fortunate to have presentations from experts at the CWHC, OMAFA, the AHL, and Skretting Canada. View the presentations here: https://www.oahn.ca/resources/ontario-indigenous-fish-health-day-recordings-and-resources/

New Reports

The following are the most recent reports published by OAHN. We publish regularly, so be sure to check back in between newsletters to see what's new. To view any of the veterinary reports below, please click on the link for each report, or go to OAHN.ca and navigate to the species in which you are interested.

Swine Network - https://www.oahn.ca/reports/swine-veterinary-report-q4-2024/

- H5N1 Highly Pathogenic Avian Influenza (HPAI) updates
- Influenza A (IAV)- H3N2 clade 2010.1 detected for the first time in Quebec swine

- Porcine Epidemic Diarrhea (PEDV)/Porcine Deltacoronavirus (PDCoV)
- OAHN veterinary clinical impression survey veterinary comments
- Laboratory diagnostic reports
- Ontario slaughter statistics
- CanSpotASF surveillance update
- OAHN project update- Porcine Hemagglutinating and Encephalomyelitis Virus (PHEV)
- International disease topics of interest summary

Poultry Network - https://www.oahn.ca/reports/oahn-poultry-expert-network-quarterly-veterinary-report-q1-2025/

- Highly Pathogenic Avian Influenza (HPAI) H5N1 – What mammals are affected?
- Poultry veterinary survey highlights – Q1 2025
    - Broilers
    - Broiler-Breeders
    - Layers
    - Turkeys
    - Rural/Backyard/Non-Quota Flocks
- Events and news

Staff highlights

Congratulations to Megan MacAlpine, Team Lead in the AHL Postmortem laboratory on winning the March 2025 University of Guelph “G” Thanks! award.

In her nomination, Dr. Emily Brouwer shared:

“Megan is an incredibly knowledgeable and efficient technician in the postmortem room. She can juggle the needs of AHL pathologists, Pathobiology faculty and students, and various OVC faculty with a smile on her face. Megan helps bereaved pet owners on their worst day - she is so compassionate and such an asset to the team. Thank you, Megan!”

A small celebration was held for Megan to acknowledge her achievement.

“G” Thanks! is a program within the GREAT at U of G initiative, focused on fostering gratitude, recognition, and appreciation at the University of Guelph. Each month, “G” Thanks! is open for nominations from the University community for faculty and staff who want to appreciate, recognize, or show gratitude for one of their colleagues.

Unusual ocular neoplasia in a bovid

Lisa Gordon

Animal Health Laboratory, University of Guelph, Guelph, ON.

AHL Newsletter 2025;29(2):9.

An adult Holstein bovid presented to the referring veterinarian for an ocular mass (**Fig. 1**). A piece of tan, multinodular tissue that was not recognizable as a globe was received for histological examination. One edge of one sample was lined by a non-keratinizing stratified squamous epithelium (consistent with conjunctiva or anterior corneal epithelium). Between 90 – 100% of the tissue was effaced and replaced by sheets, streams, interlacing bundles, and packets of monomorphic, large, usually spindle and less commonly round cells embedded between dense trabeculae of stroma that included numerous melanomacrophages (**Fig. 2**). The cells had variably distinct cell borders, scant eosinophilic cytoplasm and an elongate, oval, or round nucleus with coarsely stippled chromatin and 0-2 large, prominent nucleoli. There is scattered fine brown/black pigment scattered within the stroma, and possibly within the cytoplasm of the neoplastic cells. There was 2-fold anisocytosis and anisokaryosis, and 4 mitotic figures were counted in 2.37 mm^2 (10 HPFs). A spindle cell neoplasm was diagnosed, and differentials included a melanocytic tumour and soft tissue tumour (soft tissue sarcoma).

The most frequent ophthalmic neoplasms in cattle are squamous cell carcinoma (SCC) and lymphoma, but the submitted neoplasm was not consistent with either entity. There are also rare case reports of post-traumatic ocular sarcomas in cattle.

Based on the differential list, immunohistochemistry was performed for S-100 (a cytoplasmic calcium-binding protein) and MelanA/PNL2 (melanocyte-specific antigens). S-100 has been demonstrated to positively label both melanocytic tumours and nerve sheath tumours (schwannoma, neurofibroma, and occasionally, malignant nerve sheath tumours) in cattle. A few individual case reports and case series have demonstrated positive labelling of well-differentiated melanocytic tumours with MelanA in cattle. It is unclear whether PNL2 is useful in this species. In this case, there was strong cytoplasmic labelling of the neoplastic cells with S100, and no labelling of cells with MelanA/PNL2 was detected.

Based on the overall histologic pattern and immunolabelling, the top differential for the neoplasm is a poorly differentiated melanocytic tumour, with nerve sheath tumour as another possibility. Cattle develop melanocytomas infrequently, and there are rare reports of (malignant) melanoma in cattle; these are predominantly reported in the skin. A congenital intraocular melanocytoma has been reported in a calf. Due to the paucity of research in this area, the key defining features of a melanocytoma vs. melanoma in cattle are unclear. While nerve sheath tumours are commonly reported in cattle, the globe does not seem to be a predilection site. Additional immunohistochemical stains (e.g., HMB45, a premelanosome protein, positive in some bovine melanocytic tumours) could have allowed for additional subclassification of this neoplasm, but were not pursued for this case.

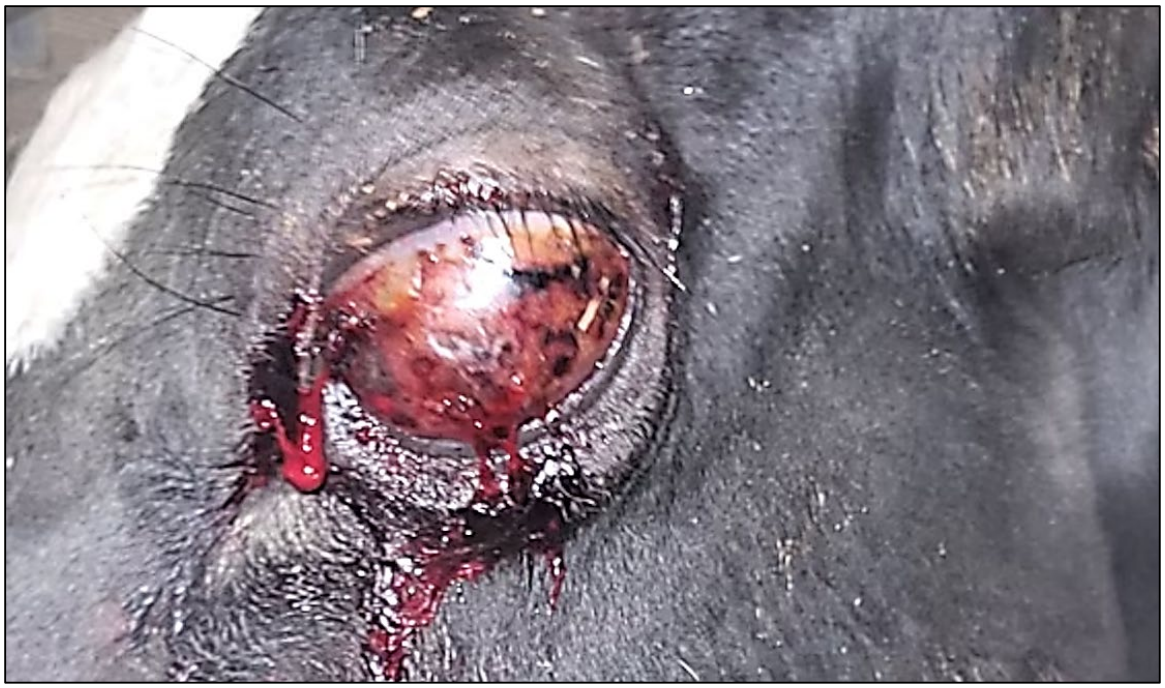


Figure 1. Globe, left. A tan mass occupies the left orbit.

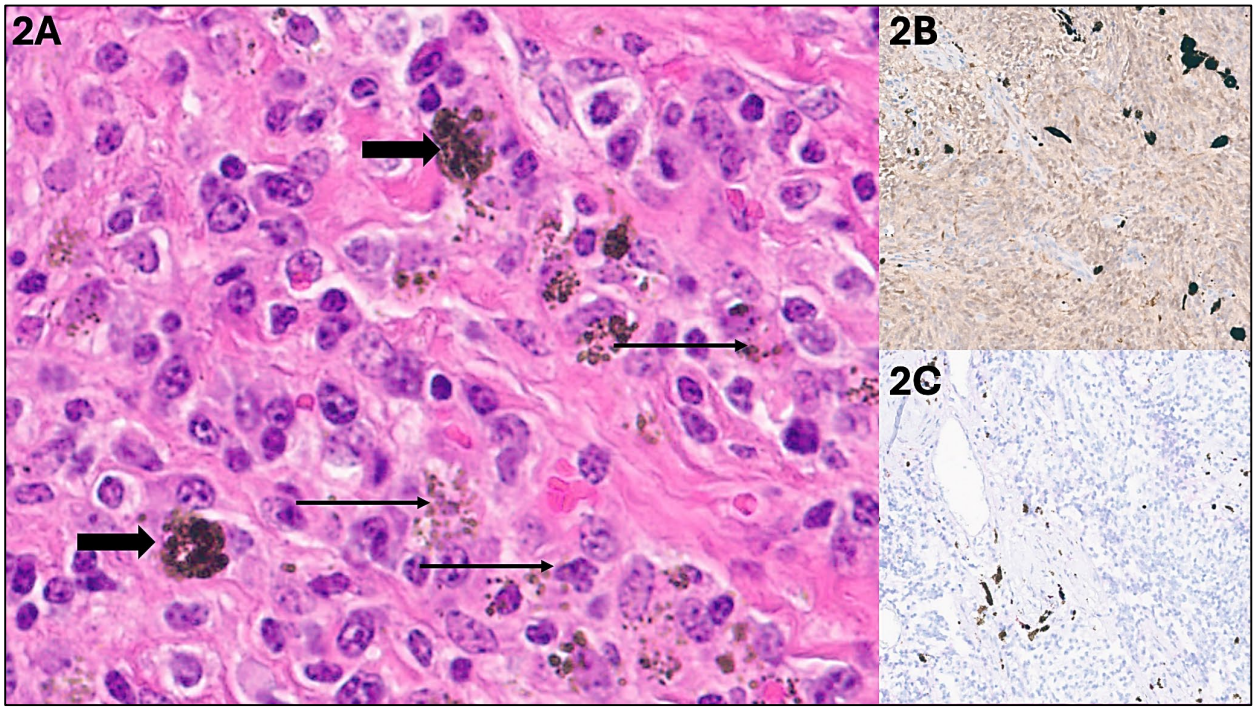


Figure 2. Ocular mass. **2A**. 40X, H&E stain. The cells in this field are mostly round to polygonal in shape. There are scattered deeply pigmented cells, interpreted as melanomacrophages (thick arrow). There is scattered melanin pigment which could be within the interstitium, or possibly within the

cytoplasm of the neoplastic cells (thin arrow). **2B**. 10X. IHC S110; brown chromogen. There is strong cytoplasmic labelling of the neoplastic cells with S100. **2C**. 10X. IHC MelanA/PNL2; purple chromogen. No labelling of cells with MelanA/PNL2 was detected.

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6. Javanbakht J, et al. Comparative histopathological diagnosis of cutaneous melanoma by H&E, special staining and immunohistochemical methods against cutaneous squamous cell carcinoma in horse and bovine. J Bioanal and Biomed. 2014:6:19-23.
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SWINE

Foot and mouth disease review: Resources

Josepha DeLay

Animal Health Laboratory, University of Guelph, Guelph, ON

AHL Newsletter 2025;29(2):12.

Recent foot and mouth disease (FMD) outbreaks in Europe and the Near East have prompted swine organizations to increase awareness of this foreign animal disease (FAD) among veterinarians and producers. European outbreaks currently involve Hungary and Slovakia; Germany has been declared FMD-free following an outbreak in January 2025. Outbreaks in Bahrain, Iraq, and Kuwait, where FMD is endemic, have involved an exotic strain of the virus.

A recorded webinar organized by the Swine Health Information Center (SHIC) and the American Association of Swine Veterinarians (AASV) provides useful information on the outbreaks, with the goal of preventing introduction of the virus to North America:

https://iastate.app.box.com/s/9x4s55vka2mcszj28kgq5r0t8yt62stb

The Iowa State University Swine Disease Manual offers a concise summary of FMD transmission and lesions:

https://vetmed.iastate.edu/vdpam/about/focus-areas/swine/swine-disease-manual/index-diseases/foot-mouth-disease

Excellent images of swine FMD lesions are published by the Iowa State University's Center for Food Security and Public Health (CFSPH):

https://www.cfsph.iastate.edu/pdf/foot-and-mouth-disease-progression-of-lesions

Of particular note is the development of focal 'blanching' of coronary band skin as a very early lesion of FMD, prior to formation of vesicles.

Porcine circovirus testing results at the Animal Health Laboratory

Davor Ojkic, Josepha DeLay

Animal Health Laboratory, University of Guelph, Guelph, ON

AHL Newsletter 2025;29(2):12.

PCR testing to determine PCV2 and PCV3 infection status is valuable for diagnostic and monitoring purposes in Ontario swine herds. Genotyping of PCV2 amplicons in PCR-positive cases can provide additional information regarding the specific virus subtype infecting a herd, subtype correlation with clinical disease, and comparison with genotypes included in available vaccines.

Annual PCV2 and PCV3 PCR results at the AHL for 2022, 2023, and 2024 are listed (**Tables 1 and 2**). PCV2 and PCV3, as well as PCV1, are included in the same triplex PCR assay, resulting in the same total number of annual tests for each virus. The non-pathogenic PCV1 is included in the assay for completeness.

Table 1. AHL PCV2 PCR results by case, 2022-2024.

PCV2	2022	2023	2024	TOTAL
Positive	337	301	269	907
Negative	547	1,046	1,219	2,812
Inconclusive	65	21	11	97
TOTAL	949	1,368	1,499	3,816

Table 2. AHL PCV3 PCR results by case, 2022-2024.

PCV3	2022	2023	2024	TOTAL
Positive	476	617	407	1,500
Negative	447	723	1,084	2,254
Inconclusive	26	28	8	62
TOTAL	949	1,368	1,499	3,816

PCV2 sequencing and genotyping is requested by clinicians for relatively few PCV2 PCR-positive cases (**Table 3**). Despite the small sample size, this subset does provide information regarding the PCV2 subtypes present in Ontario swine. PCV2 genotyping results over the 6 year span from 2019-2024 are provided in (**Table 4**). These results are also presented on an annual percentage basis (**Fig.1**), demonstrating the frequency of genotype identification each year. The small number of cases that are genotyped does not provide definitive information on the prevalence of PCV2 genotypes in Ontario, but the results do indicate that all recognized PCV2 genotypes except PCV2c have been detected recently in swine from this province. To determine the clinical significance of PCV2 infection, correlation with clinical findings histologic lesions, and PCV2 immunohistochemistry (IHC) or *in situ* hybridization (ISH) results is necessary.

Table 3. Frequency of PCV2 genotyping requests at the AHL, 2022-2024.

PCV2	2022	2023	2024
Total PCV2 PCR-positive cases	337	301	269
PCV2 PCR-positive cases genotyped	1 (0.3%)	4 (1%)	17 (6%)

Table 4. AHL PCV2 genotyping results by case, 2019-2024.

Year / PCV2 subtype	PCV2a	PCV2b	PCV2d	PCV2e	TOTAL
2019	0	1	2	0	3
2020	8	4	0	0	12
2021	7	1	0	1	9
2022	0	0	1	0	4
2023	2	0	1	1	4
2024	6	0	10	1	17

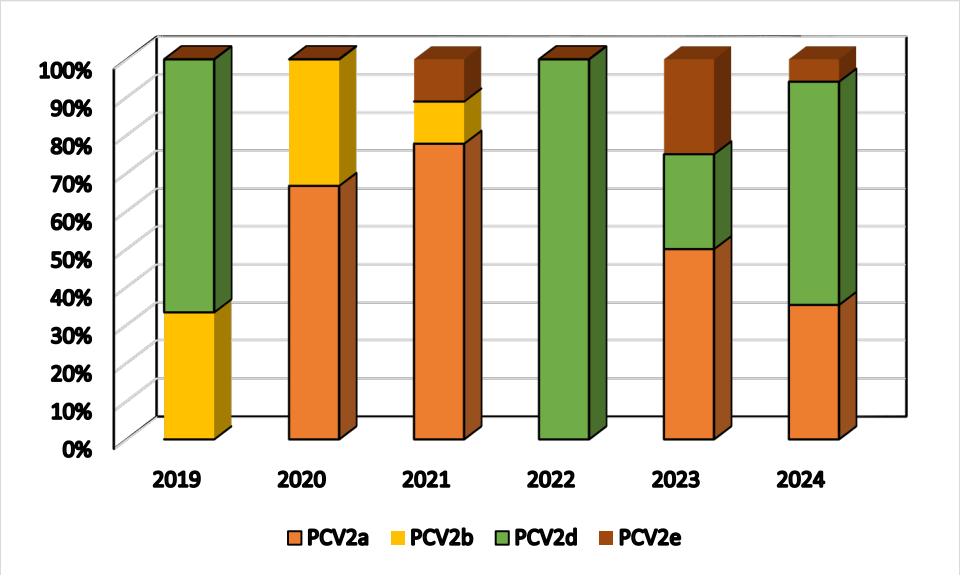

Figure 1. AHL PCV2 genotyping results on an annual percentage basis, 2019-2024.

Reference

1. Segales J, Sibila M. Revisiting porcine circovirus disease diagnostic criteria in the current porcine circovirus 2 epidemiological context. Vet Sci 2022;9(3):110.

Enteritis due to *Lawsonia intracellularis* in hamsters

Andrew Brooks, Emily Martin, Emily Brouwer

Animal Health Laboratory, University of Guelph, Guelph, ON.

AHL Newsletter 2025;29(2):15.

Multiple cases of enteritis in hamsters due to *Lawsonia intracellularis* infection were diagnosed this spring at the AHL. Three of the cases were postmortem submissions and one case consisted of formalin-fixed viscera submitted for histopathology. The hamsters were between 3 to 6 months of age and exhibited various clinical signs, including diarrhea, lethargy, anorexia, respiratory difficulties and sudden death.

In the hamsters submitted for postmortem examination, gross lesions included necrosis and inflammation of the intestine, predominantly affecting the ileum, with variable involvement of the jejunum, cecum and proximal colon. The intestine was described as thickened, hyperemic and firm, with necrosis evident on the mucosal surface. Histologically, the intestinal lesions consisted of hyperplasia of the crypt epithelium (**Fig. 1A)**, with thickening of the mucosa, variable degrees of necrosis and inflammation. A mixed population of extracellular bacteria was often present in the necrotic debris. In some cases, the necrosis was severe (**Fig. 1B**), and extended through the wall of the intestine resulting in peritonitis. Bacterial culture of the intestine was performed in two submissions: in one case no bacterial pathogens were detected, and in the other case, large numbers of *E. coli* and *Fusobacterium varium* were isolated. *Salmonella*, *Campylobacter*, *Yersinia*, *Clostridium perfringens* and *Clostridium difficile* were not isolated. *Lawsonia intracellularis* was detected by PCR in the three postmortem submissions, with Ct values ranging from 8.45 to 14.46.

Proliferative ileitis due to *Lawsonia* is common in hamsters, and can cause high morbidity and mortality. Disease occurs most often in young hamsters, especially during the post-weaning period, and predisposing factors may include transportation, dietary changes and overcrowding. Clinical signs may include lethargy, diarrhea and dehydration. Lesions typically involve the ileum and consist of hyperplasia of the intestinal crypt epithelium with variable degrees of necrosis and inflammation, as seen in these cases. Although the crypt proliferation is highly characteristic of this disease, further etiologic confirmation can be performed by demonstrating the presence of typical slender curved bacteria within the apical cytoplasm of enterocytes in a Warthin-Starry silver-stained section. *Lawsonia* infection can also be confirmed by immunohistochemistry or PCR.

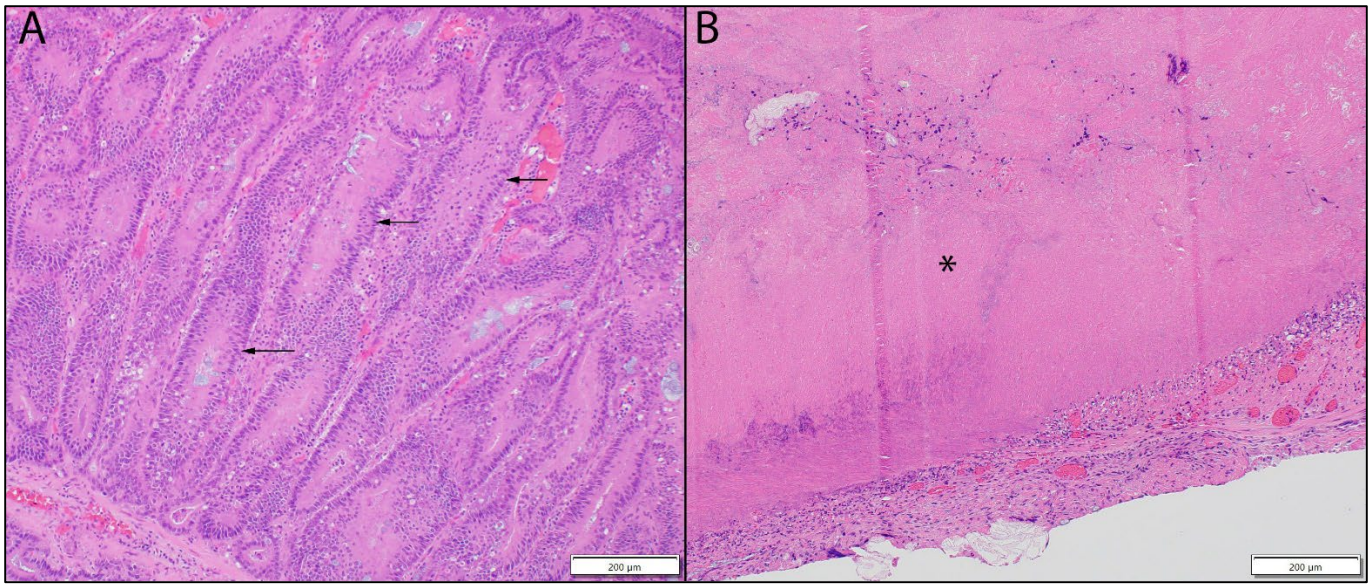

Figure 1. Proliferative enteritis due to *Lawsonia intracellularis* infection in a young hamster. **(A)** Note the marked hyperplasia of the crypt epithelium (arrows) resulting in thickening of the mucosa. **(B)** In some cases, the necrosis (*) extended across the wall of the intestine. H&E stain.

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1. Barthold SW, Griffey SM, Percy DH. Pathology of Laboratory Rodents and Rabbits, 4th ed. Wiley Blackwell, 2016:183-184.

Reproductive carcinoma and metastatic mineralization in a male rat

Siobhan O'Sullivan

Animal Health Laboratory, University of Guelph, Guelph, ON.

AHL Newsletter 2025;29(2):16.

A 3-year-old male rat with a chronic history of laboured breathing developed acute hematuria/pyuria prior to sudden death. Postmortem examination revealed a 2.0 cm x 2.0 cm firm tan/red mass in the caudal abdomen, involving the seminal vesicles and widely adherent to the urinary bladder. There was also thrombosis of the left atrium of the heart. Histopathology confirmed effacement of the seminal vesicles by an adenocarcinoma which was largely necrotic (**Fig. 1**). Acute hematuria/pyuria was attributed to this adenocarcinoma, with neutrophils, hemorrhage and bacteria present in the adjacent normal tubules of the seminal vesicles. There was metastasis to one adrenal gland, which was completely effaced by neoplasia. There was also marked chronic degenerative nephropathy and marked metastatic mineralization of the pulmonary parenchyma and blood vessel walls in various tissues (**Fig. 2**).

Male rats have multiple accessory sex glands; those closest to the urinary bladder are the prostate, ampullary glands, and seminal vesicle. While the seminal vesicles were grossly involved, the size of the neoplasm around the bladder indicates that this adenocarcinoma may have originated in any of the accessory glands. Spontaneous adenocarcinoma of the accessory sex glands is periodically reported in male rats, as it is in most species. Metastatic mineralization was an unexpected finding. Most often the term 'metastatic' is used in pathology to refer to the systemic dissemination of neoplasia, but 'metastatic mineralization' refers to the systemic deposition of mineral secondary to any disease state that induces hypercalcemia. Some carcinomas are known to induce hypercalcemia and metastatic mineralization; this is a recognized paraneoplastic syndrome known as humoral hypercalcemia of malignancy. Chronic renal disease, also seen in this rat, is a more common cause of metastatic mineralization, and may have been the inciting cause in this case.

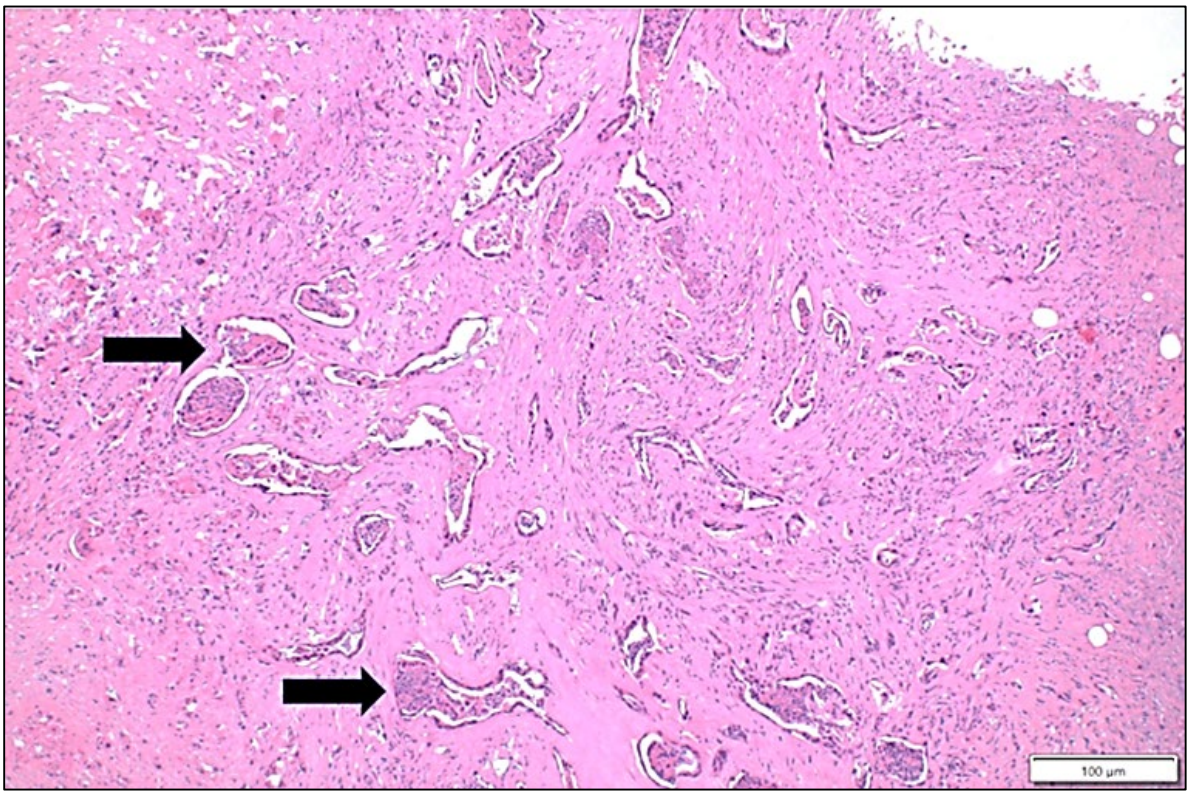

Figure 1. Rat, seminal vesicle. The seminal vesicle is effaced by adenocarcinoma. Irregular tubules (arrows) lined by neoplastic epithelial cells contain cell debris, and are embedded in a thick desmoplastic fibrous stroma. H&E stain.

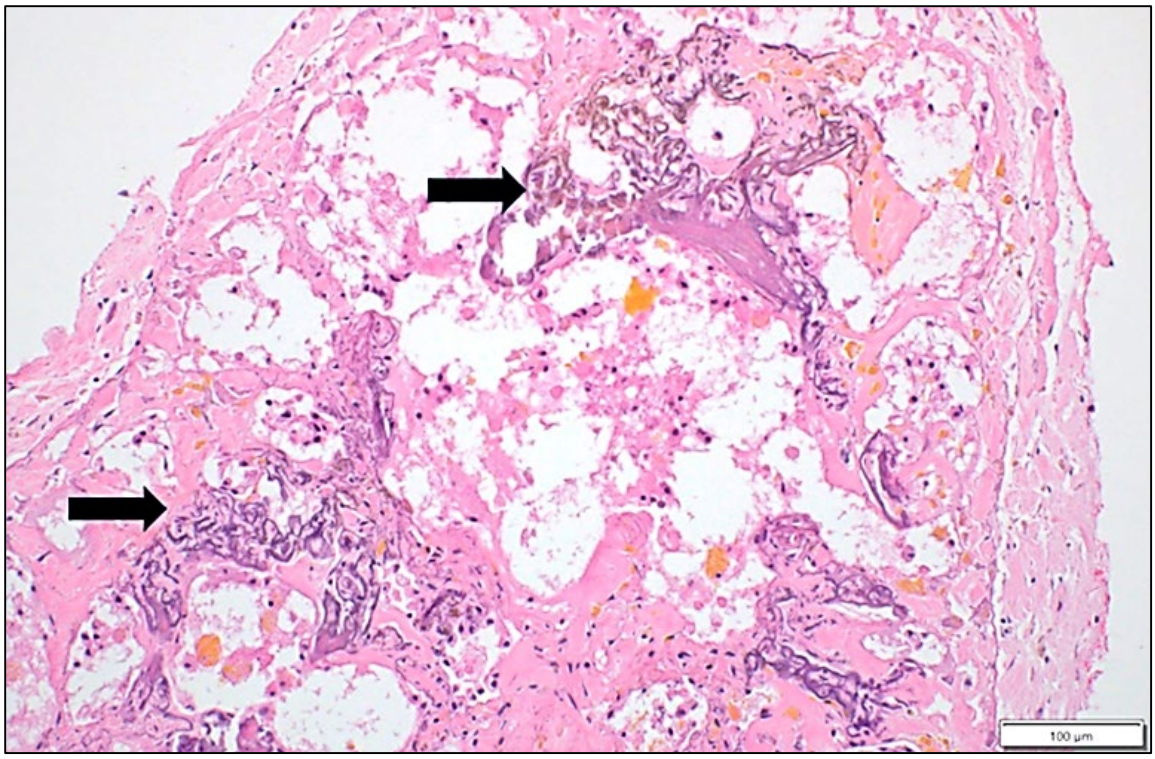

Figure 2. Rat, lung. Metastatic mineralization with irregular deposits of basophilic mineral (arrows) expanding the alveolar interstitium. H&E stain.

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AHL interactive animal pathogen dashboards: New poultry disease dashboards

Tanya Rossi, Tatiana Petukhova, Cathy Bauman, Michele Guerin, Zvonimir Poljak, and Maria Spinato

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AHL Newsletter 2025;29(2):18.

The Interactive Animal Pathogen Dashboard (IAPD) project was initiated in late 2020 with the goal of using Animal Health Laboratory data in real-time animal disease surveillance efforts. The resulting

dashboards were built with input from practicing veterinarians and government animal health experts to address needs in clinical decision making, client education, and regulatory strategy. The dashboards display temporal, and where possible, spatial trends in laboratory test submissions, positives and percent positivity from the previous ten years. Where appropriate, subtyping information is also available to track emerging strains and inform prevention plans such as vaccination. Displayed data are presented in aggregate to protect client confidentiality and are refreshed daily. Free dashboard accounts are available to veterinarians in Ontario and government agencies in Canada, and at a nominal (cost-recovery) fee to commercial entities and research laboratories working in animal or public health.

Since the launch of the IAPD in December 2022, the project team has striven to supplement and enhance dashboards by listening to our stakeholders in production, veterinary medicine, and public health. This has been especially true of the poultry IAPDs which have been expanded from displaying three dashboards (infectious bronchitis virus, adenovirus, and infectious laryngotracheitis virus) upon the project's public launch, to eight dashboards in spring 2025.

The first of these additions were influenza A dashboards for both turkeys (**Fig. 1**) and chickens. The first two dashboard pages display influenza A matrix PCR results from the previous, three and ten-year periods. A third dashboard page displays subtype specific PCR results for H1, H3, H5 and H7. In the case of highly pathogenic avian influenza strains, a 7-day lag in IAPD reporting has been structured to allow time for formal reporting, as required by the Canada Food Inspection Agency (CFIA)'s regulatory mandate. In the past five years, there has been an increase in diagnostic testing for influenza A in poultry, especially in 2022, 2023 and winter/spring 2025. All identified cases have been the H5 strain with a few submissions "too weak to type". Confirmatory testing performed by CFIA's National Centre for Foreign Animal Diseases (NCFAD) identified the currently dominant H5N1 strain in all of these cases. This increase in laboratory testing for influenza is consistent with observed increases in disease incidence in North America, and has been expanded to include other domestic species - felines, pigs and cattle especially. The IAPD team has also published influenza dashboards for swine, bovids and equids, and is planning a feline dashboard in the near future.

In response to suggestions by poultry practitioners and public health officials, the IAPD team has created a dashboard for *Salmonella* in chickens. This dashboard includes separate graphs for bacterial culture results in clinical samples and environmental samples submitted from the Ontario Hatchery and Supply Flock program (OHSF). All positive culture results were subtyped by public health and are displayed in the second *Salmonella* dashboard page. Over the previous five years, submissions and positives for both clinical and OHSF samples have remained relatively consistent, as has the proportional prevalence of specific subtypes (**Fig. 2**). *S.* Kentucky remains the most commonly-isolated species.

The most recent addition to the poultry dashboards has been avian metapneumovirus (AMPV) dashboards for both turkeys and chickens. AMPV incidence in Canadian poultry, especially turkeys, sharply increased in spring 2024, and has remained endemic to date. Both subtypes A and B have been detected. Creation of these dashboards has highlighted the IAPDs' active response to new and reemerging pathogen surveillance.

To sign up for a dashboard membership please go to https://iapd.lsd.uoguelph.ca/ and click "get access". As membership is restricted to veterinarians, regulatory agencies, and animal health researchers, approvals are conducted manually and may take a few days. Accounts are free for food animal practices and government workers. For additional accounts or for commercial agricultural companies (pharma, feed, genetics), accounts are $300/year (our cost for viewer licenses). Please reach out to us at iapd@uoguelph.ca with any questions or feedback.

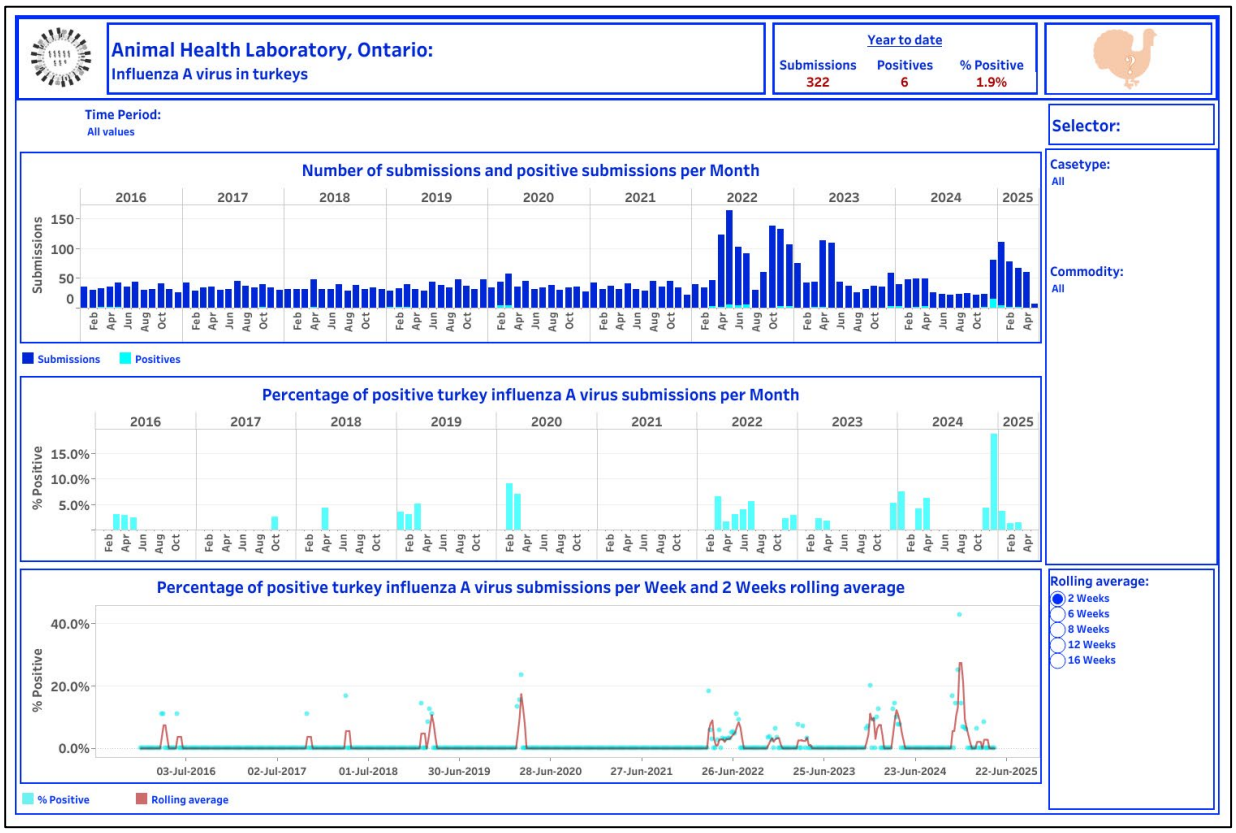

Figure 1: The Animal Health Laboratory's interactive animal pathogen dashboard for influenza A in commercial turkeys. Data displayed includes test results from a matrix PCR performed for clinical and monitoring purposes from 01-01-2016 to 08-05-2025. Research samples were excluded.

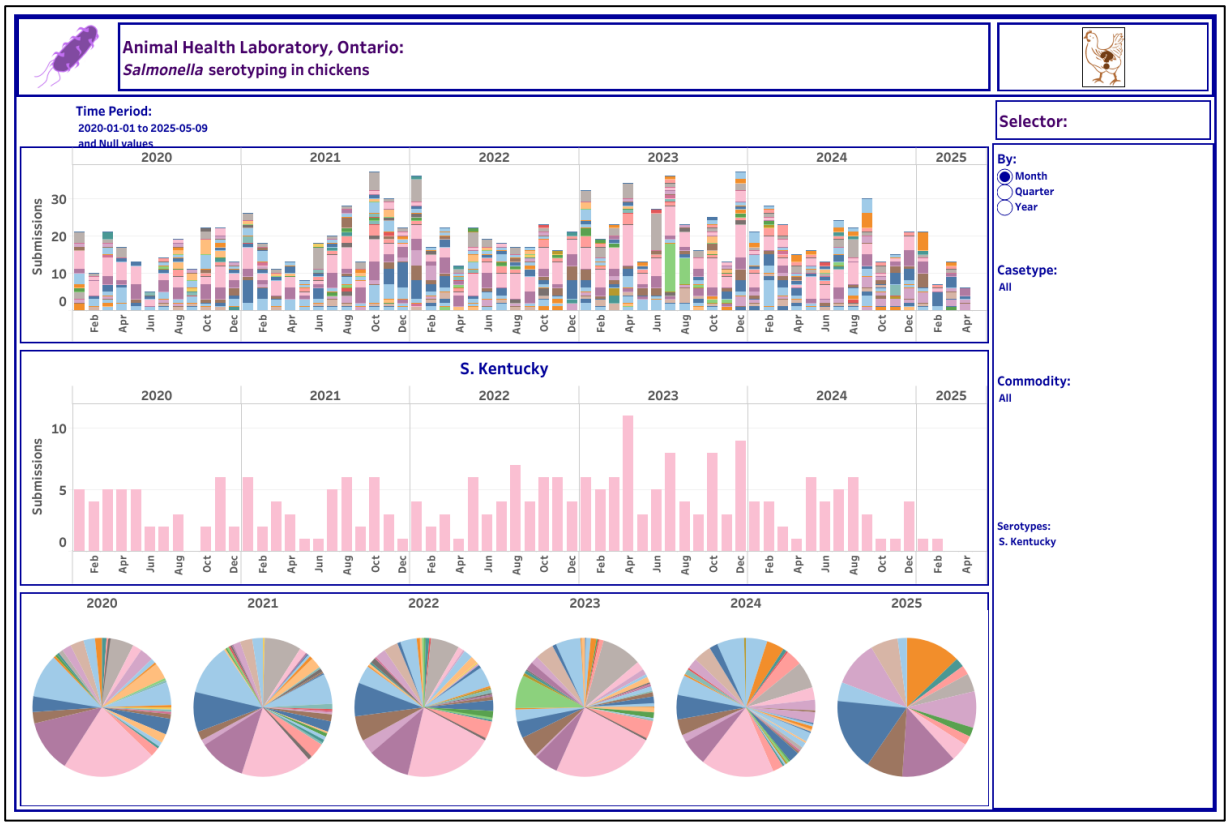

Figure 2: The Animal Health Laboratory's interactive animal pathogen dashboard for poultry *Salmonella* species isolated from clinical and environmental Ontario Hatchery and Supply Flock program samples from 01-01-2020 to 09-05-2025. Research samples were excluded.

Cutaneous myxosporidiosis in wild creek chub

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During routine fish health and environmental monitoring of a localized water body in a semi-urban conservation area in Southwestern Ontario, it was noted that some retrieved wild creek chub (*Semotilus atromaculatus*) fish had abnormal external appearances and deformities. Fish were routinely retrieved using standardized electrofishing stunning techniques; a single abnormal-appearing fish was humanely euthanized for further analysis. After opening of the coelomic cavity to allow for adequate fixative penetration, the affected fish was placed whole into 95% ethanol for preservation and then submitted to the Animal Health Laboratory for further gross and histological analyses.

On external examination, the fish contained numerous individual to coalescing, firm, white-tan expansile nodules that protruded above the external skin surface. Nodules were most prominent and numerous along the dorsal, lateral, and ventral surfaces of the head, and rostral trunk/abdomen (**Fig. 1)**. These nodules compressed and distorted the local soft tissues, and occasionally resulted in mild displacement or compression of regional structures such as the eye, operculum and branchial cavity. Other than these nodules, the fish was in good body condition with adequate coelomic fat stores and no other internal abnormalities.

The fish was 5-6 cm in length, and was subsequently demineralized and softened by submersion of the whole fish in slow decalcifying solution for 48 hours prior to trimming. Serial cross or longitudinal sections of the head and body with organs *in situ* were then routinely trimmed into cassettes for processing and generation of routine H&E-stained histological sections.

Numerous individual and clustered, well-demarcated 1.0 mm - 3.2 mm diameter round to short oval myxosporean cysts (**Fig. 2A**) were scattered throughout the interstitium of the perivertebral and pericerebral skeletal muscle bundles. These cysts often displaced and compressed the adjacent myofiber bundles, in addition to occasional adjacent parenchymal organs (e.g. trunk kidney). Cysts contained an outer 30 µm-75 µm thick fibrous wall that was internally lined by a single layer of macrophages and rimmed by necrotic cellular debris. The centre was filled by abundant, loose to moderately densely packed myxozoan spores, measuring 9 µm-12 µm long and 4.0 µm-5.5 µm wide (**Fig. 2B**). Spores contained an outer indistinct thin hyalinized wall, with single central round pale basophilic nucleus. Special-stained sections (B&H Gram and Giemsa) highlight the spore morphology; spores ranged from fusiform to pyriform with paired polar capsules and central basophilic nuclei (**Figs. 2C, 2D**). Apart from regions of overlying epidermal ulceration and intervening peripheral fibrous encapsulation, there was no obvious host-associated inflammatory reaction.

These findings are consistent with a disseminated myxosporean parasitic infection and a diagnosis of myxosporidiosis. Myxosporean parasites are fairly common in wild fish and most infections are well adapted to their host, causing minimal morbidity. However, aberrant host infections can result in a much more robust inflammatory response. Apart from fibrous encapsulation and regions of pressure-induced skin ulceration, the current case did not contain any obvious targeted inflammatory response, and therefore, a host-adapted infection is suspected in this case. Because myxosporeans have a life cycle that requires at least two distinct hosts, they are a threat to cohabitating fish only if the intermediate host is present in their system.

Various species of myxosporean parasites have been described in creek chub; however, these reported infections were restricted to the urinary system, gall bladder, or gills (e.g. *Myxobilatus semotilii, Myxobolus muelleri, Myxobolus pellicides, Myxobolus pendula, Sphaerospora paulini*, and *Chloromyxum catostomi*). The presence of two paired polar capsules is considered characteristic for myxosporean parasites belonging to the *Myxobolus* genus and the inter/intra-muscular location would also be consistent with a *Myxobolus* species. Further species identification would require molecular sequencing which was not performed in this case.

Although parasitic infections such as this are often disfiguring, they rarely cause significant morbidity. Parasite numbers in this case were quite numerous, but other than impingement or compression of the vertebral column and associated structures, the clinical significance and risk to cohabitating fish in this water body is probably minimal. Histological evaluation however plays an important role in differentiating incidental host-adapted infections from other disease conditions that could have more important implications for population health.

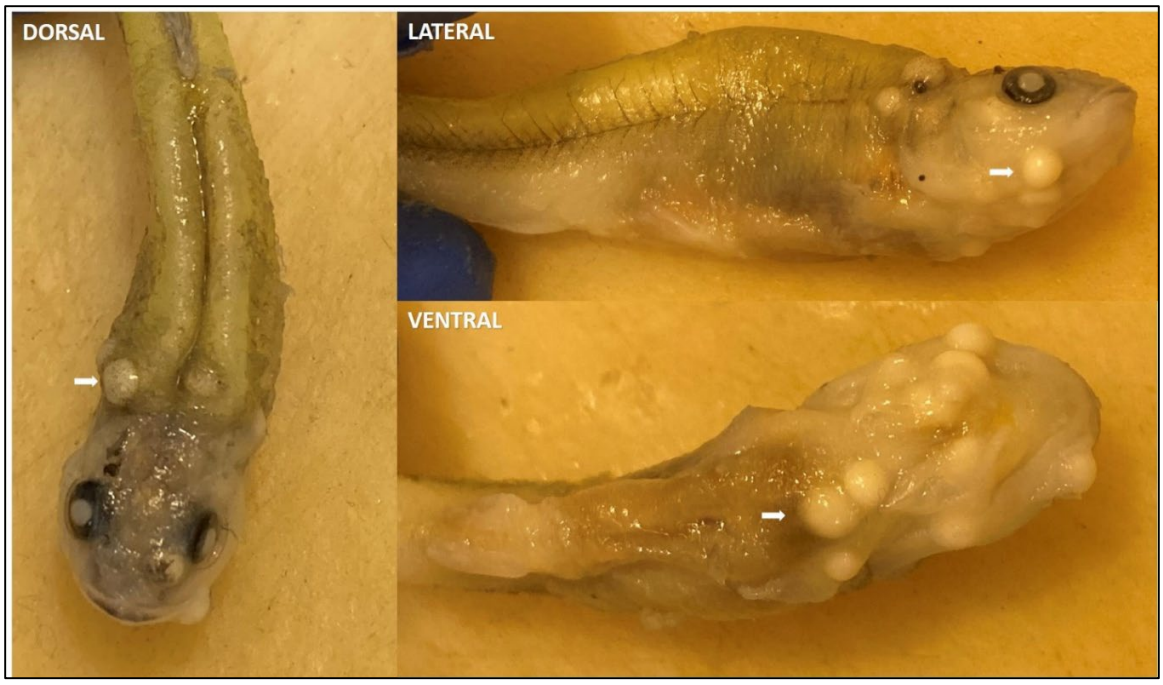
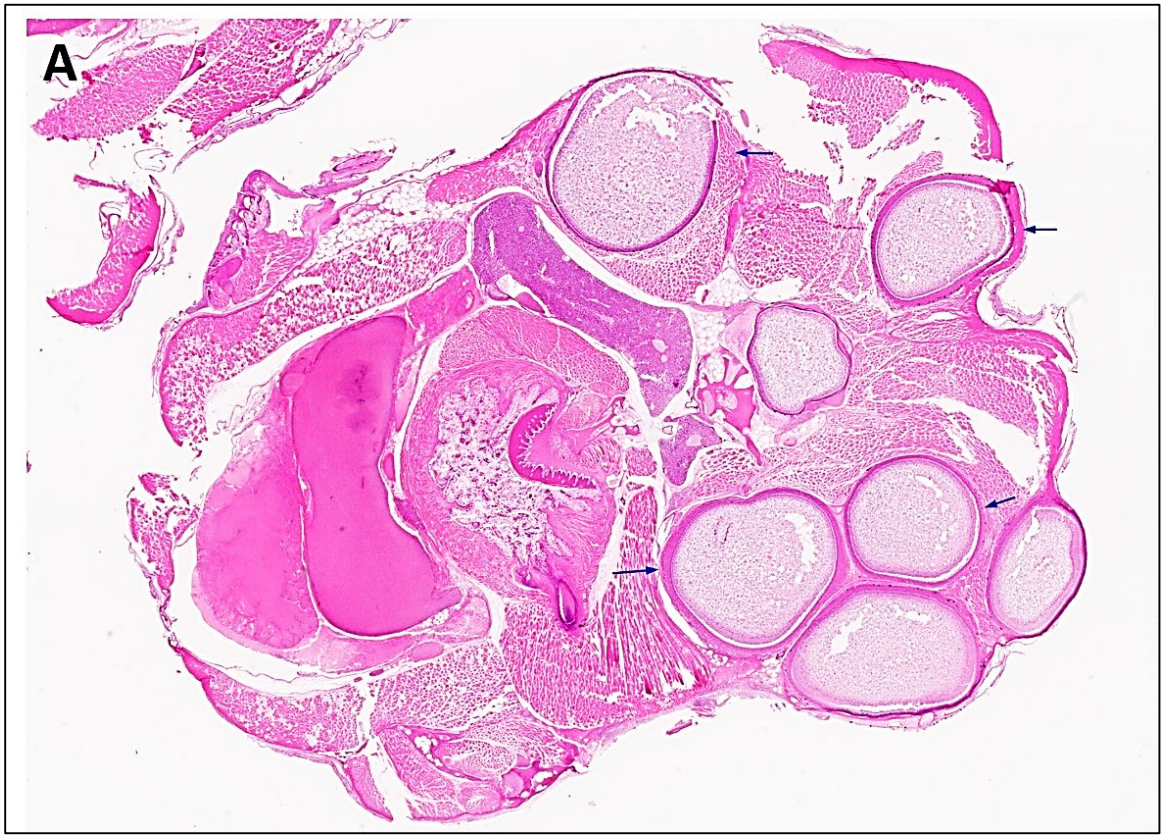
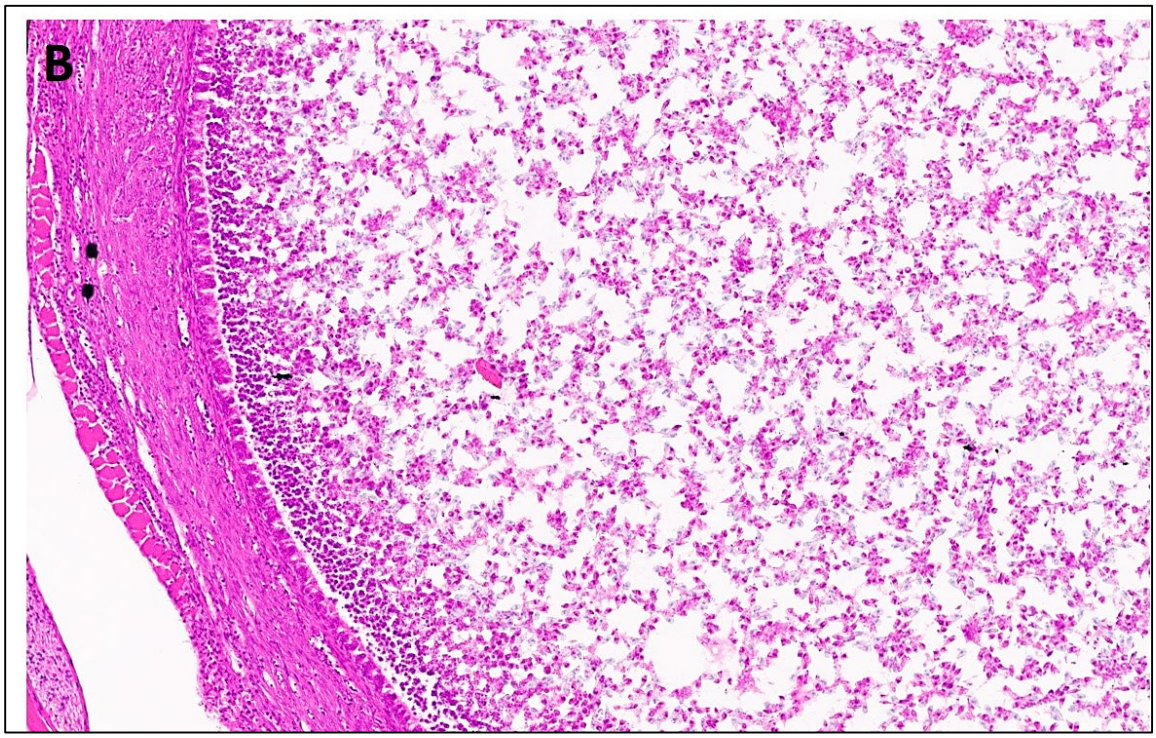


Figure 1. Postmortem findings in a wild caught creek chub with cutaneous myxosporidiosis. There are multiple firm, white-tan expansile cutaneous nodules scattered along the dorsal, lateral, and ventral surfaces of the head and rostral trunk/abdomen.

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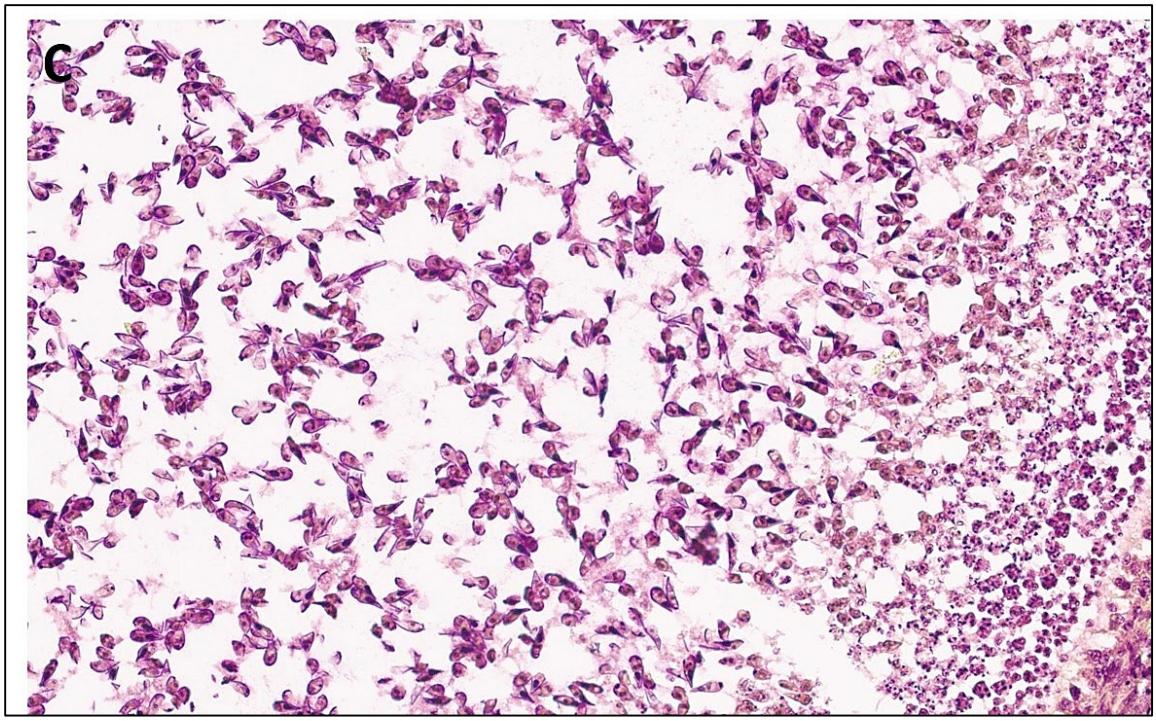
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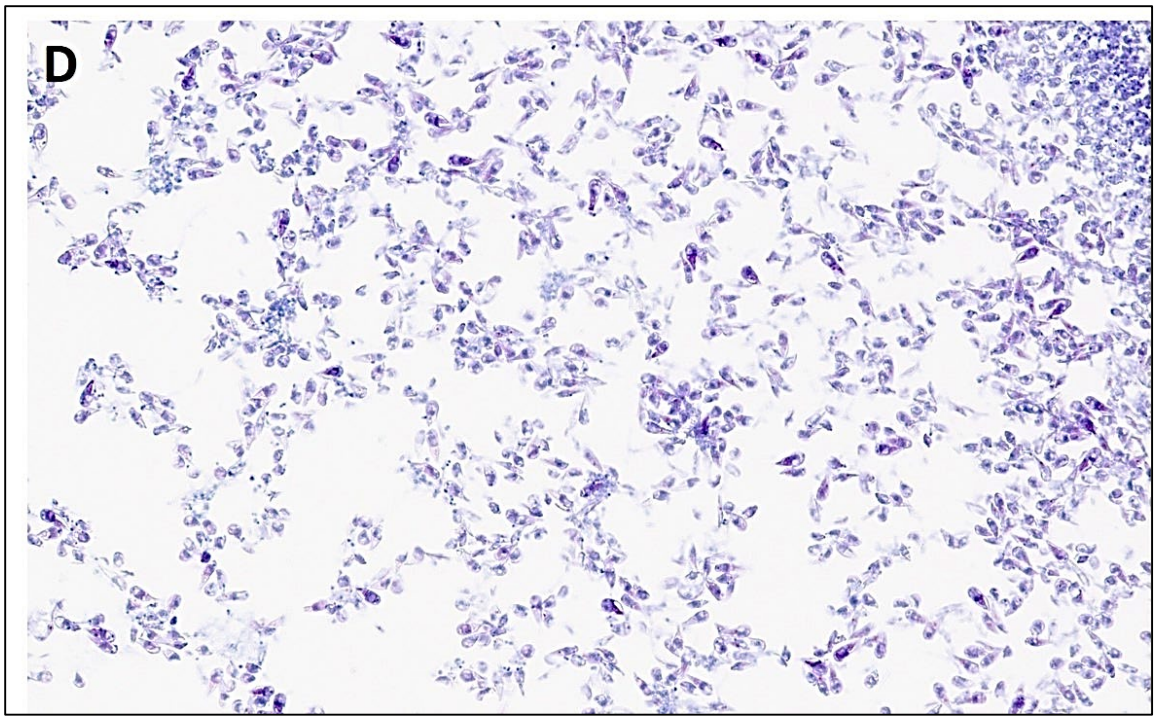

Figure 2. Histological findings in a wild caught creek chub with cutaneous myxosporidiosis. **A.** Head. There are numerous individual or often clustered, well-demarcated, round to oval myxosporean cysts. (arrows). H&E stain. **B.** Myxosporean cyst. Higher magnification of cyst wall and spores. H&E stain. **C & D**. B&H Gram and Giemsa stain respectively. Special-stained sections highlight the spore morphology, ranging from fusiform to pyriform with paired polar capsules and central basophilic nuclei.

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‘Tis the season for migrating foreign bodies

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With the warm weather approaching, disease caused by migration of penetrating environmental foreign bodies is expected to be on the rise. Season, geographic location (rural vs. urban) and even the density of an animal’s haircoat are all potential risk factors for foreign body penetration and migration. The warmer months are thought to be of the highest risk for plant material foreign bodies (grass awns), but chronic migration and delayed disease can happen at any time of the year.

Over several years at AHL, memorable cases caused by foreign body migration include a range of objects such as grass awns or other plant material (**Figs. 1,4**), toothpicks (**Fig. 2b**), porcupine quills (**Fig. 3**), and even BBQ brush metal bristles.

Initial differential diagnoses, clinical histories and chronicity of disease for these cases were highly varied. Clinical signs and speed of onset can depend on the final location of the material and the type of inflammation. The inflammatory response can be sterile - centered only on the foreign body – however, plant or other foreign material can often implant bacterial or fungal microorganisms within migration tracts, leading to a more widespread or septic inflammatory reaction.

Plant material and natural environmental debris have a propensity to lodge in interdigital spaces, ears, eyes, and oral/pharyngeal/nasal cavities. Following implantation, foreign material will follow the path of least resistance and migrate in a unidirectional path through tissues, ultimately lodging, sequestering, and triggering an inflammatory response. Clinical signs vary greatly depending on the primary site of implantation and the path of migration, but typically include swellings/masses of the skin and deeper soft tissues of the ear canal, head, face, neck, thorax, flank, and interdigital areas. Conjunctiva, oral, and nasal mucosal membranes may also be affected. Distant migration through the body has been reported to cause pyothorax (**Fig. 1**), spinal empyema, and even brain abscessation.

Diagnosis of disease resulting from plant material/foreign body migration can be challenging. Microscopically, polarized light can aid in the detection of inconspicuous foreign plant material by producing a refractile glow (**Fig. 4c**). Ultrasound (**Fig. 2a**), radiographs or other imaging may be helpful in some cases with larger fragments or radiodense material; however, foreign material is most often found during surgery, biopsy (histologic examination), or at postmortem.

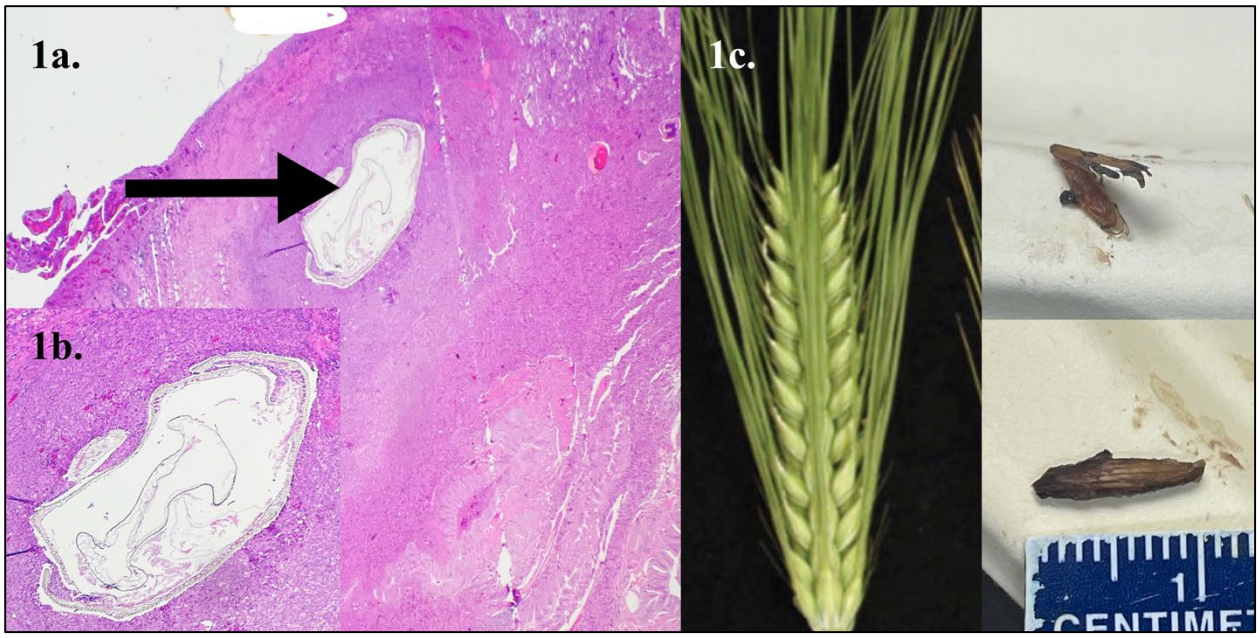
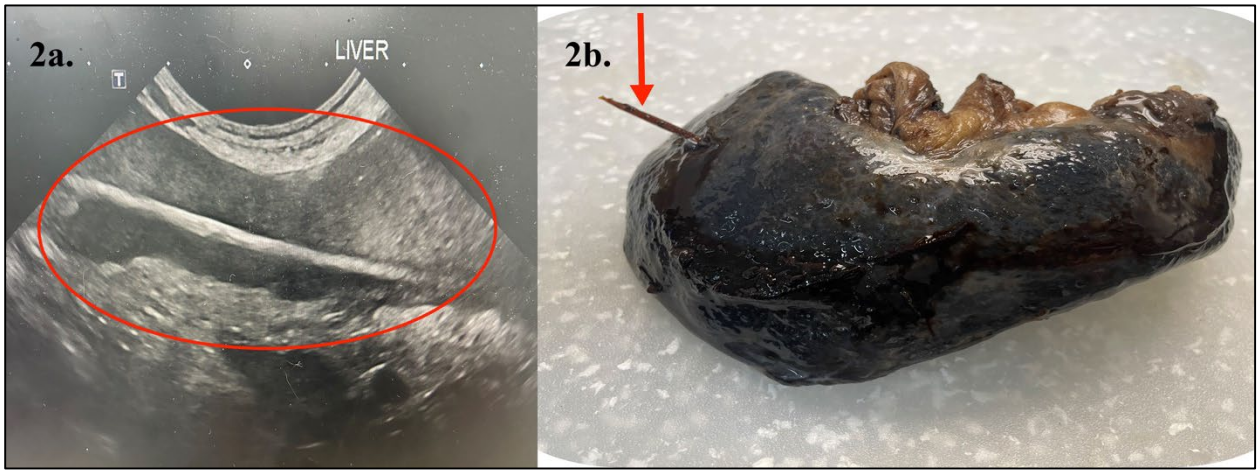


Figure 1. Lung/mediastinum/pericardial histopathology submission from a 2-year-old English springer spaniel hunting dog with a clinical history of lethargy, anorexia, pyrexia, dyspnea, pleural effusion, bronchopneumonia and draining tracts in the chest wall. **1a.** Lung section with suppurative pleuritis and pyogranulomatous inflammation centered on foreign material (black arrow), consistent with plant fragments (H&E, 4x). **1b.** Closer view of the entrapped plant material (H&E, 20x). **1c.** Comparison of foxtail plant (grass awn) with plant material retrieved from the formalin-fixed section of lung submitted for histopathology.



2. Pathology submission of a spleen from a 12-year-old pug with a history of lethargy, decreased appetite, vomiting, "hunched" posture, and pyrexia**. 2a.** Ultrasound detection of a foreign body (red circle) embedded in a thrombosed spleen. **2b.** Gross view of the formalin-fixed spleen and the migrating foreign body (toothpick - red arrow) presumed to have been ingested with subsequent migration through the stomach wall into the spleen.

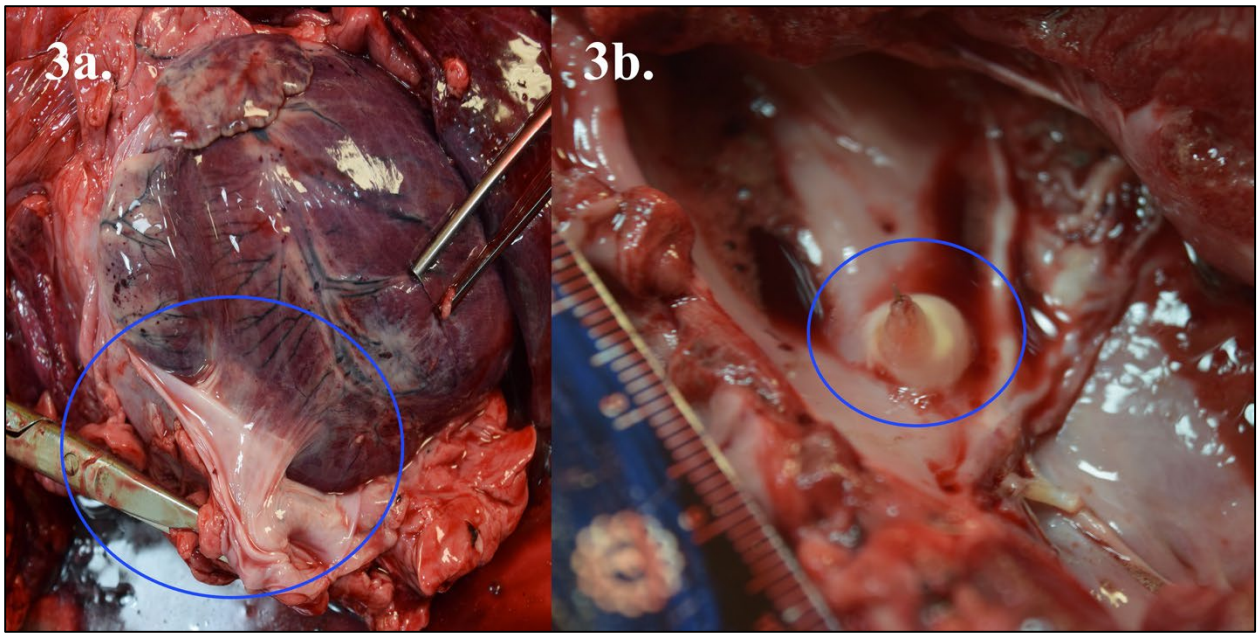


Figure 3. Postmortem of a 17-month-old black bear cub that entered a sanctuary 6 months prior to submission with a history of being quilled by a porcupine. The cub suffered acute death during activity. **3a.** A focal region of chronic fibrous pericardial adhesion to the epicardial surface of the heart (blue circle) indicating a possible migration tract. **3b.** A migrating porcupine quill (blue circle) penetrating through the left atrium/aortic valve surrounded by a rim of fibrosis. Photo credit to Dr. Rebecca Egan.

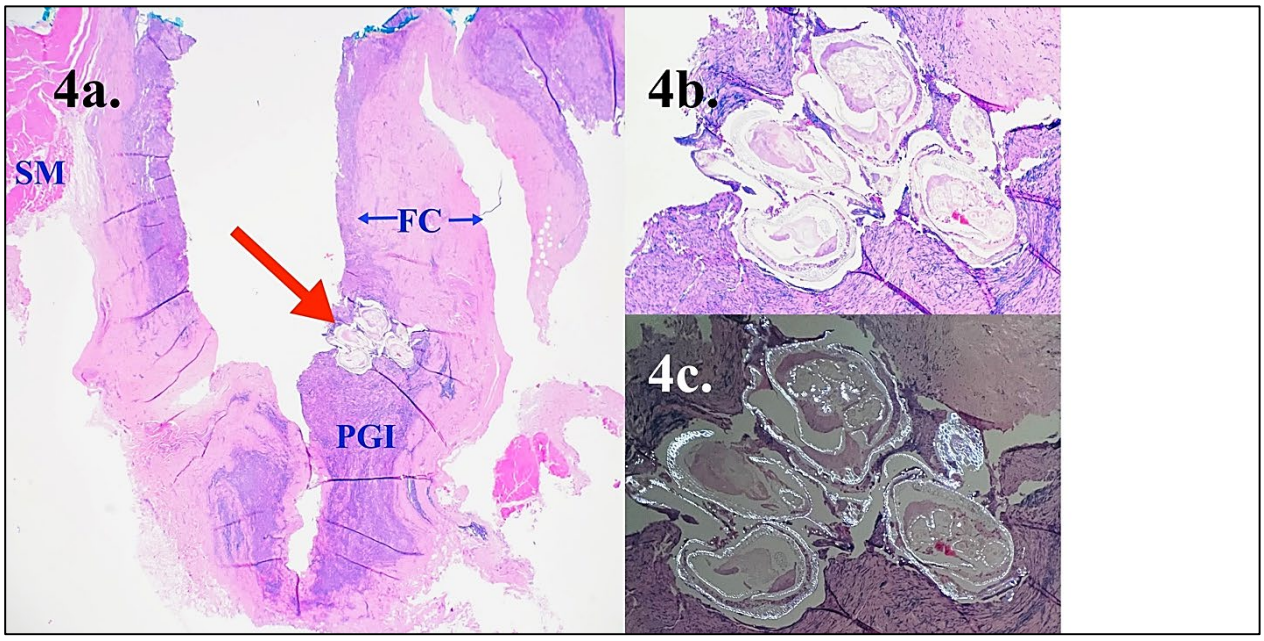


Figure 4. Histopathology submission of tissue from an 8-year-old whippet with a 2-month history of an expansile submandibular mass. **4a.** Subcutaneous tissue from the submandibular region containing a central aggregate of plant material (presumed foxtail/grass awn) surrounded by pyogranulomatous

inflammation (PGI) and an outer fibrous capsule (FC); skeletal muscle (SM). (H&E 4x). **4b.** A closer view of the embedded plant material (H&E 20x). **4c.** Refractile plant material under polarized light (H&E 20x).

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Feline restrictive cardiomyopathy

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A 5-year-old Siberian cat initially presented with an acute episode of ataxia, but MRI imaging and cerebrospinal fluid analysis were unremarkable. Clinical signs progressed to lethargy and laboured breathing, followed by cardiac arrest. At postmortem, there was cardiomegaly and enlargement of the left auricle. The muscular wall of the left ventricle was not grossly hypertrophied. Histopathology revealed pulmonary edema, and in the left cardiac ventricle, the endocardium was markedly expanded by mature fibrous tissue with adherent fibrin (**Fig. 1**). There was also extensive replacement fibrosis of the myocardium. These cardiac lesions are typical of restrictive cardiomyopathy (RCM). It was considered that the episode of ataxia may have been secondary to either thromboembolism, or reduced cardiac output.

Feline hypertrophic cardiomyopathy (HCM) is a top differential for feline sudden death, while RCM is a less common postmortem finding. The cause of death in animals with RCM is left-sided heart failure, or fatal arrhythmia secondary to dysfunction of the cardiac conduction system if there is extensive involvement of the myocardium. There are subtypes of RCM which vary by gross appearance and nature of histologic lesions, but all involve fibrosis of the left ventricle. These subtypes include: endomyocardial fibrosis, myocardial fibrosis, endomyocarditis/endocardial fibrosis and endocardial fibroelastosis.

The cause of RCM is undetermined. Some cases have been reported secondary to *Bartonella* induced myocarditis, but RCM is also considered to be heritable to some degree, similar to HCM in Maine coon and ragdoll cats. As yet, a specific mutation for RCM has not been identified, and it is unclear whether Siberian cats may be genetically predisposed to the development of RCM.

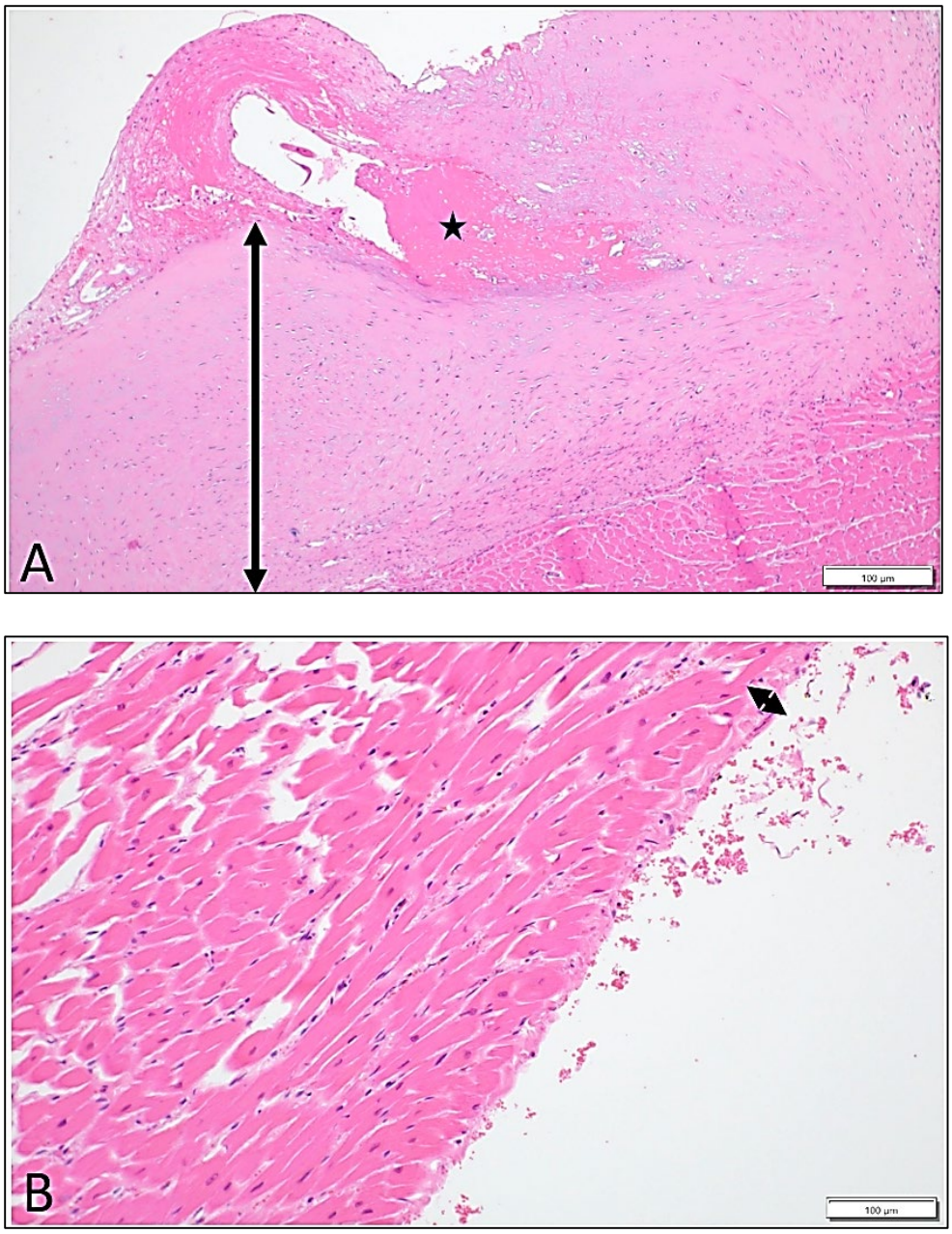

Figure 1. Feline, heart. **A**: The endocardium of the left ventricle (arrow) is markedly expanded by mature fibrous tissue, and there is adherent fibrin (star). **B:** The thickness of the endocardium of the right ventricle (arrowheads) from the same cat. H&E stain.

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