Animal Health Monitor



August, 2024

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Volume 17 Issue 1

DIRECTOR'S MESSAGE

Welcome to the first issue of the Animal Health Monitor in 2024!

This issue covers a variety of topics including programs and new staff in the Office of the Chief Veterinarian, new managers in the Plant and Animal Health Branch, and articles by two of the Animal Health Centre (AHC) Veterinary Pathologists. As well, our facility is now fully re-opened after the November 2021 atmospheric river flooding event! Information about resuming our electron microscopy services is presented on page 8.

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Notices, Acknowledgements

I must acknowledge the highly pathogenic avian influenza outbreak that the province of British Columbia (B.C.) has endured for quite some time now. While the situation is quiet during this summer of 2024, the avian influenza outbreak in the Fraser Valley that started on October 20, 2023 caused challenges in laboratory operations until March 2024, as we redirected many of our staff and resources to the outbreak response. As a member of the Canadian Animal Health Surveillance Network (CAHSN), the AHC supported the Canadian Food Inspection Agency (CFIA) response by providing timely laboratory testing services to facilitate the movement of poultry and poultry related products in the control zones. About 25 staff from the AHC were directly involved with the outbreak response and they have done an incredible job in supporting the efforts of the Province, CFIA and the industry by working longer hours and on the weekends and holidays. Despite the challenges posed by the avian influenza outbreak in the Fraser Valley and other emergencies, we were able to resume nearly all lab services by the end of 2023 and purchase new equipment including an electron microscope in early 2024.

The Plant and Animal Health Branch (PAHB) has been taking proactive steps to (1) increase capacity, and (2) expand services to include genomics tools. Automation is underway of two key workflows that support the avian influenza and other disease outbreak testing, including nucleic acid extraction and PCR tests. In an effort to support enhanced disease diagnosis and problem solving, methods are being developed to offer partial and whole genome sequencing services to clients. Similar to other veterinary diagnostic laboratories that have expanded into this area, we are developing genomics services so that the AHC can provide modern sequencing information to support disease mitigation efforts. In the coming year, we plan to offer webinars and other events to share the news on genomics services and capabilities within the AHC.

During this year, the AHC also completed two external audits as part of the Standards Council of Canada (SCC) (to the ISO/IEC 17025 standard) and American Association of Veterinary Laboratory Diagnosticians (AAVLD) accreditations. The AHC and PAHB staff and management team value the opportunity to engage with accreditation bodies - the continuous improvement cycle is for the benefit of everyone, clients and staff alike. A small group of clients participated in a lunch engagement session with the AAVLD site visit team - thank you to all who participated and contributed their feedback! The SCC will return again in 2026 as a part of the biennial accreditation cycle, while we can look forward to having an AAVLD site visit next in 2029. The AHC is deeply committed to continuous improvements to our services and meeting the needs of our clients. That is one of the reasons for the client survey distributed earlier this year. Thank you to those who participated in the client survey. Your insights and recommendations are invaluable for us to improve our services.

We will continue to assist you by providing important information on animal disease concerns and diagnostic solutions through our newsletters, email updates and consultation services. Please contact us by phone 604-556-3003 or email pahb@gov.bc.ca, or visit our website at www.gov.bc.ca/animalhealthcentre for more information. We hope our newsletters will keep you informed and help you stay connected to us.

- Dr. Tomy Joseph, Director of the Animal Health Centre

Animal Health Centre

Hours of Operation:

1767 Angus Campbell Road Abbotsford, B.C. V3G 2M3

Monday to Friday, 8:30 AM to 4:30 PM

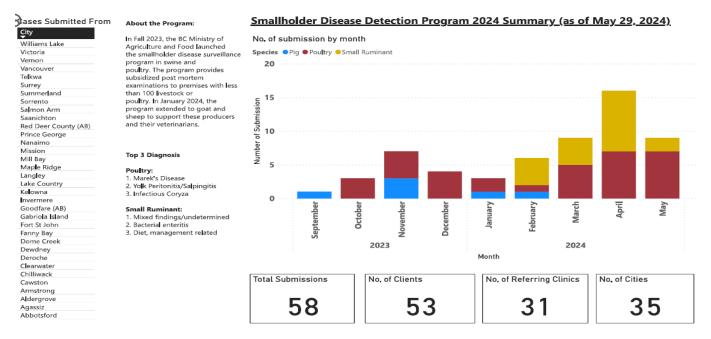
Phone: 604-556-3003 Toll free: 1-800-661-9903 Fax: 604-556-3010 Email: PAHB@gov.bc.ca



Office of the Chief Veterinarian

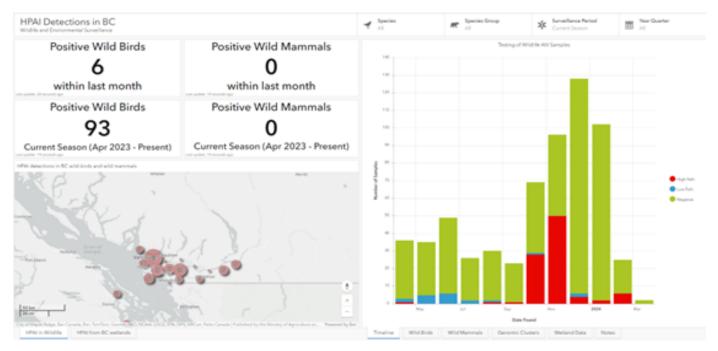
The Smallholder Disease Detection Program Update:

As of March 1, 2024, the Plant and Animal Health Center received 23 cases from 20 cities and 16 clinics across the province through the Smallholder Disease Detection Program, launched in Fall 2023. This program offers subsidized postmortem examinations to premises with fewer than 100 livestock or poultry to support these producers and their veterinarians while monitoring for reportable and notifiable diseases in smallholder herds and flocks. For more information about the program, please visit: https://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/animals-and-crops/animal-health/office-of-the-chief-veterinarian/26527#surveillance.



The B.C. Wildlife HPAI Dashboard

Over the last few years, the poultry industry has been impacted by highly pathogenic avian influenza (HPAI) outbreaks. The B.C. Wildlife and Environment Surveillance Dashboard is available to the public and shows where HPAI is detected in wild birds and sediments in the province, which can help producers and other stakeholders to make appropriate preventative measures. The dashboard is available at: https://governmentofbc.maps.arcgis.com/apps/dashboards/8c6c84718e5748179102a0be2368029a



Office of the Chief Veterinarian cont'd

Introducing New Team Members

The Office of the Chief Veterinarian (OCV) is a branch within the B.C. Ministry of Agriculture and Food and has a key role in addressing animal health, regulated animal and zoonotic diseases, One Health, and One Welfare in B.C. The OCV has a small core staff that is led by Dr. Theresa Burns (Chief Veterinarian). We are delighted to welcome three new team members who joined OCV in 2023/2024:

Dr. Michelle Coombe Veterinary Epidemiologist

Michelle has been involved with the Ministry of Agriculture and Food since 2015 and recently joined the OCV. She earned her PhD at the School of Population and Health at the University of B.C.



in 2023. Her research focused on environmental sampling for the surveillance of avian influenza viruses in wild waterfowl. Michelle also has a degree in Ecology from the University of Calgary and obtained her veterinary degree from the Western College of Veterinary Medicine. Her passion for wildlife and epidemiology is a huge asset to the OCV team. In her free time, Michelle enjoys hiking, skiing, and climbing in the picturesque surroundings of the Coast Mountains.

Dr. Gigi Lin Animal Welfare, Extension, & Emergency Management Veterinarian

Gigi provides leadership in the specialized field of animal welfare, animal health extension, including welfare management in

emergency responses. Gigi obtained her veterinary degree from the Western College of Veterinary Medicine, and is board certified by the American College of Poultry Veterinarians. Gigi also has a degree in Agroecology from the University of B.C. Before joining the OCV, Gigi spent 7 years working as a private poultry veterinarian, providing diagnostic, consultation, teaching, and field services to all levels of the commercial poultry industry and small flocks in Western Canada. She is passionate about helping and working in animal agriculture in B.C. She particularly enjoys disease investigations and creating continuing education opportunities for livestock and poultry producers.

Dr. Wali Sahar Dairy Inspector

Wali was raised in Afghanistan and obtained his bachelor's degree in animal science from Kabul University. He moved to the USA and completed a master's in dairy nutrition. In 2017, Wali moved to Canada and began his career as a



research assistant with the Animal Welfare Program at the University of British Columbia, and completed his PhD under the same program in 2023. During his doctoral program, Wali conducted research on transition period disease and lameness in dairy cattle. By analyzing cattle behaviors, he developed predictive models to help identify cattle at high risk of becoming sick or lame. His experience in cattle behavior greatly contributes to his role as a dairy inspector. In his free time, Wali enjoys spending time in nature, hiking, and playing soccer with his family.

OCV 2023 Highlights

In 2023, the OCV team continued to actively engage in diverse initiatives to build resilient animal health systems and to lead progress on One Health and One Welfare initiatives.

Here are a few highlights:

Our work on avian influenza was presented at the Washington State One Health Conference and the 71st Annual international Conference of the Wildlife Disease Association.

The apiary team, led by Paul van Westendorp, delivered the highly popular beekeeping course to over 1,500 participants in two separate learning sessions.

The dairy and surveillance team conducted quarterly bulk milk tank screening for *Salmonella Dublin* on 461 dairy farms across the province.

Two surveys on veterinary access in B.C. were deployed, receiving over 450 responses from producers.

OCV 2024 Highlights

The Veterinary and Veterinary Technologist Students Working in BC Food Animal Practices (VVTS) program is just wrapping up for this year. 17 veterinary clinics and 21 students participated in the program; the clinics received \$6,000 in funding for each student they hosted. The students got some hands-on learning at the clinics as well as attending several virtual learning sessions put on by Ministry of Agriculture and Food staff. The intake for next year will come out early in 2025.

The Veterinary Locum Bank program is a new program that started in August, 2024 – the program is designed to increase the pool of veterinarians and registered veterinary technologists that are available to provide locum services for BC veterinary practices that offer care for food animals, with a priority for servicing practices outside of the lower mainland. This program is funded in part by the Government of Canada under the Sustainable Canadian Agriculture Partnership, a federal-provincial-territorial initiative. More information and the link to the application can be found at https://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/programs/veterinary-and-veterinary-technologists-locums-working-in-bc-food-animal-practices-pilot-program

Plant and Animal Health Branch

Kirsten Tweedhope Section Head, Histology & Post Mortem Room

Kirsten Tweedhope became Section Head of Histology & Post Mortem room, a facilities coordinator, and Assistant to the Biosafety Officer in January of 2023. She joined the Ministry of Agriculture and Food in early 2020



as a Post Mortem room technician then Head Technician. Kirsten has a Bachelor of Science degree and a Veterinary Technologist Diploma from Thompson Rivers University in Kamloops, B.C.

Prior to joining the Plant and Animal Health team, Kirsten worked in private small animal practice in several locations in the Lower Mainland and Interior for the past 14 years. She has a special interest in shelter medicine and assisting with shelter spay/neuter clinics. She also worked on developing and implementing the ringworm surveillance program for shelter animals obtained in seizures during her work at the B.C. Society for the Prevention of Cruelty to Animals (SPCA) Animal Hospital.

Dr. Heather Osachoff Director, Laboratory Operations

Dr. Osachoff joined the Ministry of Agriculture and Food on March 1, 2023 as the Deputy Director to the Director of the Animal Health Centre. Then on January 1, 2024, she started in the position of Director of Laboratory Operations



for the Laboratory Operations and Quality Assurance Unit. This role involves supporting the plant and animal health labs with facility operations, new initiatives, policy development, biosafety, and quality assurance. Dr. Osachoff has a Bachelor of Science degree from the University of Victoria and a Master of Science and PhD in Biology from Simon Fraser University.

Dr. Osachoff has worked in six different chemistry, microbiology, biochemistry and toxicology laboratories. From 2001-2013, she developed PCR and genomics methods at the Pacific and Yukon Laboratory for Environmental Testing, an Environment and Climate Change Canada facility. Prior to joining the PAHB she worked in the contaminated sites program in the B.C. Ministry of Environment and Climate Change Strategy from 2013-2023 in several positions, including: Sr. Risk Assessment Officer, Head of Science and Standards, and Manager of Risk Assessment and Remediation. That work included being a statutory decision maker for the province on the remediation of B.C. contaminated sites.

Dr. Eduardo Leite Director, Business Operations

Dr. Leite joined the Ministry of Agriculture and Food in December 2022 as Director of Business Operations. He holds a Bachelor of Science degree in Veterinary Medicine and a Master's in Business Administration, with over ten years of experience overseeing and leading multi-unit retail operations, multi-disciplinary teams, multi-faceted



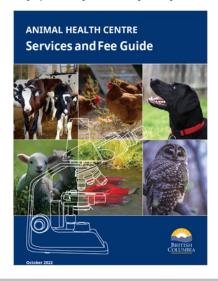
projects and programs, as well as operational leadership and process improvement in the private sector.

Eduardo completed his veterinary training at the Federal University of Goiás (UFG) in Brazil. During his years at UFG, he assisted in the Animal Reproduction Laboratory, participating in research programs in in-vitro fertilization and embryo transfer, pathophysiology, reproductive and metabolic diseases, and reproductive efficiency in dairy cattle and sheep. He was also a member of the Center for Studies and Research in Animal Reproductive Biology in the Veterinary Medicine Department at UFG, collaborating with researchers in cattle farming, reproductive endocrinology and biotechnologies, uterine health, thermal stress in cattle, and microbiology.

Animal Health Centre Services and Fee Guide

For more information on available services and fees, see the latest Animal Health Centre Services and Fee Guide.

This guide contains detailed information on sample collection, submission requirements, packing and shipping, fees for services, payment options, helpful tips and more.



An Unusual Mortality Event of Eastern North Pacific Gray Whales

Due to the unique coastline, topography, oceanography and regional productivity, British Columbia (B.C) has among the most diverse marine mammal communities in the world. There are species of marine mammals that reside throughout the year in B.C. waters and others that transit seasonally along the coast. Among those species that frequent the coast on a seasonal basis, gray whales have the longest migrations of any marine mammal in the world. Their range extents between summer feeding grounds in the Bering Strait and Chukchi Sea in Alaska to calving lagoons along the Baja Coast of Mexico. In B.C., these animals are typically observed along the west coast of Vancouver Island during their southern migration in the fall and northern migration in the spring. Ongoing efforts have recorded census data of these animals in California and Mexico from the mid 1990's through to 2023. Between 2019 and 2023, increased numbers of gray whale strandings were reported throughout their migratory range and between 2019 and 2022, the population of gray whales declined from 28,000 to 14,500. During this time, there were 690 gray whale strandings reported by the public, regional stranding response networks, First Nations Communities, fisheries officers, research scientists and biologists to regional and local stranding response networks. Due to the increased number of stranded animals, an Unusual Mortality Event (UME) was declared by the National Marine Mammal Response Program, National Oceanic and Atmospheric Administration. Therefore, a more coordinated and standardized response and post mortem examination with data sharing was established between Mexico, the United States and Canada. Of the 690 beach cast or dead and floating animals (Figure 1), post mortem examinations were conducted on 61 animals. There were 16 whales that presented with severe emaciation or starvation, 11 whales with evidence of vessel strike, 3 whales with evidence of killer whale attack (2 probable and 1 suspect), 2 whales were entangled in fishing gear and 1 whale had lesions consistent with entrapment. In addition to the mortalities, the calf crop declined from an estimated 380 in 2019 to 217 neonates in 2022, which were considered among the lowest recorded numbers since 1994. The geographical distribution of

stranded whales is in Figure 2 (next page).

The cause of the grey whale population decline was considered multifactorial and included emaciation/starvation, likely related to climate change in the over summer feeding grounds in the North Bering and Chukchi Seas that resulted in lower productivity of benthic prey and reduced access to feeding grounds due to ice, killer whale predation and vessel strike. Suboptimal body condition of the adult females may have resulted in reduced reproductive success, early embryonic loss or production of nonviable neonates. Efforts are ongoing to monitor post UME mortalities.



Figure 1:

Pictures demonstrate some of the challenges with recovery and post mortem examination of stranded grey whales.







Article Contributors:

Stephen Raverty¹, Paul Cottrell², Brendan Cottrell² and Taylor Lehnhart²

- ¹ Animal Health Center, Abbotsford, B.C.
- ² Department of Fisheries and Oceans, Vancouver, B.C.

An Unusual Mortality Event of Eastern North Pacific Gray Whales cont'd

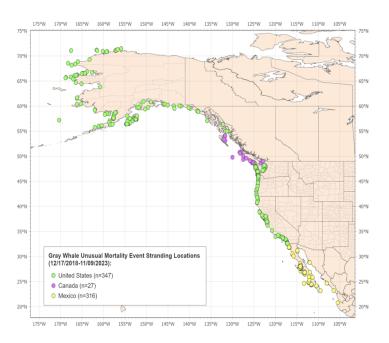


Figure 2. Distribution of gray whale strandings between 2019 and 2023 along the west coast of Mexico, the United States and Canada.

<u>Maximizing the Value of a Necropsy Post Mortem</u> <u>Diagnostic Package</u>

Dr. Ann Britton, Veterinary Pathologist

Death of an animal is a stressful event for animal owners, caregivers and managers. Determining the cause of death is an important step in preventing further losses in cases of infectious disease, toxicity, etc. The AHC provides full post mortem (PM) service for mammals, avian and fish species conducted by veterinary specialists (pathologists), formally trained for this purpose. The veterinary pathologists are supported by a team of technicians and scientists in making the diagnosis by conducting ancillary tests. Depending on the details of each specific case, a definitive diagnosis may or may not be established, that is the nature of the business. However, when a definitive diagnosis cannot be established, the submitter will be informed as to what was not the cause of death and this is also important information.

In an ideal world, every animal owner who desires a PM would have that done at the AHC. However, an owner cannot always get their animal to the AHC. In this case, an on farm PM conducted by a veterinary practitioner is a good substitute. The veterinary practitioner will conduct the gross part of the PM: visual examination of the body and the internal organs.

While examining the organs, the practitioner can take all the same samples that our team at the AHC would take. Packaging up the samples and submitting to the AHC with a clinical history and description of the gross PM findings completes the process. The PM can then proceed to completion at the AHC. This submission is called a Necropsy Post Mortem Diagnostic Package.

With just a little bit of preparation and know how, you can maximize the value of the diagnostic package by providing a complete suite of samples for testing. These samples are as follows: Fixed in formalin – lung, heart, liver, spleen, kidney, stomach, at least 4 levels of intestine (jejunum, ileum, cecum, colon) and any other unusual finding. Fresh tissue in first plastic bag (or better – separate bags): large samples of lung, liver, spleen, kidney; and in the second plastic bag: small and large intestine. Submitting this number of samples does not increase the cost of the package but will increase the likelihood that the pathologist can arrive at a definitive diagnosis.

The AHC has a PowerPoint presentation which details the step by step gross PM process for an on farm PM. This presentation is entitled DIY Post Mortem Technique for Cattlemen - but the technique can be easily adapted to any species. You can view this presentation at:

 $\frac{https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/agriculture-and-seafood/animal-and-crops/a n i m a l - h e a l t h / ahc post mortem technique for cattlemen november 201 5.pdf$

The presentation is detailed and was created to help producers in remote areas of the province who do not have immediate access to a veterinary practitioner.

If you are doing an on farm PM and you do not have time to read through the entire presentation, the most important information is the selection of samples the pathologist needs to make a full determination for cause of death (see the list above and below in this article).

If questions or concerns should arise before, after or while doing an on farm PM, don't hesitate to call us 1-800-661-9903 or 604-556-3003 and ask for one of our veterinary pathologists. We are here to help!

Once again, we request the following tissues:

Fixed in formalin – lung, heart, liver, spleen, kidney, stomach, at least 4 levels of intestine (jejunum, ileum, cecum, colon), any other unusual finding. Fresh tissue in first plastic bag (or separate bags): large samples of lung, liver, spleen, kidney; and in the second plastic bag: small and large intestine.

Got A Neurological Case? Don't Forget Rabies

Dr. Ann Britton, Veterinary Pathologist

At the AHC we frequently receive neurological cases for post mortem. Neurological disease workup at post mortem relies heavily on the clinical and vaccine history which accompanies the submission. For the purposes of this article, let's focus on neurological horses. But the same comments apply to all neurological animals submitted to the AHC for post mortem.

Many neurological horses are submitted for ataxia as the major presenting clinical sign. These horses will require removal and examination of the spinal cord, a very big job. If we have neither a history describing clinical signs referrable to the spinal cord nor a specific request from the veterinary practitioner to examine the spinal cord, we will not remove the spinal cord and the diagnosis of a spinal disease will be missed.

Clinical signs referrable to the brain in the submission form will of course lead to examination of the brain and subsequent testing for infectious agents if indicated. Many of the agents which cause encephalitis (inflammation of the brain) and encephalomyelitis (inflammation of the brain and spinal cord) in the horse can be vaccinated for. In B.C., such a vaccination protocol may include EHV, WNV, EEE, WEE and Rabies. Rabies, EEE and WEE are reportable in Canada. So, it is very important for the pathologist to assess the case and determine if a reportable disease may be at play. The most significant of these 3 viral agents with regard to conducting the post mortem is Rabies.

A Rabies suspect will be posted differently than other neurological diseases! This is due to the diagnostic methods needed and the role that CFIA will play in a suspect positive case after completion of the necropsy. Thus, it is critical to know 1) does the horse have clinical signs suggestive of possible Rabies and 2) whether the horse has been adequately vaccinated and can be considered protected. The vaccine is highly effective if used according to recommendations.

Why Rabies you may say. Is Rabies a problem in B.C.? No - if vaccination is up to date. Extremely unlikely - if not protected. But why take the chance? Vaccination is inexpensive and the

infection fatality rate is essentially 100% if unprotected. The Rabies virus reservoir in B.C. is restricted to bats and is estimated to be carried by 0.5% of our provincial bat population. So, 1 in 200 bats is believed to be infected. Bats infected with Rabies will exhibit behavioural changes such as daytime flight, erratic flight and may become aggressive and attack other animals, even if unprovoked. Alternatively, affected bats may exhibit paralysis, incoordination, tremors or convulsions. Bats should never be approached - especially if exhibiting abnormal behaviour. People know that (or should), but animals don't.

Bats spread the Rabies virus present in their saliva by biting. Amazingly, not all human cases of bat variant Rabies have a history of bat exposure. Bat bites are reported to be hard to recognize as the puncture wounds can be small and some humans who contracted bat variant Rabies did not remember a bite or even a scratch. So, you may not notice a bite wound on your horse.

The clinical signs of Rabies are varied, reportedly commencing with vague signs including fever, lethargy, loss of appetite and vomiting. Subsequent neurological signs are broadly divided into two forms: 1) furious or 2) dumb. As the name suggests, the furious form presents as overly aggressive and excitable behaviour which may include biting. The furious form can overlap with some of the dumb form signs. In horses, early signs can present as muzzle tremors, weakness and incoordination of the hindquarters, lameness, recumbency, difficulty swallowing, excessive sensitivity to being touched, reduced sensitivity to pain, loss of tail/anal/urinary bladder tone and somnolence. Survival time after the onset of clinical signs averages 4-5 days.

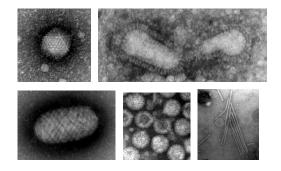
So, even though the risk in B.C. is low, help out your pets by protecting them from Rabies with a vaccination. And help out your local diagnostic laboratory by stating whether or not your animal has been vaccinated for Rabies on the submission form. Armed with the vaccination history, AHC can rapidly determine the level of risk and the proper course of action for any necropsy.

Electron Microscopy in the Plant and Animal Health Centre

The Virology section of the AHC has offered transmission electron microscopy (EM) as a service for over 40 years. With the purchase of a new Hitachi HT7800 TEM, we are excited to announce the resumption of EM services as of August 1, 2024.

Services include:

- Negative Staining for virus diagnostics in animals
- Negative Staining for virus diagnostics in plants



What can be detected?

Viruses of high titre with conserved structure after laboratory treatment with heavy metal stains (phosphotungstic acid or uranyl acetate).

Electron microscopy can detect many viruses, including:

- Rotavirus
- Coronavirus
- Herpesvirus
- Adenovirus
- Influenza virus
- Poxvirus

- Reovirus
- Papillomavirus
- Iridovirus
- Paramyxovirus
- Potexvirus
- Rhabdovirus

... and novel viruses - the discovery of new viruses is possible!

How to submit samples:

Animal - Submit to Virology as normal with "EM" requested.

Plant - Submit tissue to the Plant Health Lab as usual.

Electron microscopes in our facility over time:









2011-2021





2024 - on

What sample types?

- feces, intestine where an enteric virus is suspected
- lesions, skin

<u>Animal</u>:

- tracheal epithelial or tissue impression smears
- fluids from tissue culture & egg inoculation

Plant:

- leaf
- tissue suspected of containing a high titre of virus

How sensitive is EM?

Diagnostic sensitivity varies between tissue type and virus type. Results will be either positive with a virus family identification or "virus not observed". Frequently, molecular methods and virus isolation offer more sensitivity. EM is not able to speciate viruses, but identify the virus family. For example, EM can detect herpesviruses but cannot differentiate between infectious bovine rhinotracheitis virus and bovine herpesvirus type 4. For specific virus testing, please continue to request PCR.

EM is best used to discover new viruses, to confirm presence of virus, to detect virus that is not culturable, or when screening is required to detect all viruses in a sample simultaneously.

Service fees (plus applicable taxes):

In-province client Out-of-province client

Production animals: \$47 \$70.50

\$90 All other animals: \$60

Note: EM may be included at no additional cost at the pathologist's discretion as part of the AHC necropsy package or a Plant Health Lab plant diagnostic package.

Target Turnaround Time: 2 – 10 working days. Plant – as per Plant Health Lab testing guidelines.

Under development: Thin sectioning & ultrastructural pathology for animal and plant tissues. Please stay tuned!



Notices from the Ministry of Agriculture and Food

AgriService BC

The PAHB also provides information on plant health issues via AgriService BC!

AgriService BC serves and supports BC's farm & food sector by providing consistent, accurate and timely communications regarding Ministry of Agriculture and Food programs, resources and events.

Follow AgriService BC on Facebook! https://www.facebook.com/AgriService-BC-103287979487810



Mission Statement of the Animal Health Monitor:

To provide our clients with important information regarding the work being done by the Animal Health Centre and Office of the Chief Veterinarian, as well as events and issues relevant to animal health in B.C.

Acknowledgements

The AHC is located on the traditional territories of the Matsqui and Sumas First Nations. The ministry staff gratefully acknowledge they conduct their work on lands important to Indigenous Peoples, including the Stó:lō, whose relationships with the land continue to this day.

All photos in this newsletter were used with the permission of ministry staff. All content was prepared by ministry staff, unless otherwise indicated.