REPORT #30
JAN.FEB.MAR
2022

Ontario Animal Health Network (OAHN)
Equine Expert Network
Quarterly Veterinary Report

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Don't Forget the Sample Site When Requesting Bacterial Culture !

We are always striving to help equine veterinarians in their day-to-day activities as best we can. Part of that goal is to provide veterinarians with useful information about emerging bacteria and trends in antimicrobial resistance. For this quarter we wanted to see from what sites bacterial cultures were being submitted. We found that for 198 of 257 (77%) bacterial culture submissions, the site the sample was taken from was not listed by the submitter.

77% of bacterial culture submissions had no sample site listed

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Why would this information be important? It would help pathologists, who receive tissue as well, correlate the bacterial growth findings with the histopathology. For straight culture submissions, it would help us determine the common organisms grown from particular sites in Ontario horses and if there were any particular antimicrobial resistance trends with respect to different sites. This could help inform specific management and treatment practices. Usually those submissions without a sample site listed also don't have a clinical history provided. A brief history would strengthen the information OAHN delivers back to Ontario veterinarians.

Please consider adding the sample site and a brief history. Help us help you!!

OAHN Equine Project – Investigation of the molecular prevalence of EHV-1 in placentas from healthy mares.

The OAHN equine network developed this project last year during the EHM outbreaks in Ontario. Following from the work of OVC researchers who found that broodmares normally shed EHV-1 virus intermittently during the year and the occurrence of placenta-positive but fetus-negative EHV-1 infections, the network wanted to know if the stress of parturition stimulated EHV-1 shedding and/or viremia and whether EHV-1 may be present in placentas during birth of clinically healthy foals.

Look for the Q2 survey in July 2022!
Practitioner input is invaluable to help detect regional trends, alert veterinarians to disease clusters and guide further investigation.
The more vets participate, the more useful you will find the results!

Methods:
- Nasal and vaginal swabs, blood and placental tissue were collected from 50 broodmares within 24 hours of foaling.
- DNA was extracted and RT-qPCR testing performed for the non-neuropathogenic and neuropathogenic EHV-1 strains.
- The mare's age, breed, parity, history of abortions or medical issues during pregnancy and vaccination history for EHV-1 were recorded.

Results:
- 36 Standardbred, 12 Thoroughbred and 1 of each Quarter horse and Warmblood broodmares were enrolled. Median age = 8 years (range 4-21 years)
- Median parity= 2 (range 1-13 events)
- 30 were unvaccinated for EHV-1; 20 were vaccinated during pregnancy
- 3 mares had medical issues during pregnancy.
- **EHV-1 strains were NOT detected in any of the samples tested (n=400 PCR tests).**

Conclusions:
- The molecular detection of EHV-1 in placental tissues, blood and nasal or vaginal secretions in late gestation abortions is likely relevant for the diagnostic investigation of EHV-1 abortions, and epidemiologically important for biosecurity measures.

Declarations:
- This project was approved by the University of Guelph's Institutional Animal Care Committee. The authors have no competing interests. Funding was provided by the Ontario Animal Health Network-OMAFRA.

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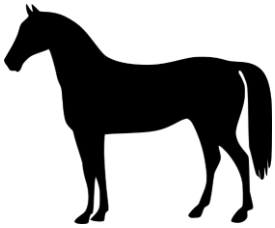

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Foal surveillance data for Q1

Gastrointestinal

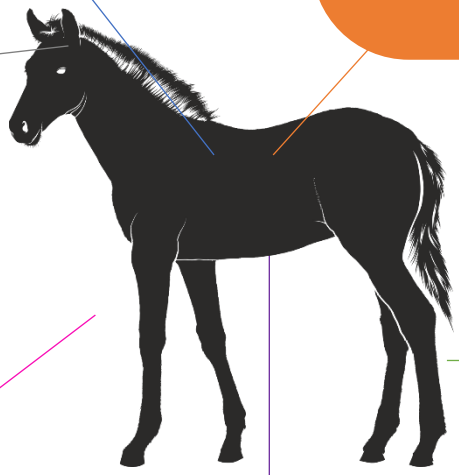
- Diarrhea (2)
- Colicky foals (1)
- No rotavirus ,coronavirus or *Lawsonia* infections reported.
- Congenital diaphragmatic hernia in a neonate. Death shortly after birth due to an inability to inflate lungs due to abdominal organs in the thorax. The rent is considered congenital due to the smooth fibrous contour of the end and not a result of trauma from the dystocia.

Respiratory

- *R. equi* pneumonia (1)

Neurologic

- Dummy foals
- Hydrocephalus in a fetus



Musculoskeletal

- Angular limb deformities (1)

Systemic

- Failure of passive transfer (1)
- Septic foals

Genitourinary

- Omphalitis (1)

Increase in clinical presentation for the quarter based on veterinarian survey (number in parentheses = number of veterinarians reporting)

Decrease in clinical presentation for the quarter based on veterinarian survey (number in parentheses = number of veterinarians reporting)

New or clinical signs without a dx as reported by veterinarians

Laboratory data*

Postmortem data

Network Member Responses

* Lab data is from the Animal Health Laboratory – University of Guelph

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Adult horse surveillance data for Q1

Respiratory

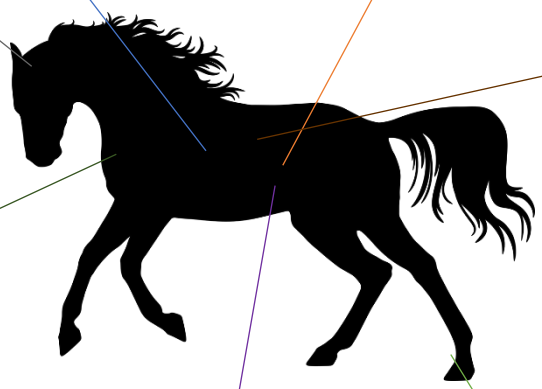
- Equine Asthma (7)
- Sinusitis (1)
- Pharyngeal swelling with respiratory difficulty and mild fever.
- Strangles, equine asthma, *S. zoopeidemicus* upper airway infections.
- Streptococcus equi PCR 32% positive
- One positive Influenza virus PCR as part of a respiratory outbreak (1/6 samples). No rhinitis A/B detected from 6 serum samples submitted.

Gastrointestinal

- Medical colics (2): mainly displacements and impactions (1) colic (1)
- Peracute colitis (1) diarrhea (1)
- Irritable bowel syndrome (1)
- Free fecal water syndrome (1)
- Chronic diarrhea over the winter (no fever/weight loss, bloodwork mildly low TP, responds to sucralfate/ returns when treatment is discontinued)
- Mediastinal infection due to esophageal perforation
- Hemorrhagic enteritis due to *Paeniclostridium (Clostridium) sordelli*
- Fecal egg count (McMaster 17.4% >500 epg, Wisconsin 13.2% >500 epg.)
- One horse positive for Salmonella sp (1/19)
- 14/31 GI accidents, 7/31 enteritis/typhlitis/colitis cases

Neurologic

- EPM, Wobblers, EHM
- Spinal/nerve root pain in performance horses
- EPM CSF Index – 0 positives, 5 horses with SAG 1:250, 9 horses >1:250
- 6/10 miscellaneous neurologic dz



Dermatologic

- Pastern dermatitis (2)
- Fungal/bacterial dermatitis (1), Lice (1)
- Atopy (1)
- Pastern dermatitis, some developing cellulitis
- 11/23 histopathology cases determined to be dermatitis

Endocrine

- PPID (1)
- EMS (1)
- Endocrinopathic laminitis (1)

Other

- Laminitis (2)
- Uveitis due to leptospirosis (1)
- Severe vaccine reactions
- Anaphylaxis after SC Exceed
- Lyme disease (2) ; anaplasmosis (1)
- Vaccine reactions
- Chronic limb edema and cellulitis, normal bloodwork
- Donkey with emaciation and pulmonary, hepatic and renal hypoplasia.

Genitourinary

- EHV-1 abortion (1)
- Post-partum deaths (possible hemorrhage) (1)
- Abortion / dystocia (1)
- Post-partum hemorrhage, uterine torsions, dystocia, C-sections.
- 3 positive EHV-1 nasal swabs (two abortion cases, one nonclinical mare) 3/142 samples submitted)
- 7/15 idiopathic abortions
- One primary mycotic abortion with pyogranulomatous inflammation and fungal hyphae.. Grew 4+ *Helcococcus* sp

Musculoskeletal

- Spike in medial femoral condyle subchondral cysts (yearling SB – 6 cases, 2/3 in R stifle)
- More horses with navicular syndrome responding less to coffin joint therapy and more to navicular bursa therapy.
- 10/30 postmortem cases diagnosed with primary skeletal/tendon injuries

Increase in clinical presentation for the quarter based on veterinarian survey (number in parentheses = number of veterinarians reporting)

Decrease in clinical presentation for the quarter based on veterinarian survey (number in parentheses = number of veterinarians reporting)

New or clinical signs without a dx as reported by veterinarians

Laboratory data*

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Network Member Responses

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Network Member Reports

Northern Region (Drew Hunnisett)	Normal and representative caseload for this time of year.
Southwestern Region (Melissa McKee)	This quarter we saw an increase in asthma corresponding to the increasingly warmer and windy weather. Typical for this time of year, we also saw an increase in moist dermatitis/fungal skin conditions and other skin issues related to blanket and equipment hygiene. Lice was diagnosed in a couple of rescue horses but did not spread to other horses in the barn. One mare diagnosed with a suspicious thoracic mass was diagnosed with EHV-1 infection . The foal had been developing well but the mare succumbed to her condition before it was born. We seem to see vaccine reactions getting worse every year. We also had an unusual case of anaphylaxis after Exceed administration. More cases of medial femoral condyle subchondral cysts in young Standardbreds were diagnosed this year than in previous years with 2/3 in the right stifle. No genetic predilection was identified. One large cysts was visible on radiograph but negative on bone scan. One 3 –year-old who radiographed clean as a 2-year-old developed a large stifle cyst this year. A few strangles cases were also reported.
Thoroughbred Industry (Jessica Peatling)	This information was based on feedback from Woodbine backstretch veterinarians. Racing just started in April. It's been a quiet quarter with no infectious disease or injury trends to report. The new single event sports bet may create a looming economic issue for the sport.
Eastern Ontario (John Donovan)	We continued to see upper airway infections with *S. zooepidemicus* (continued from Q4 2021). With the onset of spring, we saw an increase in pastern dermatitis cases, some of which developed into nasty cellulitis cases that required long term antibiotic therapy to resolve. Equine asthma and other allergic presentations (e.g. conjunctivitis) were also on the increase with the advent of spring. With the new spring grass came the occasional spasmodic colic. Lots of healthy foals were born but there was the odd one with FPT which required plasma therapy. After switching pharmaceutical companies, we've seen fewer vaccine reactions this year. We will be trying T-61 for euthanasias (following general anesthesia) as the deadstock company will no longer pick up animals euthanized with barbiturates.

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Ontario Veterinary College (Memo Arroyo)	As expecting during breeding and foaling season, we've seen a number of mares with dystocia, uterine torsions , post-partum hemorrhages and mares who have required C-sections. We've also had a few septic foals and some dummy foals. We have also had some pre-partum fetal deaths where the mares were sick and/or had placental insufficiency. One mare had ventricular tachycardia postpartum. We've had horses with a variety of colic signs and causes. One horse had a mediastinal infection from an unusual traumatic esophageal perforation. One horse had an infiltrative meningitis but the cause could not be identified (negative to all testing). We also diagnosed what appears to be the first case of *Paeniclostridium (Clostridium) sordelli* as a cause of hemorrhagic colitis in Ontario.
AHL Pathology (Emily Ratsep)	• Female draft fetus - Histology confirms placentitis; pyogranulomatous inflammation and numerous fungal hyphae support primary mycotic abortion. Culture returned +4 *Helcococcus* sp., from the lung; this could represent a co-infective bacterial agent but there is no supporting bacterial growth form the placenta or stomach fluid, and the significance of this isolate is uncertain. Diagnosis: mycotic abortion; necrotising and pyogranulomatous placentitis. • Filly TB neonate - In horses, congenital diaphragmatic hernias are a rare developmental lesions associated with stillbirth, intermittent bowel obstruction, or occasionally newborn colic. In this case, the likely cause of death shortly after birth was inability to inflate lungs due to massive compression by a large portion of the abdominal organs being located in the thorax. The rent is considered congenital due the smooth fibrous contour of the edge of the opening (no tearing or hemorrhage), and not a result of trauma from the dystocia described in the history. Histopathology has not been requested as microscopic review is unlikely to further this diagnosis. Diagnosis: congenital diaphragmatic hernia • Male warmblood fetus - This foal had severe hydrocephalus that likely caused marked atrophy and eventual loss of most of the tissue of the forebrain and midbrain. The marked dome-like expansion of the calvarium is the characteristic feature of hydrocephalus and indicates that brain tissue was once present within the cranial vault as the growth of the brain has an inductive effect of the growth of the bones of the skull. This contrasts to cases of hydranencephaly (in which the brain never develops) in which the absence of a brain tissue is accompanied by a smaller than usual or normally sized skull. A gelatinous clot of tissue was present adhered to the meninges of the dorsal cranial vault – this may represent a markedly atrophic remnant of the forebrain. Hydrocephalus of this severity would have, unsurprisingly, been incompatible with post-natal life. With the exception of the few specific examples in certain domestic species,

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AHL Pathology (Emily Ratsep)	• congenital hydrocephalus remains an anatomically obvious but pathogenetically obscure condition. Hydrocephalus is uncommon in horses. A series of cases is described in Friesian foals, probably associated with malformation of the petrosal bone and stenosis of the jugular foramen. No such malformations were noted in this case. Diagnosis : hydrocephalus • 19 year old warmblood gelding - There is extensive necrosuppurative inflammation throughout the tongue, lung, and kidney. The fibrosis is most extensive in the tongue, which indicates it is the most chronic lesion and supports this site as the most likely source of systemic spread of infection. Bacterial culture grew numerous organisms from all three affected sites; multiple Enterococcus species were common to all three which also supports infection originating in the oral cavity as these bacteria are common gastrointestinal commensals and opportunistic pathogens. Fibrosis was also present in the kidney with superimposed multifocal suppurative inflammation. These lesions may reflect a chronic ascending pyelonephritis with more recent embolic lesions; alternatively, embolic nephritis may have occurred repeatedly over a prolonged interval but this is considered less likely given the uniform age of the lung lesions. Assessment of the urinary bladder was hindered by the extent of autolysis. Presence of neutrophilic debris in the trachea suggests both hematogenous spread and inhalation likely played a role in pulmonary infection; regardless of origin, all pulmonary lesions were of acute duration with no evidence of fibrosis. Diagnosis: tongue: necrosuppurative myositis, and sepsis (lung, kidney) • 26 year old warmblood gelding - The histologic features of the intestinal lesions are consistent with an inflammatory process targeting the tunica muscularis. The inflammatory cells do not appear to target myenteric ganglia or blood vessels. These lesions are typical of lymphocytic or lymphohistiocytic leiomyositis causing intestinal pseudo-obstruction in other species. Thus we suspect that the lymphohistiocytic inflammatory response has damaged the myocytes in the muscular layers and this would have impaired proper contractility of myofibres resulting in a functional obstruction and the recurrent impactions. Diagnosis - intestinal lymphohistiocytic leiomyositis (intestinal pseudo-obstruction) • 6 year old Quarter Horse gelding - The histological diagnosis is lymphoplasmacytic inflammation that may or may not have a neutrophilic component. EPM and EHV1 were considered but these typically present with different clinical signs. Samples of cerebrum and cerebellum were negative for EEEV, WNV on PCR. The FA testing done by OMAF was negative on submitted frozen cerebrum and cerebellum. Rabies testing was negative. Diagnosis: lymphoplasmacytic perivascular encephalitis • 2 year old donkey jack - The cause of death is suspected to be a combination of the poor body condition (with potential impact by recent extreme cold). The absent adipose stores and serous atrophy supports a prolonged negative energy imbalance. However, the cause remains uncertain. The teeth were unremarkable and abundant feed material was present throughout the digestive system. An underlying physical or

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AHL Pathology (Emily Ratsep)	• metabolic condition cannot be entirely ruled out and may be further suggested by the reduction in organ size (liver, lungs and kidneys). Developmental hypoplasia is suspected, though organs were otherwise unremarkable in structure both grossly and histologically. The cause of this finding is uncertain. The other main gross finding were the small areas of fibrosis throughout the heart. Mature fibrous tissue was captured on histopathology however, again, the underlying cause is uncertain. These areas of fibrosis may potentially reflect resolution of past areas of infarction. While there were no physical signs of congestive heart failure, acute impact on myocardial conduction remains possible (though this is purely supposition). The significance of this change is uncertain. Diagnosis: Emaciation with pulmonary, hepatic and renal hypoplasia. • 26 year old mare - The primary disease process contributing to the clinical deterioration of this animal was one of widespread thrombosis, haemorrhage, oedema, and ischaemic necrosis of the right lung. However, the reason for the development of this severe lesion was not determined. There was no histological evidence of an underlying pneumonia, vasculitis, or other disease process that may have been the initiating factor in development of pulmonary thrombosis. Viral PCR to rule out pulmonary vasculopathic disease caused by equid herpesvirus-1 was performed, and the results were negative. Thrombophlebitis is discussed in the literature as a predisposing cause of pulmonary thromboembolism in horses; however, no evidence of this disease process was noted during postmortem examination (Norman et al., 2008). Correlation to clinical history (i.e. recent venipuncture preceding clinical signs) may assist in determining the likelihood of this aetiology. The extensive retroperitoneal haemorrhage was histologically acute and composed only of bland haemorrhage and recently exuded fibrin. This may have been a manifestation of consumptive coagulopathy secondary to pulmonary thrombosis; however, the reason for localization to the retroperitoneal spaces remains undetermined. Diagnosis: severe pulmonary thrombosis with hemorrhage and ischemia of right lung; severe retroperitoneal hemorrhage.
Alison Moore (OMAFRA)	A maiden QH mare at a private farm in the Regional Municipality of Waterloo delivered a stillborn foal in January. The foal (lung/liver) tested positive for EHV-1 (non-neuropathogenic strain) by PCR. All other mares foaled normally at the end of February.. All mares were vaccinated at 5, 7 and 9 months. In March, an unvaccinated mare from a private farm in Perth County aborted at a referral clinic and the fetus tested positive for EHV-1 (neuropathogenic strain).

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Equine Research from Ontario and Around the World

Ontario researchers involved

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Research Ontario Equine

ResearchONequine.ca is a website developed by the Ontario Animal Health Network equine network to help increase research awareness and to connect researchers from academia, industry and government with the ultimate goal of improving the lives of all equines. It was supported by OAHN and the Ontario Association of Equine Practitioners.

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