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

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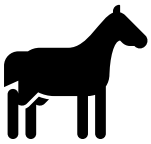

Read about our OAHN Equine ACTH project !

"Investigation into the seasonal variations in ACTH levels in Ontario's senior horses (aged 15 years+)"

BITS 'N SNIPS *(or "things we talked about on the network call")*

Chewing Lice (Werneckiella equi)

There were a number of references to "lice" as an increasing problem this quarter with several horses on a farm affected . The source of the infections were not easily identified.

Lice spend their entire life cycle on the horse. A female lives for 30-35 days and deposits 1 egg/day. The eggs hatch in 5-20 days into nymphs. The lice breed in the hair coat, and winter coats make for a particularly welcoming habitat . The lice feed on dead skin cells, hair and secretions. Lice are transmitted directly between horses or indirectly by fomites (e.g. grooming equipment, fence posts.). The lice can only live for a couple of days off of the host.

Clinical signs: Pruritis, skin irritation, rough coat., nervous attitude. Chewing lice are found most commonly on the head, mane, tail base, shoulders, trunk.. The eggs are white and are "glued" to the hair shafts. Chewing lice move quickly.

Treatment: There are no available dusts for horses anymore. For horses, the only approved products are sprays or wipe-ons and the products must reach the skin. Many people will clip their horses prior to application but this must be done in light of the horse's management. Oral ivermectin does not work as well for chewing lice as it does for sucking lice. All fomites should be washed and treated with an effective insecticide.

Most insecticides kill adults and nymphs but not eggs and therefor a second treatment 14-21 days after the first is necessary. Some veterinarians will recommend treatments three times, 10 days apart. Some horses will react to the products with skin sensitivity (itchiness, hair discolouration).

If weather permits, horses can be bathed in a insecticide-based shampoo.

Recently, essential oils , namely tea tree or lavender oil have been shown to decrease louse populations in donkeys (and people). Essential oils in the management of the donkey louse, Bovicola ocellatus

Look for the Q2 survey in July 2023!
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!

Below is a list of products registered in Canada that would be effective against lice when used appropriately. Only two are labelled for lice treatment and are only for nymphs/adults.

To look up the ingredients in an insecticide spray please go to the Pest Management Regulatory Agency label search here.

Product	1st ingredient	2nd ingredient	3rd ingredient	Comment
Bronco Water Base Equine spray	Pyrethrins 0.05%	Piperonyl Butoxide 0.5%	Permethrin 0.10%	Labelled for lice
Knock Down Equine Fly Spray	Pyrethrins 0.05%	Piperonyl Butoxide 0.5%	Permethrin 0.10%	Labelled for lice
Absorbine Ultrashield EX	Permethrin 0.5%	Pyrethrins 0.1%	Piperonyl Butoxide 1.0%	
K-G Insecticide Foam for horses	Permethrin 0.5%			
Doktor Doom "No flies on us"	Permethrin 0.5%			
Greenline Flying Insect Horse Spray	Permethrin 0.5%			
Klenze 15 Insecticide for horses	Permethrin 0.5%	Pyrethrins 0.1%	Piperonyl Butoxide 1.0%	
Wipe Liquid wipe-on fly repellent	Pyrethrins 0.2%	Piperonyl Butoxide 0.5%		
Other Products				
Clean-up II with IGR (pour on)	Diflubenzuron 3% (inhibits egg development)	Permethrin 5.0%		Labelled for horses and for lice in the US. In Canada, it is for EMERGENCY USE only and only to control chewing and sucking lice on beef and dairy cattle in BC, AB , SASK, MB, ON and QUE until October 12, 2023. Microsoft Word - English Label 2022-5202.DOCX (hc-sc.gc.ca) INS Clean-UpIIInsecticide_IGR_Label.pdf (kc-usercontent.com
Adventix II	Imidacloprid 8.8%	Permethrin 44%	Pyriproxyfen 0.44%	This would be off-label use. Veterinarians are using this product for tick prevention in horses. Natural infestation of the chewing lice (Werneckiella equi) on horses and treatment with imidacloprid and phoxim Dermatological and parasitological evaluation of infestations with chewing lice (Werneckiella equi) on horses and treatment using imidacloprid

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Ergot alkaloid toxicity

After a Standardbred breeder lost 4 foals, one from abortion and three due to dystocia from malpresentation, he began his own investigation into a potential cause. He was suspicious of the hay as this was the first year they had baled their own hay from the paddocks. They had been feeding that hay since late fall/early winter. The first abortion occurred in January and then the dystocias began in late February/early March. One of the next mares due to foal also had placental edema on ultrasound examination. Although not what veterinarians consider the typical presentation for "fescue toxicity" (prolonged gestation, agalactia), the breeder was concerned and sent hay and straw samples for ergot alkaloid testing. The results: 387.4 ppb in straw and 50 ppb in hay. Foaling issues can be experienced with ergot alkaloid levels as low as 20 ppm. The breeder replaced the straw and hay and had no more issues.

Ergotism is caused by the endophytic fungus Claviceps purpurea which lives on a variety of hays and pasture grasses. The main alkaloids produced are: ergotamine, ergostine, ergocristine, ergoryptine and ergocornine.[1] Mares are sensitive to ergot alkaloids, affected by concentrations as low as 20-100ppm, compared to cattle (1000-2000ppm).[1] The alkaloids suppress serum prolactin and progestagens causing a prolonged gestation, agalactia and a thickened edematous placenta. Foals are born small, weak or stillborn. Dr. Bob Wright et al. reported a case of ergotism in a group of late-gestation mares in Ontario caused by consumption of cereal rye straw bedding.[2] The mares foaled around their normal due date but had signs typical of fescue toxicity. Of the 8 mares to foal, 7 had dead foals. There are several management recommendations listed here, but because most of the endocrine effects of ergot alkaloid exposure occurs after day 300 of gestation, removal of pregnant broodmares from sources of ergot alkaloids at least 30 days before expected foaling has been successful.[3]

In 2022, several farms across Ontario with varying species (cattle, small ruminants) had animals displaying clinical signs of ergotism.

Testing forages for ergot alkaloid can be done at a variety of laboratories, some of which are listed below:
Mycotoxins – Actlabs (Ontario)
Ergot - Dairyland Laboratories, Inc. (dairylandlabs.com)
Sample Collection Guidelines for Ergovaline Testing | University of Kentucky Veterinary Diagnostic Laboratory (uky.edu)
Ergot Alkaloids by LC/MS/MS Screen - NDSU VDL

References:

1. Ergot alkaloid (ergopeptine) toxicity in horse hay and pasture | ontario.ca
2. Wright RG, Boyce B, Van Dreumel T, Hazlett MJ, Cross DL. Ergot alkaloid toxicity in foaling mares associated with eating cereal rye straw. Abstract presented at Equine Nutrition and Physiology Symposium, Lexington KY May 28/01.
3. Endocrine alterations associated with ergopeptine **alkaloid** exposure during **equine** pregnancy.Evans TJ.Vet Clin North Am Equine Pract. 2002 Aug;18(2):371-8,

Other useful information:
Using On-Farm Monitoring of Ergovaline and Tall Fescue Composition for Horse Pasture Management.Lea KM, Smith SR.Toxins (Basel). 2021 Sep 25;13(10):683. **Free PMC article.**

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Network Member Reports

Southwestern Region (Melissa McKee)	Strangles cropping up quite regularly this quarter and boarders /horse owners have been taking it more seriously. Many barns are requiring a negative S. equi PCR on nasopharyngeal lavage. There was a case of EHM due to the non-neuropathic strain in an older horse, with a good vaccination status. He showed typical signs (ataxia, weak behind and urine dribbling) . We seem to have diagnosed more mares with placentitis than in other years, an abortion with a long umbilical cord, and one facility with ergot alkaloid toxicity. We have also seen several cases of lice this quarter. Vaccine reactions (fever, neck pain, mild colic) continue to occur particularly with the multivalent vaccines and rabies. (multi vaccines and rabies). We have had fewer reactions with separating the vaccines . Several horses returning from Florida had colic and some required fluid therapy.
Western Region (Tara Foy)	We had a number of farms dealing with lice this quarter. As well, a number of farms were dealing with foal diarrhea (we might have the KY strain of rotavirus Rotavirus Information Center | Gluck Equine Research Center (uky.edu)). We also saw a number of dystocias, periparturient emergencies and respiratory disease in foals
Eastern Ontario (John Donovan)	We had a few reproductive issues this quarter: one dystocia and one retained placenta in a mare that developed toxemia and subsequent laminitis We have had foals with failure of passive transfer, one with sepsis , one with a septic joint, one with contracted tendons, and one with a valgus angular limb deformity, This quarter we also saw a number of colics (impactions, in Jan and Feb and spasmodic colics in the last couple of weeks. We also saw a very interesting case of equine hiccups in a 3 year old Hanoverian filly who began training. Unilateral swelling of the larynx and Grade 3-4 gastric ulcers were diagnosed on endoscopy and the hiccups have resolved with ulcer treatment. We also saw an Increase in lice cases this quarter as well as Clyde itch in the heavy horses. We diagnosed two fractures in Jan/Feb: a hind cannon bone fracture and a P1 fracture. We are also seeing a lot of ticks, likely due to the mild winter. We continue to use large dog Advantix off –label.
Ontario Veterinary College (Memo Arroyo)	We saw a fair amount of Strangles cases this winter. We had a few lacerations as well as a a couple of foals with gastrocnemius rupture due to dystocia with general good prognosis . We had typical postpartum mares with hematomas, vulvovaginal tears and retained placentas. We haven't had to perform many C-sections this quart and we don't feel our dystocia caseload is increased over other years. Our total number of mares and foals admitted to the hospital is down.

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AHL Pathology (Emily Ratsep)	• A 10 yo Fjord mare was diagnosed with eumycotic mycetoma. The mare had a single immobile rounded mass with an irregular surface on the lateral aspect of the base of the tail. It was first noticed in December 2022 and was increasing in size. Histology revealed a localized lesion composed of multiple pyogranulomas surrounding discrete aggregates of fungal elements, which grossly might have looked like granules. This is the typical presentation of an eumycotic mycetoma. There are a variety of causative fungal organisms reported in the literature for this type of lesion (in geographical areas outside of Southern Ontario), and in a series of 34 equine cases excision was considered curative . Results of ITS sequencing showed 100% sequence similarity (527/527 bp) to the ITS region of three aspergillus species: *A. nidulans, A. rugulosus, and A. quadrilineatus*. There is a single report of a subcutaneous mycetoma-like granuloma caused by *A. versicolor* in a horse. • A 16 year old QH mare was diagnosed with deep dermal neutrophilic vasculitis with fibrinoid necrosis, fibrinohemorrhagic cellulitis and perivascular dermatitis. She presented with acute development of limb swelling, cutaneous masses all over the body, ecchymoses in the nasal mucous membranes, tachypnea, tachycardia, enlarged left submandibular lymph node, increased respiratory sounds in both hemithorax, dehydration, firm semitendinosus muscles bilaterally, mild icteric sclera, cervical pain, and was lame 3/4 from RHL, SAMPLES WERE TAKEN FROM MASSES IN SKIN. The most severe finding in these samples is neutrophilic vasculitis which can be seen in immune-mediated and/or hypersensitivity reactions, septicemia or equine purpura hemorrhagica. It is not uncommon for these lesions to cause cutaneous infarction, as seen in these samples. Clinical information is helpful to distinguish from septicemia or immune-mediated etiologies. In septicemia, there would usually be vasculitis in other tissues and not just the skin. The accompanying perivascular dermatitis is a non-specific finding that accompanies many cutaneous reactions. • A 1 day old Clydesdale filly was diagnosed with xenobiotic induced rhabdomyolysis with secondary acute renal tubular injury. The filly was treated for contracted flexor tendons with oxytetracycline administered at the farm. She was not urinating so was catheterized and the urine obtained was brown in colour. Due to the guarded prognosis without proper medical treatment, the owner elected euthanasia. Histological examination confirmed multifocal, monophasic myonecrosis, which is supportive of a single insult from drugs/chemicals. The lesions were acute in nature, which is consistent with the history of a recent treatment with oxytetracycline and subsequent euthanasia. Oxytetracycline has been reported to cause rhabdomyolysis in two foals and rarely causes acute renal injury (in the face of concurrent diseases/disorders including hypovolemia and ischemia) . Evidence of other causes of myonecrosis (such as bacterial or viral infection) were not apparent. There was mild renal tubular injury and evidence of myoglobin in the section of kidney examined. These lesions do not match the severity of those reported by Fletcher et al., which were related to oxytetracycline administration. However, the duration and dose were unknown in this case, and these may be early signs of injury.. The presence of protein and keratin squames in the alveoli are likely due to aspiration following fetal distress during parturition (suspected due to the large foal and contracted forelimbs).

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AHL Pathology (Emily Ratsep)	• A 12 year old male donkey was diagnosed with Asinine herpesviral pneumonia. The donkey had a history of respiratory distress, fever and tachycardia. The donkey died approximately 4 hours after clinical signs were noticed. An older donkey on the premises had died the night before. Lung lesions were chronic and severe and compatible with those histological changes noted in fibrosing interstitial pneumonia associated with infection with asinine herpesvirus 4 and 5. These gamma herpes viruses are different from the alpha herpes virus of equid herpes virus 1. Potentially, the chronic fibrosis of the heart was a result of pulmonary hypertension from the intense pulmonary fibrosis, but impossible to tell at this stage. In addition, there may have been an acute septic process that may have contributed to the rapid decline of this donkey. Neutrophilic inflammation in the kidneys and liver was suggestive of this, however the nidus of the infection remains uncertain. It is possible that the severity of the chronic lung lesions was masking an overlying more acute infection in the lung tissue. • A 17 year old mare was euthanized due to necrosuppurative cystitis. She presented with a history of colic along with anuria. The gross lesions identified within the bladders mucosa and serosa were consistent with severe diffuse necrotizing and ulcerative cystitis of possible bacterial etiology. There was diffuse necrosis of the superficial layers of the urinary bladder, along with abundant granulation tissue and fibrosis within the muscular layer and numerous foci of necrosis of the smooth muscle. This is consistent with the history of prolonged and severe cystitis. The degree of injury and necrosis in the wall of the urinary bladder was sufficient to have caused severe dysfunction and difficulty urinating. The bacteria cultured from the postmortem included moderate to heavy growth *of Clostridium novyi, Enterobacter cloacae,* and *Klebsiella oxytoca*. This is different from the bacteria cultured from the antemortem sample (*Staphylococcus epidermidis*) *C. novyi* has been associated with severe necrotizing diseases in horse including rhabdomyolysis and hepatitis, however no reports of this bacteria in cystitis could be found in the literature. Klebsiella species are associated with cystitis in various species including dogs, cats, and humans. Enterococcus species are common gastrointestinal commensals and may represent antemortem ascending infection or postmortem contamination. • A mare was diagnosed with eosinophilic collagenolytic granuloma based on biopsy of the eyelids. The mare had a history of numerous smooth lumps in the lids of both eyes. The left eyelid mass was inflammatory and not neoplastic. The nature of the histologic lesions is most consistent with an eosinophilic collagenolytic granuloma, a common equine skin lesion of uncertain etiology. A hypersensitivity response to insect bites is one speculated cause and both trauma and atopy have also been proposed. Lesions of equine eosinophilic collagenolytic granuloma can be single or multiple and can occur anywhere on the body. They are most common on the withers and back, however they are also frequently found on the face.
Alison Moore (OMAFRA)	Strangles became an immediately notifiable disease this quarter. We had 5 facilities affected in Oxford, Simcoe, Wellington, Grey, and Lanark Counties We had two farms affected by EHM due to EHV-1 this quarter. Both farms were in Wellington County . Please follow Outbreaks | Equine Disease Communication Center (equinediseasecc.org) for reported outbreaks.

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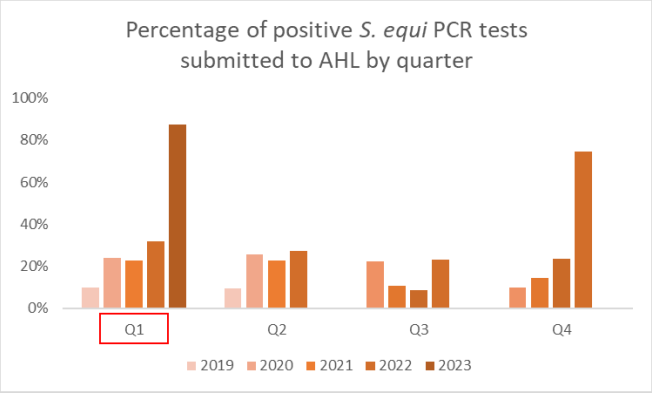
Syndromic and AHL Laboratory Data Surveillance Dashboard

Survey – Key points

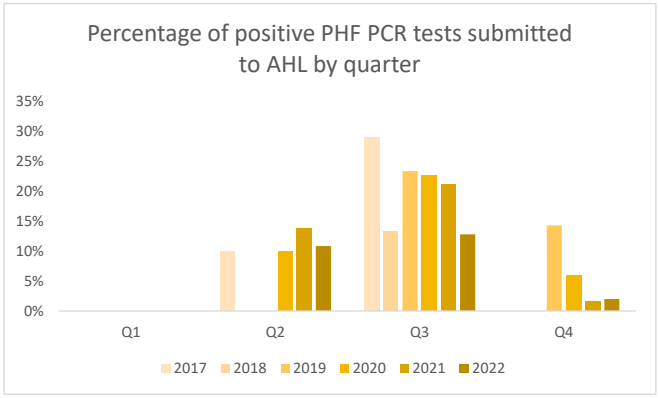
- 23 Counties represented
- 71% equine, 13% equine and food animal , and 8% equine and small animal clinics responded; the remainder were mixed animal and referral.
- Increase in (**foal**) colic, fever of unknown origin, septicemia, joint ill, wry nose and brachygnathia, hypothyroidism, ; (**adult**)

- New conditions or those without a diagnosis:
  - Bloody unilateral nasal discharge for 10 days with no findings on x-ray and scope. Persistent low WBC in a racehorse that is predictably linked to poor on-track performance, no other lab abnormalities, no improvement with treatment for EGUS or hindgut inflammation.
  - Several cases of riding horses with blocking pattern that suggested high suspensory but on MRI we found significant lesions in the carpus instead.
  - Recurrent abscesses at girth line on ventrum (horses are not ridden and do not wear any tack), They share a field but others in the field are not affected). Culture came back as *Corynebacterium ulcerans*. Cleared up with TMS and topical flushing/scrub but recurred two months later.
  - 15 year old pregnant mare went down in her last 2 months of gestation. Unable to rise and died within 48 hours. Herpesvirus negative PCR on blood sample.
  - Cystoliths : 3 horses (2 mares) without alfalfa diets
  - Fever related to colic signs.



There was a significant increase in the percent of positive *S. equi* PCRs in Q1 2023 versus Q1 2022 . The reporting of S.equi positive results, repeated testing to identify carriers as well as testing prior to moving horses to new facilities are contributing to the increase in the percent of positive tests.

No positive test results for PHF occurred in Q1 which is typical for the disease.



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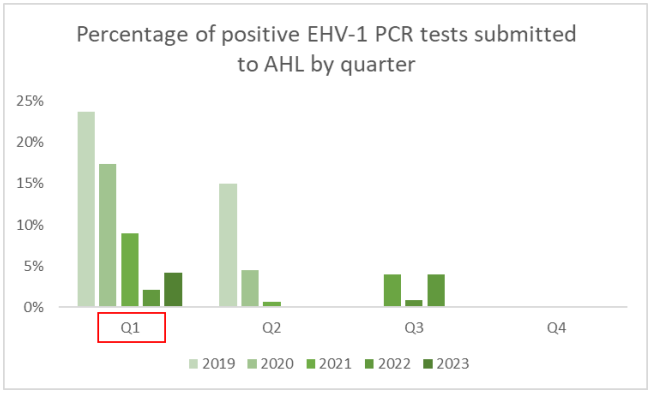
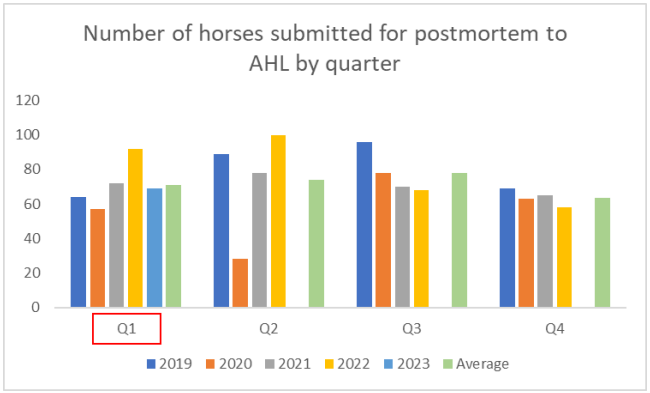
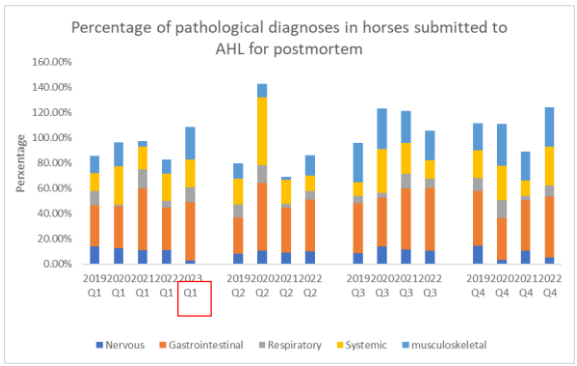
Syndromic and AHL Laboratory Data Surveillance Dashboard (Cont'd)



There were 8 positive tests for EHV-1 this quarter. Q1 is the most significant time for positive EHV-1 test results..

The number of horses submitted to AHL for postmortem in Q1 are slightly decreased to those of Q1 2022.





The number of nervous system diagnoses was significantly decreased compared to Q1 2022. Gastrointestinal , respiratory and musculoskeletal diagnoses were increased in Q1 compared to Q1 2022.

Look for the Q2 survey in July 2023
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!

Equine Research from Ontario and Around the World

Researchers in Ontario

Direct and culture-enriched 16S rRNA sequencing of cecal content of healthy **horses** and **horses** with typhlocolitis.Zakia LS, et al. PLoS One. 2023. PMID: 37053174 Free PMC article.

Effects of concentrated fecal microbiota transplant on the **equine** fecal microbiota after antibiotic-induced dysbiosis.Di Pietro R, et al. Can J Vet Res. 2023. PMID: 37020579

Effect of dietary iron supplementation on the **equine** fecal microbiome.Arantes JA, et al. Can J Vet Res. 2023. PMID: 37020575

Plasma and Synovial Fluid Cell-Free DNA Concentrations Following Induction of Osteoarthritis in **Horses**.Panizzi L, et al. Animals (Basel). 2023. PMID: 36978592 Free PMC article.

Equine alveolar macrophages and monocyte-derived macrophages respond differently to an inflammatory stimulus.Kang H, et al. PLoS One. 2023. PMID: 36920969 Free PMC article.

Delayed embryonic development or a long sperm survival in two mares-A registration conundrum.McCue PM, et al. Equine Vet J. 2023. PMID: 36917554

Effect of plasma transfusion on serum amyloid A concentration in healthy neonatal foals and foals with failure of transfer of passive immunity.Palmisano M, et al. J Vet Intern Med. 2023. PMID: 36825688 Free PMC article.

The influence of a probiotic/prebiotic supplement on microbial and metabolic parameters of **equine** cecal fluid or fecal slurry in vitro.MacNicol JL, et al. J Anim Sci. 2023. PMID: 36715114

The Global Seroprevalence of **Equine** Brucellosis: A Systematic Review and Meta-analysis Based on Publications From 1990 to 2022.Jokar M, et al. J Equine Vet Sci. 2023. PMID: 36649828 Review.

Researchers around the world

Immunotherapy of **Equine** Sarcoids-From Early Approaches to Innovative Vaccines.Jindra C, et al. Vaccines (Basel). 2023. PMID: 37112681 Review. Free article

Equine Gram-Negative Oral Microbiota: An Antimicrobial Resistances Watcher?Pimenta J, et al. Antibiotics (Basel). 2023. PMID: 37107153 Free article

Clinical Aspects of Bacterial Distribution and Antibiotic Resistance in the Reproductive System of Equids.Tyrnenopoulou P, et al. Antibiotics (Basel). 2023. PMID: 37107026 Review. Free article

Social Box: A New Housing System Increases Social Interactions among Stallions. Zollinger A, et al. Animals (Basel). 2023. PMID: 37106974 Free article

Ultrasound Morphometry and Mean Echogenicity of Digital Flexor Tendons, Suspensory Ligament, and Accessory Ligament of Digital Deep Flexor Tendon in Gaited **Horses**.Schade J, et al. Animals (Basel). 2023. PMID: 37106973 Free article

Effect of pentobarbital as a euthanasia agent on **equine** in vitro embryo production.Martin-Pelaez S, et al. Theriogenology. 2023. PMID: 37084499

Guide to diagnosing and managing skin diseases in **horses**.Long S. Vet Rec. 2023. PMID: 37084195 Review.

Serum nerve growth factor in **horses** with osteoarthritis-associated lameness.Kendall A, et al. J Vet Intern Med. 2023. PMID: 37083137 Free article.

Ocular findings in a population of geriatric equids in the United Kingdom.Chalder R, et al. Equine Vet J. 2023. PMID: 37070252

Occurrence and control of **equine** strongyle nematode infections in Prince Edward Island, Canada.Stoughton WB, et al. Vet Parasitol Reg Stud Reports. 2023. PMID: 37068859

Heat stress in **horses**: a literature review.Kang H, et al. Int J Biometeorol. 2023. PMID: 37060454 Review.

Detecting fatigue of sport **horses** with biomechanical gait features using inertial sensors.Darbandi H, et al. PLoS One. 2023. PMID: 37058516 Free PMC article.

Equine Gastric Ulcer Syndrome: An Update on Current Knowledge.Vokes J, et al. Animals (Basel). 2023. PMID: 37048517 Free PMC article.

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Asthma: The Use of Animal Models and Their Translational Utility.Woodrow JS, et al. Cells. 2023. PMID: 37048164 Free PMC article. Review.

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Evidence of intrathecally-derived antibodies against Toxoplasma gondii in **horses** suspected of neurological disease consistent with **equine** protozoal myeloencephalitis.Bernardino PN, et al. Vet Parasitol. 2023. PMID: 37043865 Free article.

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Antibiograms of field and hospital acquired **equine** neonatal bacterial fluid cultures in the Midwestern United States: 149 samples (2007-2018).Bookbinder LC, et al. J Vet Intern Med. 2023. PMID: 37029453 Free article.

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Hypertriglyceridemia in **equines** with refractory hyperinsulinemia treated with SGLT2 inhibitors.Kellon EM, et al. Open Vet J. 2023. PMID: 37026076 Free PMC article.

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A comparative survey of veterinarians, **equine** owners, and **equine** keepers regarding the knowledge and implementation of legal requirements in Germany for the use and documentation of veterinary medicines in **equines** intended for slaughter.Schneider ST, et al. PLoS One. 2023. PMID: 37023045 Free PMC article.

Administration safety of medical-grade honey (MGH) in septic synovial structures in **horses**: 3 cases.Terschuur JA, et al. Can J Vet Res. 2023. PMID: 37020573

Long-Term Training Increases Atrial Fibrillation Sustainability in Standardbred Racehorses.Carstensen H, et al. J Cardiovasc Transl Res. 2023. PMID: 37014465

Stress response as a contributing factor in **horses** with laminitis.Moss A, et al. J Vet Sci. 2023. PMID: 37012040 Free PMC article.

A Comparison of the Efficacy of Two Omeprazole Formulations in the Treatment of **Equine** Gastric Ulcer Syndrome in Racehorses: A Blinded, Randomized Clinical Trial.Busechian S, et al. J Equine Vet Sci. 2023. PMID: 37003396

Pharmacokinetics of aminocaproic acid in thoroughbred **horses**.Maxwell L, et al. J Vet Pharmacol Ther. 2023. PMID: 3699

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Dietary Supplementation with Boswellia serrata, Verbascum thapsus, and Curcuma longa in Show Jumping **Horses**: Effects on Serum Proteome, Antioxidant Status, and Anti-Inflammatory Gene Expression.Beghelli D, et al. Life (Basel). 2023. PMID: 36983904 Free PMC article.

Evaluation of Thermal Changes of the Sole Surface in **Horses** with Palmar Foot Pain: A Pilot Study.Zaha C, et al. Biology (Basel). 2023. PMID: 36979115 Free PMC article.

Breath Alcohol Test Results in **Equine** Veterinarians after Performing an Abdominal Ultrasound with Ethanol.Vitale V, et al. Vet Sci. 2023. PMID: 36977261 Free PMC article.

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