Animal Health Monitor

Ministry of Agriculture, Food and Fisheries

September, 2021

Volume 14, Issue 1

Mission Statement: To provide our clients with important information regarding the work being done by the Animal Health Centre and Regulatory Unit, as well as events and issues relevant to animal health in BC.

Editorial by Dr. Shauna-Lee Chai,
Acting Executive Director,
Plant and Animal Health Branch

The only constant in life is change.
Heraclitus

As I reflect on the past few months since the last edition of the Animal Health Monitor, there are changes afoot at the Plant and Animal Health Branch that I would like to make you aware of; top of mind for many of us at the Branch is the retirement of our Executive Director – Ursula Viney.

Ursula has been with the Ministry of Agriculture, Food and Fisheries for eight years, working in the Kelowna and Abbotsford offices. Her attention to financial details and process management has benefited our Ministry tremendously. Her leadership at the Animal Health Centre has helped to shift the role and the visibility of the lab to one that contributes more meaningfully to Ministry and provincial priorities. Ursula will be missed. She is retiring from the Ministry to move to Ontario to join her family.

In the 8-month interim, until we recruit a permanent Executive Director, I have been temporarily appointed to the role for a 4-month period: August 30 - December 31, 2021. January 1 – April 30, 2022 will also ring in a new temporary appointment of Shannon Tucker as Executive Director of the Branch.

Despite the changes in leadership, we remain the same great place to diagnose, monitor and manage animal pests and diseases in British Columbia. Last month alone, 2,562 people found the Plant and Animal Health Branch on Google, and we worked through 828 submissions (plants and animals).

My usual role at the Branch is the Director of the Plant Health Unit, where we diagnose, survey and address plant pests and diseases that impact the crop industry. As Acting Executive Director, my vision for the Branch is to maintain eminence in all our specific fields within animal and plant health and to share our science with British Columbians and the world at large.

The COVID-19 pandemic and wildfires here in B.C. have stretched us and taught us the value and possibilities of working collaboratively, across teams and work units. So, wherever you find yourself today, it is my wish that you will work with a mindset of abundance and kindness.

All authors are employees of the Ministry of Agriculture, Food & Fisheries unless otherwise noted.

To subscribe to the Animal Health Monitor, contact: Julie Hughes by "CTRL" clicking mariejulie.hughes@gov.bc.ca

AgriService BC

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Blackhead *(Histomonas meleagridis)* in Turkeys in BC

Doris Leung (Veterinary Specialist), Gigi Lin (Veterinarian – Canadian Poultry Consultants Ltd.), Victoria Bowes (Avian Pathologist), and Tony Redford (Veterinary Pathologist)

Background

Blackhead disease, also known as Histomoniasis, is a parasitic disease of importance caused by the protozoal organism *Histomonas meleagridis*. It affects gallinaceous birds including turkeys, chickens, gamebirds, and peafowl. Blackhead disease may cause high mortality rates in turkey flocks, with variable mortality rates of 10 to 100%. The disease is usually less severe in chickens, with mortality rates of 10 to 20%, but infected flocks may have reduced egg production and poor health. As there are currently no approved vaccines or treatments for licensed use in Canada, it is important to have good biosecurity practices in place to limit the introduction and subsequent spread of *Histomonas* within the flock.

Transmission of *Histomonas meleagridis* is complicated. There are three possible ways that a turkey could become infected with the disease:

1) direct uptake of *Histomonas meleagridis* into the lower digestive tract of the bird through a process called "cloacal drinking" which occurs when birds are sitting on the litter;

2) ingestion of cecal worm eggs (*Heterakis gallinarum*) that are infected with *Histomonas meleagridis*; and

3) ingestion of common earthworms that contain *Histomonas meleagridis*, or other insects that act as mechanical vectors of the protozoa.

It should be noted that naked *Histomonas* organisms are quite fragile to the external environment but can persist within its cecal worm host and remain infective for several years. Turkeys infected with Histomoniasis show signs of disease at around 7 to 12 days post infection.

Clinical signs include reduced appetite, depression, drooped wings, ruffled feathers, and sulfur -yellow droppings. Contrary to its name, turkeys with blackhead disease generally do not show dark (cyanotic) discolouration of their heads.

The case definition of blackhead is defined as a combination of cheesy cores in cecal pouches and multiple target-like white spots throughout the liver (Figures 1, 2). Together, the cecal and liver lesions are considered diagnostic for Histomoniasis. In the absence of obvious white liver lesions, caseous (cheesy) cecal cores are noted microscopically with histomonad protozoal organism present (Figure 3).

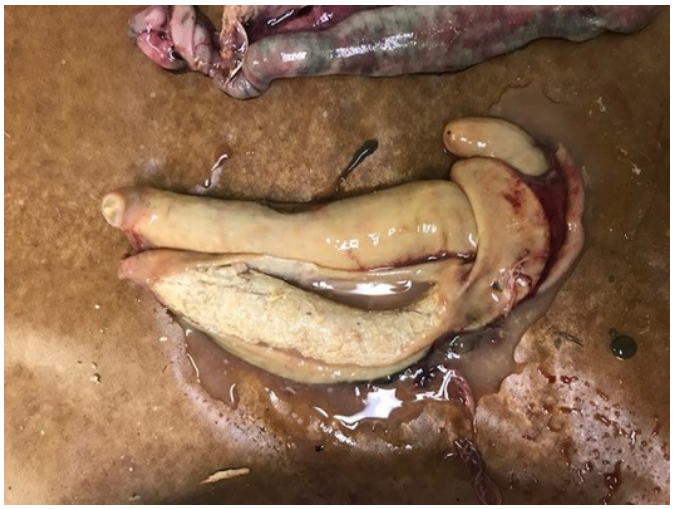


Figure 1. Caseous yellow-green exudates develop into cheesy cores within the cecum of turkeys infected with Histomoniasis. Image courtesy of Dr. Gigi Lin, Canadian Poultry Consultants.

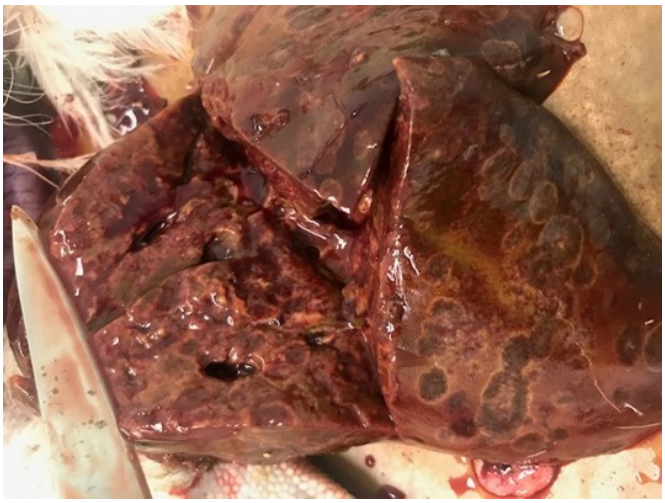


Figure 2. Necrotic, target-like lesions in the liver are noted in turkeys infected with Histomoniasis.

Image courtesy of Dr. Gigi Lin, Canadian Poultry Consultants.

Blackhead *(Histomonas meleagridis)* in Turkeys in BC cont'd

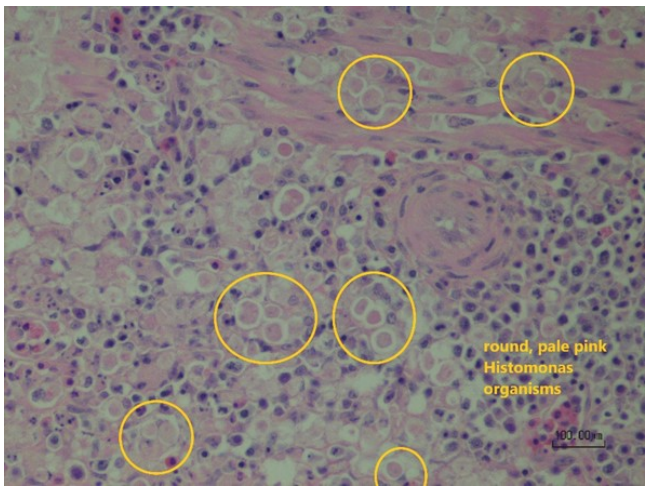


Figure 3. A microscopic view of a blackhead infected cecum. Note the numerous round pink *Histomonas* organisms surrounded by a clear halo. There is an intense inflammatory reaction in the adjacent tissue. Image courtesy of Dr. Victoria Bowes, Animal Health Centre Laboratory.

Since 2020, the BC turkey industry has experienced multi-farm outbreaks of blackhead disease, with significant negative economic consequences for turkey growers, processors, and the hatchery. In response to the outbreak, a collaborative study began in January 2021 in partnership with stakeholders in industry and government.

The goals of the study are to understand the epidemiology of the blackhead in the province, identify on-farm risk factors and reservoirs, and ultimately, to create an effective blackhead disease prevention and control strategy to improve flock health, productivity, as well as profitability of the BC turkey industry.

Blackhead Engagement Strategies

Several engagement strategies have been underway over the past six months. Two web seminars were hosted to share relevant and timely information to BC turkey growers. Presentations from the Ministry of Agriculture, Food, and Fisheries (MAFF), Canadian Poultry Consultants (CPC), and other field experts provided information on topics that included blackhead etiology, disease prevention, and general biosecurity recommendations. Please contact Michel Benoit of BC Turkey Farmers at info@bcturkey.com if you would like a copy of the seminar recording.

Moreover, a questionnaire was introduced as a retrospective investigation to identify on-farm risk factors of blackhead in BC turkey farms. The questionnaire was administered to growers identified as "cases" and "controls" based on the case definition discussed previously. "Cases" are growers that had blackhead disease from January to December 2020, whereas "controls" are growers that did not have blackhead infected flock in the same period. The questionnaire included questions related to turkey production, animal husbandry, farm and barn renovations, biosecurity, litter management, vector control, and more. There were additional questions in the last section of the questionnaire related to blackhead management if the farm was identified as a "case". The questionnaire was sent electronically, and MAFF staff epidemiologist Dr. Doris Leung collected answers from growers through in-depth phone interviews. The results of this questionnaire will be made available to growers in upcoming months. We would like to thank all growers for participating in this questionnaire.

Current Situation

In 2020, the Animal Health Centre (AHC) laboratory received 21 turkey submissions that were diagnosed with Histomoniasis (Figure 4) by either necropsy and/ or histopathology with the presence of histomonads organisms. Infected premises were in Abbotsford and Langley. Summer months accounted for an increased number of cases, with submitted birds and fixed tissue samples from June to August 2020 accounting for 43% of the cases (9/21). The average age of birds with blackhead disease is 62 days of age.

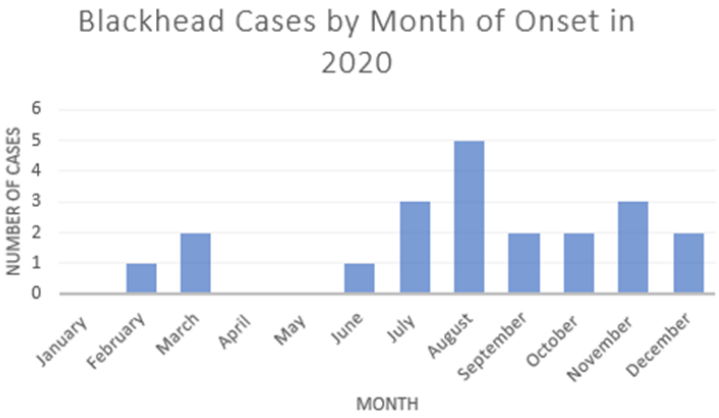


Figure 4. Epidemic curve of 2020 Blackhead cases by month of onset.

As of August 2021*, 8 turkey submissions received by the AHC laboratory were diagnosed with Histomoniasis (Figure 5). Infected premises were in Abbotsford and Langley. Similar to 2020, summer months accounted for an increased number of cases, with submitted birds and fixed tissue samples from June to August 2021 accounting for 75% of the cases (6/8). The average age of birds with blackhead disease is 57 days of age. It should be noted that all infected premises had blackhead outbreaks previously.

*Data collected until August 10, 2021.

Blackhead *(Histomonas meleagridis)* in Turkeys in BC cont'd

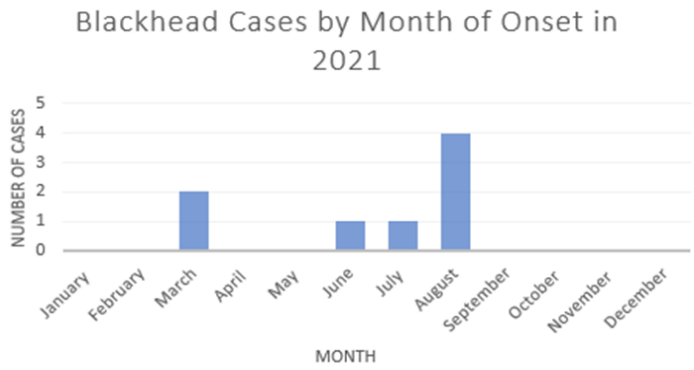


Figure 5. Epidemic curve of 2021* Blackhead cases by month of onset.

Best Practices Recommendations

- Exercise appropriate biosecurity to protect turkey flocks:
  - Ensure adequate use of disinfectants (e.g. at labelled dosage, rotate different class of disinfectant with every cycle).
  - Ensure adequate use of physical and chemical pesticides / rodenticides (e.g. at labelled dosage, rotate different class of insecticide with each cycle). Use pesticides liberally in barn prior to bird placement if there are historical insect infestations (e.g. with darkling beetles).
  - Have extended downtime between flocks, with at least 2 weeks downtime for each barn to allow for thorough cleanout and disinfection.
  - Have a mandatory vehicle disinfection station for all vehicles entering the premise.
  - Have well-defined biosecurity lines prior to barn entrance. Footbath solutions must be changed every 2 to 3 days to maximize disinfectant activity and to remove any organic debris.
  - No sharing of equipment or machinery with other farms, especially with different poultry species. Equipment and machinery should be housed indoors.
  - Do not move equipment or machinery between barns. Machinery used inside the barn should not be used for outdoor pasture or gardening.
  - Good draining around barn perimeters. Apply salt and pesticide to the perimeters to prevent earthworms and other insects from entering barn.
  - Wear new coveralls and boots with each barn visit. Clean and disinfect personal protective equipment (PPE) often.
  - Perform barn visits from youngest to oldest flocks. If there are sick or diseased flocks, ensure that you visit this flock last.
  - Ensure external personnel (e.g. catching crew, cleaning personnel) adhere to similar biosecurity protocols regarding PPE and cleaning and disinfection of equipment or machinery.
  - Restrict outside visitors whenever possible.
- Active repairs and maintenance of the barn:
  - Cracks and crevices on the floor and wall should be filled and sealed routinely. This also helps to minimize pest habitat.
  - Gaps on doorways are being sealed properly to prevent vermin or insects from entering the barn.
- Bird movement:
  - Birds are being moved indoor only.
  - Ensure equipment used to move birds are adequately disinfected prior to and after use.
- Shaving/ litter management:
  - Do not re-use contaminated or old litter.
  - Do not have on-site shaving storage.
  - Fully remove all litter with each stage, not just with brooders. Manure is cleaned out with full blow down, and power washed. Ensure that the concrete floor is fully dried prior to disinfectant application.
  - Ensure concrete floor is fully dried and/or heat treated prior to placement of fresh shavings.
  - Litter condition should be dry with minimal condensation.
  - New litter should be treated with acid, dried chlorine dioxide, etc. prior to bird placement. Ensure a thick layer of litter for each flock.
- Animal husbandry
  - Create a routine deworming program with your veterinarian to bolster bird intestinal health.

Blackhead (*Histomonas meleagridis*) in Turkeys in BC cont'd

- Build partitions near barn doors to prevent drafts and to act as barriers to prevent birds from ingesting earth worms or other insects outside of the barn.
- Ensure birds do not succumb to heat stress with misters or evaporative cooling if needed.
- Minimize exposure to environmental stressors that can be detrimental to bird intestinal health. (e.g. avoid feed interruption from feed outage, feed pens filled with litter, high CO2 concentration in the barn)

- Management practices if you suspect blackhead in your flock:
  - Seek veterinary advice ASAP if birds appear ill. Your veterinarian may perform a necropsy and/or send samples to the AHC laboratory for confirmatory diagnosis of blackhead.
  - Prompt removal of mortalities and contaminated litter ideally off-farm.
  - Ensure proper hand washing hygiene after handling mortalities and sick birds.
  - Ensure equipment or machinery used to handle dead or sick birds is adequately cleaned and disinfected.
  - Cull birds that appear lethargic or depressed.
  - Create partitions to physically segregate sick and healthy birds to reduce the spread of blackhead within the barn.

    Move the flock to a clean barn/ clean litter if possible.

Additional information upon request; please contact Doris Leung at doris.leung@gov.bc.ca

Bluetongue in B.C. California Bighorn Sheep Herd

Glenna McGregor (Veterinary Pathologist), Katie Galliazzo (Industry Advisor for Livestock)

On August 11, 2021, a deceased California bighorn sheep from the Grandby Herd, located near Grand Forks, B.C., was reported to the Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD). By August 20th, upwards of 6 bighorn sheep had been reported dead and 3 relatively fresh carcasses of adult female bighorn sheep were recovered and brought to the Animal Health Centre for post-mortem examination.

All animals were in good body condition. One of the carcasses was too severely decomposed for post-mortem examination. In the other two sheep, the tongues were swollen and dark with extensive submucosal hemorrhage and congestion. The nasal mucosa was diffusely expanded by a large amount of dark purple gelatinous material (submucosal edema and hemorrhage). There was a large amount of stable foam filling the trachea throughout its entire length (pulmonary edema). The lungs were edematous and congested with mottled areas of hemorrhage. Approximately a litre of serosanguinous fluid filled the abdominal and thoracic cavities. There were ecchymoses at the base of the heart. Lymph nodes were diffusely enlarged, dark and hemorrhagic. In both, there was marked bilateral perirenal hemorrhage. Histologically there was hemorrhage, edema and a subtle acute fibrinous vasculitis in multiple organs as well as a severe necrosuppurative glossitis (figure 1). PCR for Bluetongue performed at the Animal Health Centre was positive on the spleen, and this was confirmed on August 26, 2021 by National Centre for Foreign Animal Disease on both the spleen and bone marrow from the three submitted animals. Viral isolation and genotyping are pending. PCR for Epizootic Hemorrhagic Disease was negative on spleen. PCR for *Mycoplasma ovipneumoniae* was negative on nasal swabs.

Mortalities in the infected herd continue at a high level. Of the 12 sheep FLNRORD had collared in this population, 8 have died; however, the exact toll on the uncollared animals and the whole population is unknown. Prior to this outbreak, the total population size was 230 to 240 animals. White tailed deer also appear to be dying in the area; the number affected is unknown.

Bluetongue is a viral infection caused by an Orbivirus, in the family Reoviridae. It is spread by the bites of some species of *Culicoides* midges that are infected by feeding on infected animals, and then, following a viral replication period of 6-8 days in the midge's salivary gland, can transmit the infection to other susceptible animals. There are 27 recognized serotypes. Serotypes 2, 10, 11, 13 and 17 are considered endemic in the US and are immediately notifiable to the CFIA. All other serotypes are exotic to North America and are federally reportable in Canada. Serotyping of the virus in this case is still pending.

Bluetongue in B.C. California Bighorn Sheep Herd cont'd

Midges are the only significant natural transmitters of bluetongue virus (BTV); thus, distribution and prevalence of the disease is governed by ecological factors impacting geographical distribution and abundance of the midges. Because of this, infection with BTV is common in a broad band across the world, which until recently stretched from roughly 35°S to 40°–50°N; however, in the last few decades, BTV has been extending farther north in many parts of the world. In B.C., we have sporadic outbreaks in the Okanagan every several years. These generally correspond to outbreaks in Washington and are thought to be due to windborne midges blowing up from the US rather than due to established midge populations within the province. These generally only occur in the late summer or early fall as the weather needs to be warm (15 to 35°C) for the virus to replicate within the midge, and midge activity ceases with the first hard frost. There is no evidence that bluetongue is able to survive winter in Canada. It does not establish persistent infections in ruminants and so can only overwinter in areas where the midges are able to overwinter. Outbreaks in B.C. with the level of mortality seen this year are uncommon.

Bluetongue can infect a variety of wild and domestic ruminants including sheep, goats, cattle, bison, camelids, deer, bighorn sheep, elk, mountain goats, and pronghorns, but generally only causes severe disease in sheep and occasionally white-tailed deer. It does not infect humans and does not pose a risk to human health.

For livestock, keeping animals inside at dawn and dusk when the midges tend to be most active may decrease the risk of transmission. There are no vaccines for Bluetongue licensed in Canada. The midges that transmit Bluetongue are currently only found in the south Okanagan, this does not pose a risk to livestock elsewhere in the province at this time. If anyone has animals with consistent clinical signs or sudden death of multiple animals, they should contact their veterinarian or the Animal Health Centre.

For more information please see the BC Wildlife Health Website at https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/wildlife/wildlife-health/wildlife-diseases, or the CFIA factsheet at : https://inspection.canada.ca/animal-health/terrestrial-animals/diseases/reportable/bluetongue/fact-sheet/eng/1306116803992/1306121522520

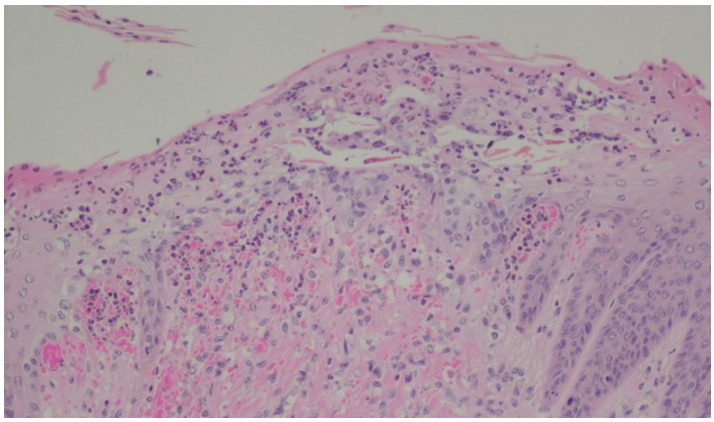


Figure 1: A microscopic view of a tongue from a bighorn sheep with Bluetongue.

Figure 2: Clinical signs of bluetongue infection in ruminants such as sheep include swelling and hyperaemia of the mouth and lips.

Small Scale Pig Production in B.C.

Tom Droppo (Industry Specialist - Dairy & Pork)

B.C. has an estimated 2,000 small scale pig producers. Farms range in size from one to 300 pigs. A national survey of small scale pig producers was conducted in early 2021, and a Final Survey Report released June 2021. This article highlights key findings from that survey.

565 small scale producers representing all provinces responded to the survey. Survey questions focused on operation features, management, awareness of pig diseases and health, and sources of information.

* Distribution of number pigs managed by the 565 producer respondents:
  198 (or 35%) had 1-4 pigs
  109 (or 19%) had 5-9 pigs
  258 (or 46%) had 10 or more pigs

* 94% of producers reported having other livestock in addition to pigs on their farm, while 14% of producers house other animals in the same enclosure as their pigs.

* 74% of producers get their pigs from other swine operations, such as local farms., while 12% indicated they get their pigs from public markets.

* 67% of producers house their pigs outdoors in fenced areas; however, the majority of barriers are wire mesh suggesting that risky interactions with wildlife can occur.

* 25% of producers indicated they don't do anything specific regarding illness & disease reduction.

* 38% of producers are 'not at all concerned' about their pigs developing a disease, while only 23% of producers are 'at least somewhat concerned' about their pigs developing a disease.

* 25% of producers have not heard of foot & mouth disease (FMD) or African swine fever (ASF), and 50% have not heard of porcine reproductive & respiratory syndrome (PRRS).

* 60% of producers have a veterinarian, but 26% feel they don't need one.

* Deadstock disposal methods: 49% by burial, 25% compost, and 21% by scavenging (Western Canada).

* 56% of producers feed their pigs table scraps or food waste from their kitchen, and 3.7% feed meat or meat products to their pigs

* 47% of producers do not perceive any risks associated with feeding food waste from their kitchen or from grocery stores, bakeries, and restaurants.

* Producers were most likely to get their information by word-of-mouth from people they consider knowledgeable: 63% from other pig producers, 53% from veterinarians, and 50% from pig websites.

In 2014, federal legislation was enacted that required all pig producers, regardless of size, to comply with new national traceability requirements. This requires every pig producer to have a Premises ID, all pigs with Animal ID, and any movement of pigs off-farm to be reported to PigTrace, the national pig database. As of August 2021, only 2/3 (or 66%) of small lot pig producers in B.C. have a Premises I.D.

The national survey reveals the need for education outreach to raise awareness of best management practices to improve biosecurity and protect the health of pigs raised by small scale producers. Further information on small scale pig production can be found at B.C. Pork (Small Lot Pork Producers | BC Pork or at B.C. Ministry of Agriculture, Food and Fisheries Pork - Province of British Columbia (gov.bc.ca) .

Domestic and wild sheep and goats, and risk of Mycoplasma ovipneumoniae

Ministry of Agriculture, Food and Fisheries

What is *Mycoplasma ovipneumoniae*?

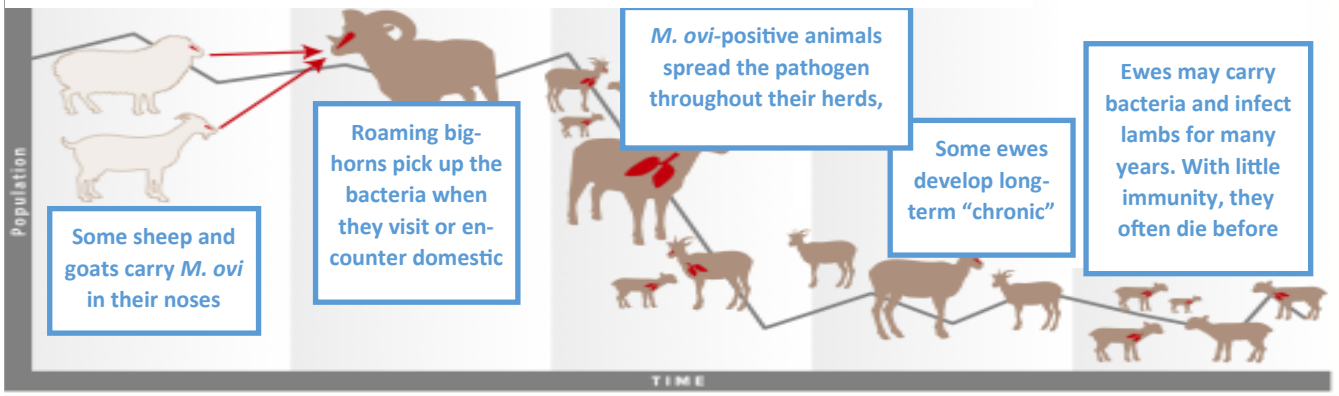
- *Mycoplasma ovipneumoniae* (*M. ovi*) is a bacterial species that is commonly found in the nasal cavity and sinuses of apparently healthy domestic sheep and goats.

- It is transmitted to wild sheep and goat populations via nose-to-nose contact and, less commonly, aerosol/droplet transmission. In wild sheep, infection often causes large all-age die-offs followed by years of poor lamb recruitment, resulting in large population declines.

- In experimental studies, *M. ovi* has been shown to slightly halt weight gains in domestic sheep and may predispose animals to more serious bacterial pneumonia.

- Thinhorn sheep in British Columbia have had little exposure to domestic animal pathogens and are considered more at risk than Bighorn sheep. Exposure to these pathogens is expected to result in significant and widespread losses from either domestic goat or sheep *M. ovi* strains.

What happens during a *M. ovi* outbreak in wild sheep:



Sources:

1. Cassirer, E. F et al. (2018). "Pneumonia in bighorn sheep: Risk and Resilience. *Journal of Wildlife Management.* 82(1): 32-45.
2. Manlove, K. R. et al. (2019). "Risk factors and productivity losses associated with *Mycoplasma ovipneumoniae* infections in United States domestic sheep operations." *Preventive Veterinary Medicine* 168: 30-38.
3. Plowright, R. K. et al. (2017). "Age-specific infectious period shapes dynamics of pneumonia in bighorn sheep." *Ecology Letters* 20(10): 1325-1336.

Domestic and wild sheep and goats, and risk of *Mycoplasma ovipneumoniae* cont'd

How do I know if my sheep or goats are carrying *M. ovi*?

If you are interested in assessing for *M. ovi* in your domestic sheep flock or goat herd, learning more about it is the first step. You may then wish to test your animals. It is strongly advised to discuss your concerns with your local veterinarian. Please contact the Animal Health Centre for more information about obtaining and handling samples, as well as for advice on testing strategies tailored to your flock/herd.

Testing must be accompanied by recognized farm biosecurity measures such as pre-testing and quarantine of new arrivals. Secure fencing is crucial to maintain separation from wild sheep and goats.

Polymerase Chain Reaction (PCR) tests

- The best test for an individual animal is PCR on a nasal swab. This test looks for the genetic material (DNA) of *M. ovi* on the sample tested.
- Animals can shed this organism from their noses intermittently or in low numbers, so repeated testing is often needed to confirm that an individual animal is not infected.
- Seek advice from the Animal Health Centre and work with your veterinarian for interpretation of testing and if repeated testing is needed.

Animal Health Centre

The *M. ovi* PCR test is available at the Plant and Animal Health Branch of the Ministry of Agriculture.

Additional Diagnostic Testing & Services

A full range of fee-for-service diagnostic testing, including Bacteriology, Histopathology, Molecular Diagnostics, Necropsy, Serology and Virology are accepted from veterinarians, livestock producers, the general public and other government agencies.

1767 Angus Campbell Road
Abbotsford, B.C. V3G 2M3
Phone: 604-556-3003
Toll free: 1-800-661-9903
Fax: 604-556-3010

E-mail: PAHB@gov.bc.ca

Can I remove *M. ovi* from my flock or herd?

There are currently no known, easy ways to eliminate *M. ovi* from an infected flock/herd. Early weaning and/or test and cull have shown some success but can be challenging due to the intermittent shedding of the bacteria and may involve culling a large percentage of the herd/flock.

If you have clinical symptoms of respiratory disease in your flock/herd, consult your veterinarian to determine the best diagnostic, and treatment approach.

Sources:

1. Cassirer, E. F et al. (2018). "Pneumonia in bighorn sheep: Risk and Resilience. *Journal of Wildlife Management.* 82(1): 32-45.
2. Manlove, K. R. et al. (2019). "Risk factors and productivity losses associated with *Mycoplasma ovipneumnoniae* infections in United States domestic sheep operations." *Preventive Veterinary Medicine* 168: 30-38.
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Domestic and wild sheep and goats, and risk of *Mycoplasma ovipneumoniae* cont'd

Currently there are no antibiotics proven to eliminate *M. ovi* carriage and shed in domestic sheep and goat flocks. Antibiotic treatment of a flock or herd to try to clear *M. ovi* that is not currently experiencing clinical signs of respiratory disease is not recommended by the Province of BC at this time. Please contact the Animal Health Centre if you have any concerns or questions.

Because *M. ovi* is so difficult to get rid of once a flock/herd is infected, if your flock or herd is *M. ovi* negative having good biosecurity practices, limiting and/or pre-testing and quarantine of all new arrivals (consult your veterinarian and/or the Animal Health Centre for testing recommendations) is strongly recommended.

What can I do to help protect wild sheep and goats from *M. ovi* carried by my flock/herd?

- Avoid housing or grazing domestic sheep and goats where there is risk of contact with wild sheep/goats. An interactive map of Bighorn and Thinhorn sheep ranges can be found here:
- https://catalogue.data.gov.bc.ca/dataset/bc-wild-mountain-sheep-registry-distribution.
- Make sure domestic sheep/goats are confined to well-fenced areas. Ideally with a double fence, at least one of which is 2.6m high, with a space in-between to prevent nose-to-nose contact with wild sheep/goats.
- Test your flock/herd for *M. ovi* and if your flock/herd is negative practice good biosecurity to keep it that way.
- Have guardian animals to minimize the risk of contact with wild sheep/goats.
- If you do see wild sheep mingling with your flock/herd contact RAPP at 1 877 952 7277 as soon as possible. Depending on the circumstances, that wild sheep may need to be culled to ensure it does not carry *M. ovi* back to its herd.

Wildlife Contact Information

If you see a wild sheep or mountain goat mingling with or near your domestic animals, **Call RAPP at 1 877 952-7277** or #7277 on the TELUS Mobility Network or report online https://forms.gov.bc.ca/environment/rapp/

All other wildlife health inquiries can be directed to the **B.C. Wildlife Health Program:** https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/wildlife/wildlife-health

1. Cassirer, E. F et al. (2018). "Pneumonia in bighorn sheep: Risk and Resilience. *Journal of Wildlife Management.* 82(1): 32-45.
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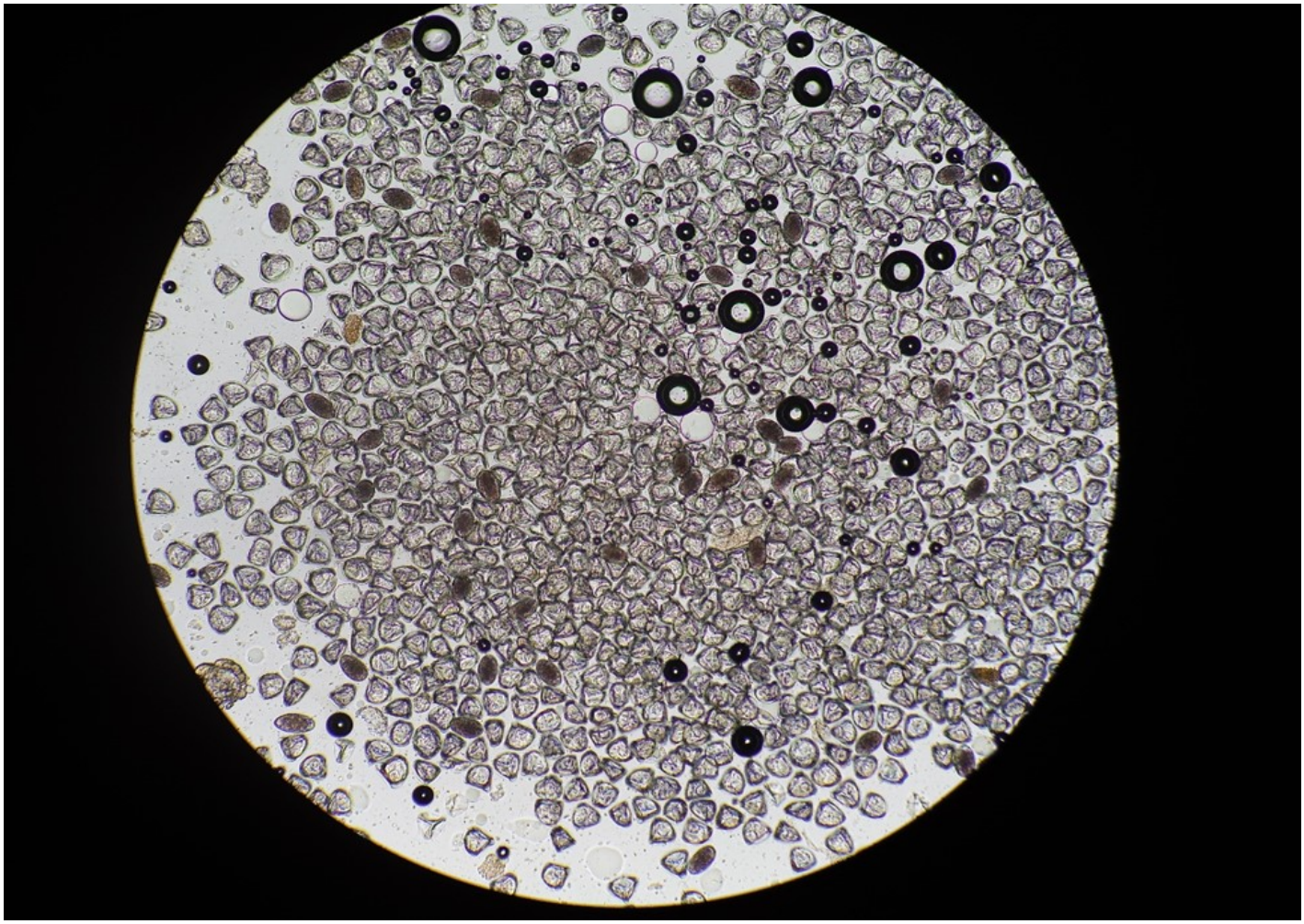
Fecal Parasitology at the AHC Jocelyn Montague

(Registered Veterinary Technician—Post-Mortem)



A microscopic view of a tapeworm infection in a sheep, strongyles also present. Photo credit AHC

Fecal examination is a common laboratory procedure used to diagnose parasitic infections in domestic and wild animals. At the Animal Health Centre, we offer the following tests on fresh fecal samples:

Fecal Flotation: Centrifugal fecal flotation with Sheather's sugar solution is the standard test to concentrate parasite eggs and cysts. Fecal flotation will detect most parasites including Strongyles, Ascarids, Tapeworms, Trichuris, Capillaria and Coccidia. This is a qualitative test to determine which (if any) parasite species are present. The ova are counted, and the test is reported as 1+ (1-24), 2+ (25-99), 3+ (100-299), 4+ (300+) or Negative (None seen)

Fecal Egg count: The Modified McMaster test is used to count strongyle eggs in a measured amount of feces and is recommended to estimate the extent of parasite egg contamination on pastures and/or efficacy of treatment. This test is reported in Eggs per gram (EPG). The fecal egg count has a low sensitivity of 25-50 PG and may not pick up low concentrations of parasite ova.

This test is routinely performed on all sheep and goat fecal samples submitted to AHC that are positive for strongyles and may also be performed upon request for horses, cattle, and other animals. The Modified McMaster is only validated for strongyles, other ova ***will not be counted***.

Baermann Test: The Baermann test is used to isolate larvae from fecal samples and is most often used to diagnose lung-worm infections. ***It is very important the fecal sample be fresh*** as Strongyle type eggs may hatch or if left outdoors feces may be invaded with free -living nematodes, making identification difficult.

Direct Smear for Cryptosporidium: This test is performed on fresh feces in our Bacteriology laboratory to diagnose cryptosporidium infection. A small amount of feces is smeared on a slide and stained for microscopic examination.

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Fecal Parasitology at the AHC cont'd

Sample Collection:

Proper collection and submission of samples to the laboratory is important for accurate diagnosis of parasitic infection. Feces should be fresh to preserve quality and prevent hatching and/or death/degeneration of fragile parasite eggs and oocysts. Collect several grams (approximately a tablespoon) of fresh feces in a clean container or ziplock bag. Remove as much air from specimen container as possible. Label clearly with date, animal's name and whether or not sample is pooled from a group of several animals. Samples should be collected immediately after observing defecation and refrigerated if to be held more than 1 or 2 hours before examination. If sending samples through mail or courier, an icepack should be included to keep sample cool. Freezing should be avoided to prevent distortion of eggs.

Please call 604-556-3007 to speak with one of our Registered Veterinary Technicians if you have any questions about the fecal testing offered at AHC.

REFERENCES

Foreyt, William J. Veterinary Parasitology. 5th edition, 2001

Zajac, Anne M. and Conboy, Gary A. Veterinary Clinical Parasitology. 8th edition, 2012.

Sample Submission to the Bacteriology Section of the PAHB

Jaime Battle (Laboratory Scientist, Bacteriology)

Sample submission is arguably the most important part of the entire laboratory testing process.

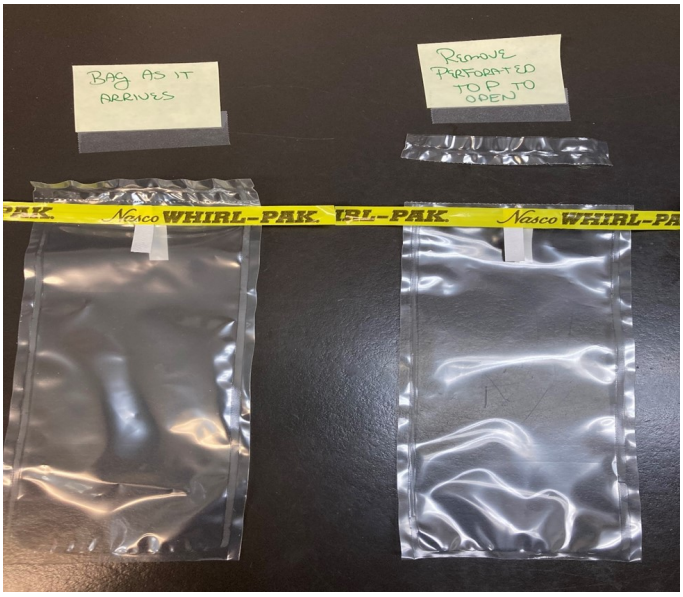
Leaking, old, messy, contaminated, desiccated or otherwise inappropriately packaged/collected samples will result in laboratory delays, loss of sample integrity, contaminated and inaccurate results or in worst case scenarios, refusal of sample/ inability to perform testing required.

Different laboratory sections also have very specific requirements for the submission of samples for testing in that section. For example, samples submitted in bacterial culture media, cannot be used for virology/PCR testing as many of the components of the media/agar will prohibit these tests.

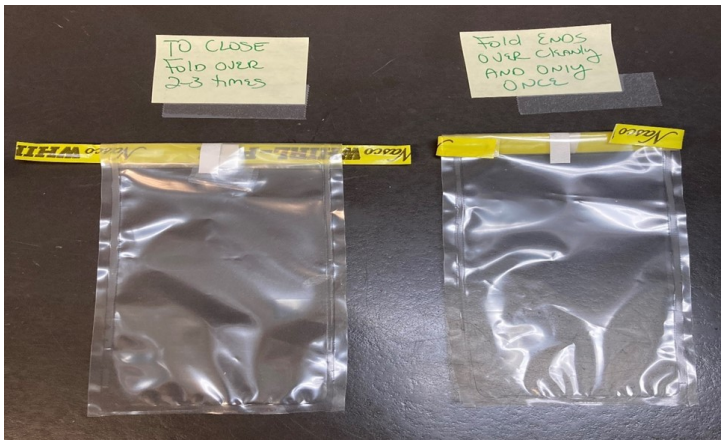
I will only deal with individual fluid/tissue/environmental samples here, whole animals are a different story and are covered under Post Mortem room policies and procedures.

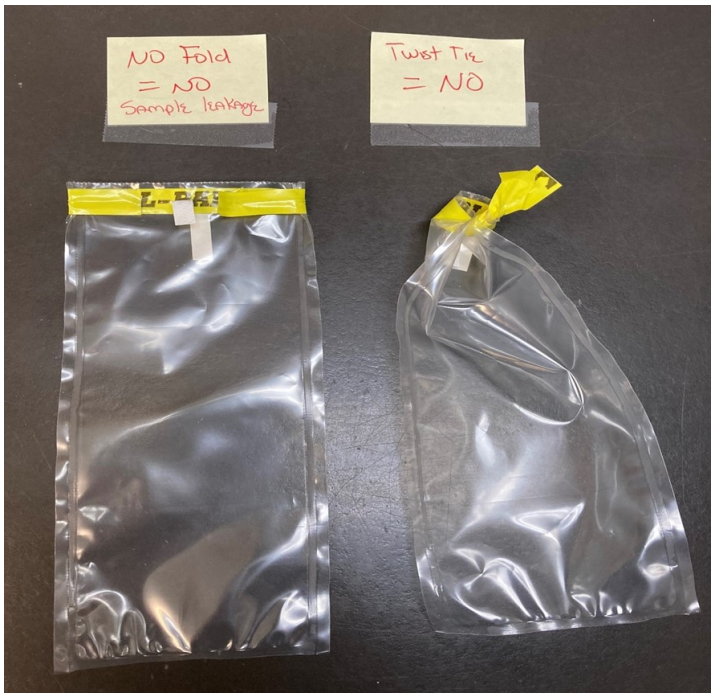
1) When submitting SWABS: Please specify the site the swab is from, ie. Trachea, Cloaca, Yolk Sac, etc. This aids in the type of testing performed and classifies the direction further testing will take. Antibiotic Sensitivities are NOT performed on any environmental samples and any unlabelled swabs will not be assumed to come from an actual animal.
2) Do not submit any samples in a glove. This creates a huge potential for cross contamination of both the sample and the environment in the lab. Urine sample containers, collection vials, etc are all easily accessible and simple to use.
3) Labeling is incredibly important. Please ensure your submission forms match the samples you are sending in. In any cases of discrepancy, we will take the markings on the sample itself as opposed to the information contained in the history. THE SIMPLER THE BETTER. If you have a large number of samples, simple numbering on the lab side is preferable versus us transcribing a large amount of information on site. Keep your spreadsheet data concise and as simple as possible (1,2,3,4, etc as opposed to complicated combinations of numbers and other characters)
4) Liquids (and other samples) in Whirl Pak Bags: This is a particular point of contention in any laboratory that receives samples in these bags. The manufacturer instructions are very clear and using ANY other procedure for use of these bags results in both a compromised sample and no small amount of frustration to laboratory personnel in sample handling and processing.

Removing the top perforation to open the bag is KEY!!!! It retains the integrity of the bag itself by not introducing damage to the seals and closure mechanism, and it also removes the extra bulk so there is better sealing when closed properly (leaving that plastic strip in place provides bulk and space that will result in liquid leakage, it is simply NOT how the system is designed to work).



Sample Submission to the Bacteriology Section of the PAHB cont'd





The outside of your sample containers should also be clean. It's irrelevant if you collected a pristine sample if it will inevitably get contaminated by virtue of us having to get inside to retrieve it (ie gloves)

If you have any questions about sample submission, how to use certain submission containers, please do not hesitate to follow the manufacturer instructions or contact the lab for guidance.

The quality of the results we are able to provide to you, the client, is very much influenced by the quality of the samples we receive. Garbage samples equal potentially garbage results.

This is by no means a comprehensive list, but should give a good guideline on how to submit samples for Bacteriological/Fungal testing.