

# Merck Animal Health Equine Respiratory Update

IN COLLABORATION WITH THE UNIVERSITY OF CALIFORNIA, DAVIS SCHOOL OF VETERINARY MEDICINE

## Looking Back To What's Ahead

### *Case demographics as a 'crystal ball'?*

If there's one thing this profession (and pandemic) has taught us, it's reflection. Contemplating what we knew then; what we know now. Thinking about what's ahead and analyzing the data and experiences we've acquired to inform the decisions we make moving forward. Hindsight is 20/20, or so the saying goes.

There is not a crystal ball in veterinary medicine (or life) but we have amassed 12 years' worth of trending data to reflect upon and drive insights into seasonal infectious upper respiratory disease incidence. In this issue, we'll draw on the power of reflection to help practitioners anticipate disease challenges during the current fall and upcoming winter season.

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## EHV-4 Likely Disease Candidate this Fall and Winter

Reviewing the previous 12 months of program data (July 2019–June 2020), we see that equine herpesvirus type 4 (EHV-4) comprises a significant portion of disease cases, particularly in the October through December timeframe (Figure 1). EHV-4 cases October to December 2019 represented nearly half (47%) of all positive samples. In March 2020, we also saw a spike in EHV-4 cases.

Since the Biosurveillance Program began in 2008, EHV-4 represents 22% of positive samples in the month of October (Figure 2). This is the highest monthly incidence of any infectious upper respiratory disease over the course of the program’s 12-year history. The months of November and December are also in the double digits with 14% and 18% of positive EHV-4 cases, respectively.

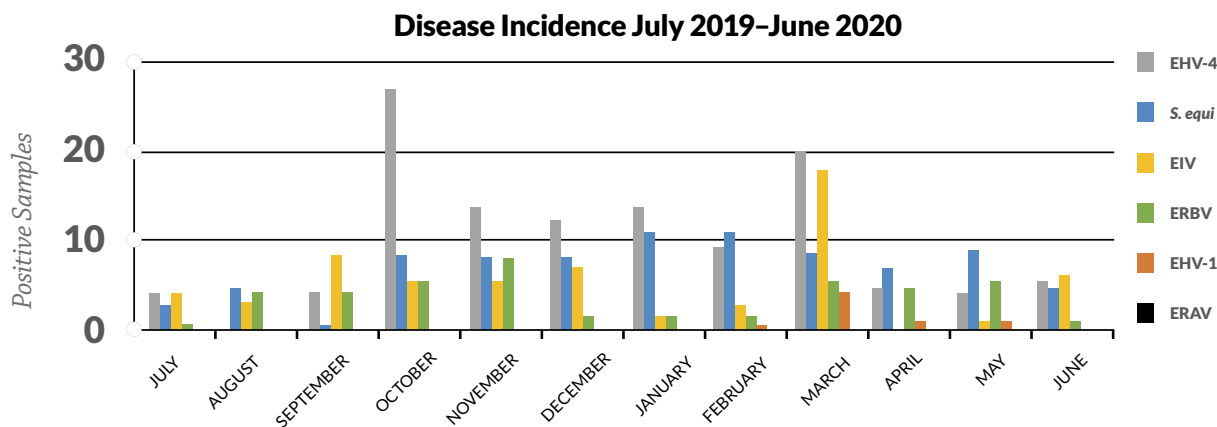


Figure 1: Twelve-Month Disease Trends July 2019 to June 2020. A total of 708 samples were submitted from July 2019 to June 2020. Overall, 44% of total samples submitted tested positive for one of the six primary pathogens (EHV-4, S. equi, EIV, ERBV, EHV-1, ERAV). EHV-4 was the most frequently diagnosed.<sup>1</sup>

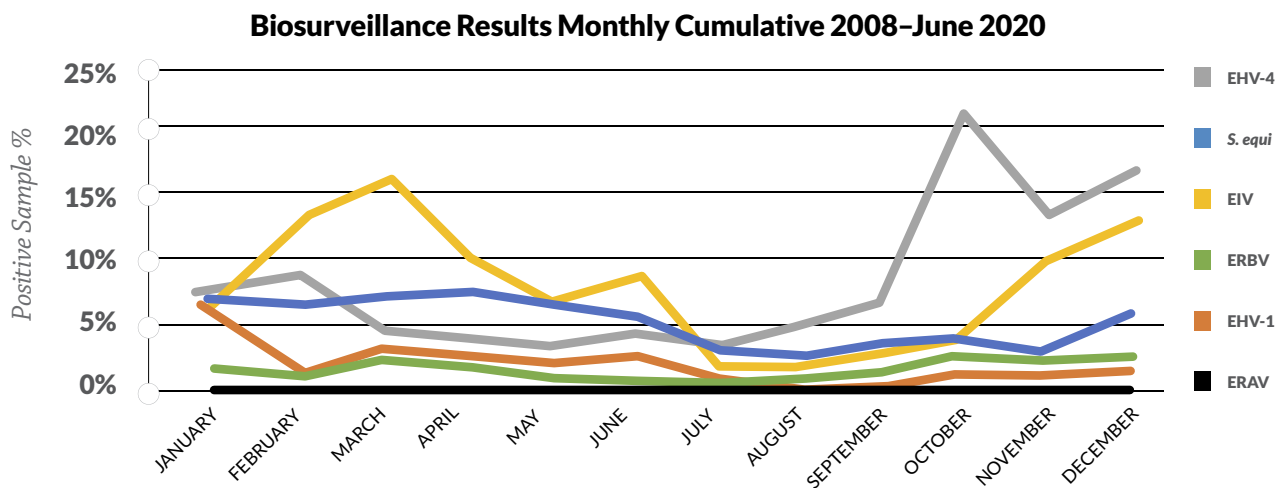


Figure 2: Seasonal Incidence of Equine Upper Respiratory Disease.<sup>1</sup>

<sup>1</sup>Merck Animal Health and University of California, Davis School of Veterinary Medicine (Nicola Pusterla). Infectious Upper Respiratory Disease Surveillance Program. Ongoing research 2008–present.

What do we know about EHV-4 that makes it so darn common in the fall months? For one, EHV-4 typically occurs in young horse populations—48% of cases during the October to December 2019 fall season were in horses 1 to 5 years of age. Additionally, fall often coincides with weaning, sales and travel for youngsters. It’s a transitional time of year, including shifting weather patterns—creating a confluence of factors for this and other highly contagious respiratory diseases in vulnerable horse populations.

Age of Horse	No. of Cases
<1 year	9
<b>1-5 years</b>	<b>57</b>
6-10 years	16
11-15 years	7
16-20 years	12
>20 years	5
<b>MEDIAN AGE = 3</b>	

Table 1: EHV-4 (+) Cases by Age July 2019–June 2020<sup>1</sup>

## Equine Flu Season Follows Closely Behind

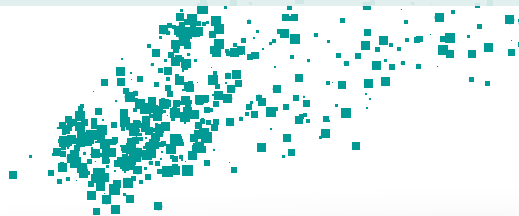
Biosurveillance data shows increased flu incidence beginning in December and running through April. The incidence of equine influenza virus (EIV) has been trending upward since 2008, showing considerable spikes in recent years.<sup>1</sup> Equine influenza was the most common infectious upper respiratory disease of the horse in 2019, with significant increases noted in February, March and again in June.<sup>1,2</sup>

A recently published study from the Biosurveillance Program documenting upper respiratory tract infections from March 2008 through February 2019 revealed several key considerations for EIV that may help veterinarians prepare for the upcoming winter season:

- **Season.** Peak EIV occurrence took place in the winter and spring months. (Figure 2, reflects 2008–June 2020 timeframe)
- **Clinical signs.** The most common signs associated with EIV were fever, nasal discharge and cough. Subclinical signs may occur in EIV-vaccinated horses.
- **Age.** Horses between 1 and 9 years old tested positive for EIV most often.
- **Use.** Competition horses accounted for 42.1% of positive EIV cases followed closely by pleasure horses at 37.9%.
- **Transport.** Horses with a history of recent transport were more likely to test positive for EIV.
- **Exposure.** Horses living on premises with multiple affected horses were more likely to also become infected.



*Through the Biosurveillance Program, we continue to monitor the antigenic drift of EIV. Hemagglutinin (HA) sequencing demonstrates the Florida '13 vaccine strain continues to align extremely well with circulating EIV strains in the field. Ask your Merck Animal Health Equine sales professional to share our recent EIV homology technical bulletin for more information.*



<sup>1</sup>Vaala W, Barnett DC, James K, Chappell D, Craig B, Gaughan E, Bain F, Barnum SM, Pusterla N. Prevalence Factors Associated with Equine Influenza Virus Infection in Equids with Upper Respiratory Tract Infection from 2008 to 2019. AAEP Proceedings. 2019 Vol 65.

## Importance of Herd Immunity

Less transportation and fewer equestrian events due to the COVID-19 pandemic has reduced the risk of infectious disease spread, but it's important to avoid a false sense of security. Pandemic or not, we continue to see a lot of infectious disease in non-traveling horses. Fifty-seven percent of EHV-4, *Streptococcus equi* subspecies *equi* (*S. equi*) and EIV positive cases during the July 2019 to June 2020 timeframe occurred in non-traveling horses. Fifty-nine percent of EHV-4 positive cases had not traveled within the previous 14 days (Table 2). It's important to note that, as with EHV-1, existence of a latent state seriously compromises efforts to control EHV-4 and explains why outbreaks of EHV-1 or EHV-4 can occur in closed populations of horses.

Herd immunity is best achieved by semi-annual EHV (types 1 and 4) and EIV vaccination,<sup>3</sup> whether horses are traveling or staying at home. While EHV-1/4 and EIV vaccines are unable to establish sterile immunity, they are of great benefit in reducing the severity of clinical signs and amount of viral shedding, hence reducing environmental contamination and reducing the risk of EHV and EIV disease spread. In addition, it's important to continue emphasizing the importance of biosecurity and isolation of traveling horses upon their return to the farm.

Demographic Summary	EHV-4 (112 cases)	<i>S. equi</i> (78 cases)	EIV (68 cases)
Median Age	3 years Range: 13 days – 36 years	8 years Range: 4 months – 27 years	4 years Range: 6 months – 24 years
Predominant Breed(s)	Quarter Horse; Thoroughbred	Quarter Horse	Quarter Horse
Travel	<b>No 59%</b> Yes 34% Unknown 7%	<b>No 60%</b> Yes 27% Unknown 13%	<b>No 50%</b> Yes 40% Unknown 10%
Primary Discipline	Show 47% Pleasure 33% Other/Unknown 20%	Pleasure 29% Show 46% Other/Unknown 24%	Pleasure 37% Show 43% Other/Unknown 21%

Table 2: Summary of primary demographic parameters for the three major pathogens (July 2019–June 2020).<sup>1</sup> At least 50% of horses testing positive for one of the three major pathogens had not traveled within the past 14 days. We continue to see a higher incidence of disease in non-traveling horses across the major respiratory pathogens. This reinforces the importance of including the resident herd that does not travel in vaccination programs.<sup>3</sup>

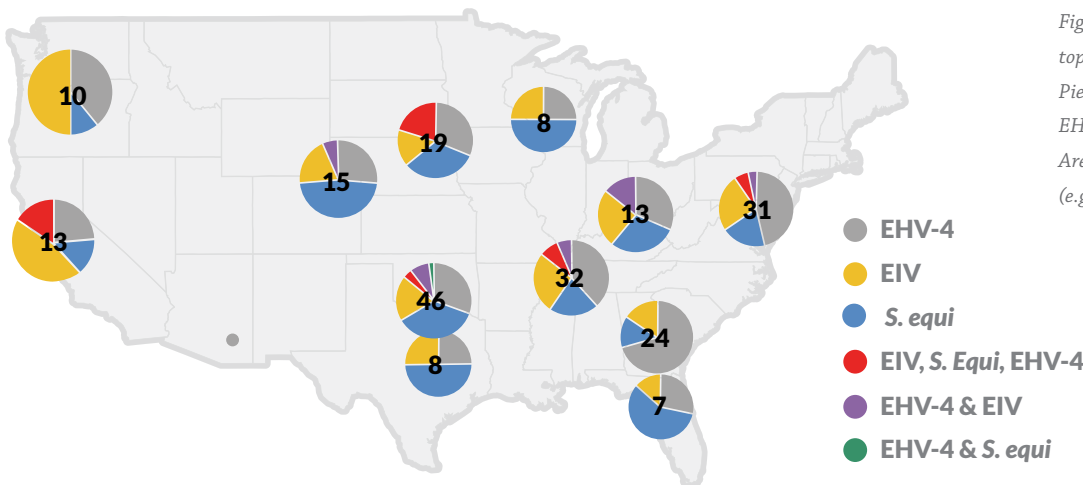


Figure 3: Geographic representation of the top three pathogens July 2019–June 2020.<sup>1</sup> Pie represents the proportion of total positive EHV-4, *S. equi* and EIV cases in an area. Areas of disease overlap are also represented (e.g. cases of EHV-4 and EIV).

<sup>3</sup>AAEP Risk-based Vaccination Guidelines (<https://aaep.org/guidelines/vaccination-guidelines/risk-based-vaccination-guidelines>)

## Case Signalment Matters

Each *Equine Respiratory Update* newsletter includes a summary of demographic parameters (signalment) for the primary disease pathogens (see Table 2). This important background information, including age, breed, use and travel patterns provides insight to support not only preventive and management measures, but also predilections to disease susceptibility in our horse population.

The future is still the future, but 12 years of data provides strong predictive analytics to help our industry stay on top of infectious upper respiratory disease. **So, please keep completing those respiratory surveillance questionnaires with your sample submissions!**

The image shows a screenshot of the 'Equine Respiratory Pathogen Surveillance Questionnaire' form. The form is divided into several sections:
 

- Signalment:** Fields for Name, Veterinarian's Clinic, Address, Email, Phone (Home/Work/Fax), Owner, Age, Sex, and Breed.
- Occupation:** A section with radio buttons for Racing, Show, Pleasure, Breeding, and Other.
- Sample Submitted:** A section with radio buttons for blood, nasal swab, and other.
- Vaccination History:** A table with columns for Disease, Vaccine product last used, Date vaccinated or time since last dose, and Number of doses given per year. Diseases listed include EHV 1&4, Influenza, and S. equi.
- Additional Questions:** Fields for 'How many days has the horse been showing signs prior to sampling?', 'Has the horse been transported during the past 14 days?', and 'How many other horses on the premises are showing signs?'.

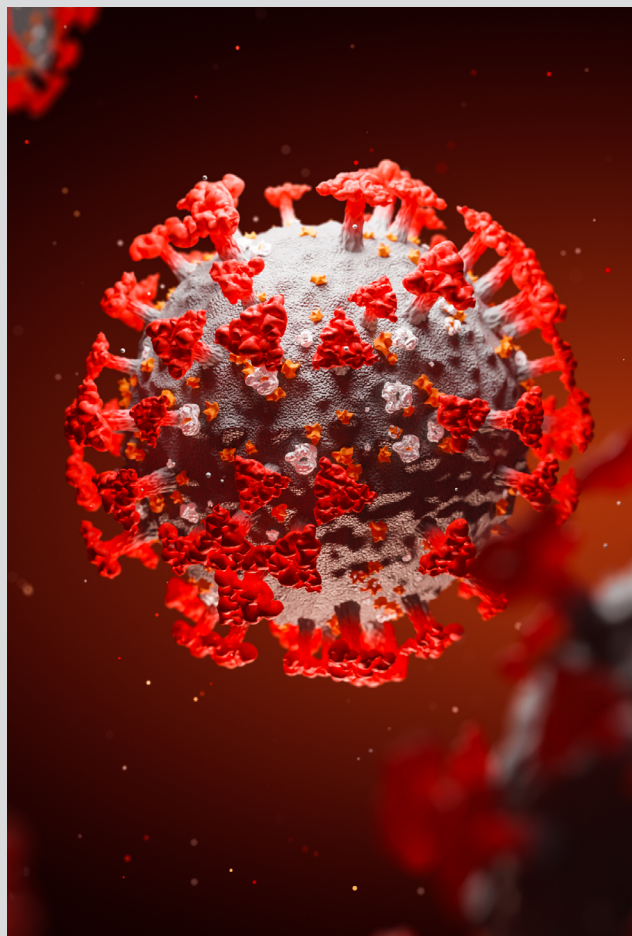
## Owner Tips

### COVID presents opportunity for wellness care conversations

The pandemic illustrates just how important biosurveillance and preventive medicine are to human and horse health alike. COVID-19 provides our equine veterinary profession a unique opportunity to discuss the foundational elements of disease prevention, especially vaccination and biosecurity. Horse owners may be more receptive now to learning how vaccinations work and why they're critical. Discussions about handwashing and respiratory transmission have become commonplace, so horse owners may also be more apt to implement basic biosecurity measures.

This notion is supported by data from a recent survey conducted by Amy Grice, VMD, MBA. More than half of equine veterinarians surveyed report their practice finances have not been impacted by COVID-19. Rather than horse owners seeking less veterinary care, the anecdotal evidence points to a shift from competition-related care to wellness care. (For complete survey results, see the Winter issue of *EquiManagement* magazine, coming out in early November 2020, or listen to Dr. Grice discuss highlights on the *EquiManagement* Disease Du Jour podcast, sponsored by Merck Animal Health.)

Our profession can seize this moment to remind horse owners that the need for disease prevention is ever-present and that performance and soundness checks are not a replacement for wellness exams. Delaying or skipping well care can be just as devastating as delaying sick care. All horses should be seen at least annually for preventive care, especially vaccinations. This is true for performance horses and recreational horses alike—pandemic or no pandemic.



## Practice Tip

### Nasal Swab Shortage

Please note, the UC Davis laboratory is currently experiencing a back order on nasal swabs. To manage current supply, only one swab (instead of two) will be sent with sample kits. Please reference proper sampling techniques (below), including importance of adequate contact time (allow swab to soak for 5 to 10 seconds, while gently rotating) to ensure a good sample.

#### Tips for improving quality of nasal swab samples

- **A synthetic swab with a plastic shaft is ideal.** Cotton contains pesticide and herbicide residues that act as inhibitors. It is also more difficult to extract cells from cotton. Remember to collect nasal secretions using two (when available), 6-inch rayon swabs.
- Any kind of organic material—such as dirt, especially during dry conditions—may also act as an inhibitor. If the nostril or swab looks dirty, you may need to clean the nostril and collect another sample.
- Sampling from one nostril is sufficient. Insert two swabs (when available) at one time. Remember to **allow swabs to soak for 5 to 10 seconds**, while gently rotating swabs.
- Nasopharyngeal swabs generally yield better results for EIV and *S. equi*, whereas there is no difference between nasal and nasopharyngeal collection technique in detecting EHV.
- To optimize the sensitivity of the testing procedures used, it is important to **sample only those horses that are symptomatic. Criteria for inclusion:**
  - a. **Unexplained fever ( $T \geq 101.5^{\circ}\text{F}$ ) AND one or more of the following signs: depression, nasal discharge, cough or acute onset of neurologic disease. Please refrain from sampling asymptomatic horses or chronic cases.** Unless indicated, a maximum of five samples (from symptomatic horses) per location is encouraged. *This service should be used as a diagnostic aid and not a screening tool.*

All samples should be labeled with date, name of horse and owner. **Also, please complete the sample submission form and questionnaire before submitting.** The information you submit with each sample is critical to helping our industry better understand and manage current and emerging infectious respiratory disease in the horse.



*I love the respiratory panel. It is such a great service for our clients and for us to diagnose fevers of unknown origin (FUOs). The panel screens for the major respiratory diseases and the turnaround time is usually very fast. Thank you!*

-Dr. Jen Reda,  
Southern Equine Service, Aiken, South Carolina

## About the Newsletter

This bi-annual newsletter is being sent to inform the reader about the information generated through the Biosurveillance Program. Merck Animal Health is passionate about this program and is providing this newsletter to customer veterinarians to help them stay up to date on the latest trends and historical information the study has yielded to date. Technical veterinary advice, interpretation and case management support will be provided by Merck Equine Veterinary Professional Services (Drs. Barnett, Vaala, Gaughan, Craig, Bain, Chappell and Schneider) and Nicola Pusterla, DVM, Department of Medicine and Epidemiology, UC Davis.

If you have questions about the program or **to request past issues of the newsletter**, please call our professional services team at (866) 349-3497, or email us at the addresses listed below.

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## Relevant Supporting Research

For more information on the latest respiratory disease published research from Merck Animal Health, click on the links below.

- 1) [“Prevalence Factors Associated with Equine Influenza Virus Infection in Equids with Upper Respiratory Tract Infection from 2008 to 2019.”](#)  
 Vaala W, Barnett DC, James K, Chappell D, Craig B, Gaughan E, Bain F, Barnum SM, Pusterla N. *AAEP Proceedings*. 2019 Vol 65.
- 2) [“Prevalence Factors Associated with EHV-2/5 Among Equines with Signs of Upper Respiratory Infection in the US.”](#)  
 James, K., Vaala, W., Chappell, D., Barnett, D.C., Gaughan, E., Craig, B., Bain, F., Pusterla, N. *ACVIM* 2017 Abstract.
- 3) [“Prevalence factors associated with equine herpesvirus type 1 infection in equids with upper respiratory tract infection and/or acute onset of neurological signs from 2008 to 2014”](#)  
 Pusterla, N., Mapes, S., Akana, N., Barnett, D.C., Mackenzie, C., Gaughan, E., Craig, B., Chappell, D., Vaala, W. *Vet Rec*. 2015; doi: 10.1136/vr.103424.
- 4) [“Voluntary Surveillance Program for Equine influenza Virus in the United States from 2010 to 2013”](#)  
 Pusterla, N., Kass, P.H., Mapes, S., Wademan, C., Akana, N., Barnett, D.C., Mackenzie, C., Vaala, W. *J Vet Intern Med* 2015; 29:417-422
- 5) [“Surveillance programme for important equine infectious respiratory pathogens in the USA”](#)  
 Pusterla, N., Kass, P.H., Mapes, S., Johnson, C., Barnett, D.C., Vaala, W., et. al. *Vet Rec*. 2011 July 2;169(1):12. doi: 0.1136/vr.d2157.
- 6) [“Voluntary surveillance program for important equine infectious respiratory pathogens in the United States”](#)  
 Pusterla, N., Kass, P.H., Mapes, S., Johnson, C., Barnett, D.C., Vaala, W., Gutierrez, C., et. al. *AAEP Proceedings* 2010.

## About the Program

Since March of 2008, Merck Animal Health has been conducting an ongoing, voluntary equine biosurveillance program to study the prevalence and epidemiology of relevant viral and bacterial respiratory pathogens. More than 9,400 samples from U.S. equids of all ages, genders and breeds presenting with fever and signs of acute upper respiratory disease and/or acute neurological disease have been collected since the study began. Samples are submitted by participating Merck Animal Health customer clinics and tested via quantitative PCR at the University of California, Davis School of Veterinary Medicine (UC Davis). **To be eligible for testing, horses must have an unexplained fever (T ≥ 101.5°F) AND one or more of the following signs: Depression, nasal discharge, cough, and/or acute onset of neurologic disease.** The results are then returned to the Merck Animal Health customer within 24 hours and provide invaluable diagnostic and treatment information.

## Four-Fold Purpose:

- 1) To provide a valuable diagnostic tool to participating Merck Animal Health customers to assist in obtaining an accurate and timely diagnosis during an acute respiratory disease outbreak so they can provide optimal treatment, quarantine and vaccination strategies to their clients and patients.
- 2) To provide the horse industry with a better understanding of the prevalence and epidemiology of these respiratory pathogens.
- 3) To identify and monitor the current circulating strains of major equine respiratory pathogens.
- 4) To evaluate the efficacy of current vaccination protocols.



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Healthier Animals