Fall 2025 | Volume 11 | No. 2

Merck Animal Health Equine Respiratory Update

In Collaboration with University of California, Davis School of Veterinary Medicine

Fall into Action with Biosurveillance

Equine respiratory surveillance empowers clinics on the frontline of infectious disease management

"He's just off, doc," your client says on a crisp Monday morning. "We've been on the road a lot this summer, hitting the circuit pretty hard. Maybe he just needs a few days' rest before we make the final fall push."

You turn your attention back to the horse, noting a slight dullness in the horse's eye, and begin the physical exam, already contemplating plausible causes of illness. A respiratory virus? The horse presents with a 102°F fever and slight nasal discharge. Yep, but let's make sure, because the clinical signs for viral and bacterial respiratory infections are often similar.

"Let's find out what's going on here," you calmly say to your anxious client. "I'm going to take a nasal swab and draw some blood for testing."

Fast-forward (about) 24 hours. EHV-4 diagnosis. Not ideal, but not unexpected. You call your client and confirm a treatment and isolation plan with her.

"It could have been worse. Thanks for getting back to me so quickly," she says right before you hang up.

Disease intel with a purpose

Every October through April, certain respiratory pathogens surge. Having the right intel matters. That's the beauty of the Respiratory Biosurveillance Program's 17+ years of data—it provides a wealth of insight to better understand the prevalence and epidemiology of major equine respiratory pathogens, such as EHV-4.

In fact, nearly 13,000 samples tell us that EHV-4 is the most common respiratory pathogen not just in the fall, but overall. (Equine influenza and *S. equi* are closing the gap.)

> ***"Anytime we have a horse with respiratory symptoms and a fever of unknown origin who has either traveled or been exposed to other horses, we submit for the Respiratory Biosurveillance Program testing."***
>
> - Dr. Essie Rogers
> Hess Equine Veterinary Services

The hypothetical case above demonstrates how a simple nasal swab can guide case management, protect barn mates and reinforce your clinic's reputation as a leader in preventive care. Whether it's providing regional prevalence trends or guiding urgent outbreak management, the Respiratory Biosurveillance Program provides rapid quantitative PCR testing for six infectious upper respiratory disease pathogens so you can manage the case in front of you confidently:

- Equine herpesvirus types 1 and 4 (EHV-1, EHV-4)
- Equine influenza virus (EIV)
- *Streptococcus equi* subspecies *equi* (strangles)
- Equine rhinitis A/B viruses (ERAV/ERBV)

Thank you to the hundreds of veterinarians who are part of this program, and who have submitted samples to help us build a massive repository of data that benefits the health of the horse. Without you, this program wouldn't be what it is today: the largest contemporary equine biosurveillance data set in the United States. You're making a significant difference in the industry's understanding of infectious upper respiratory disease and, most important, the lives of horses. Please keep the samples coming!

Ready, set, sample

New to the program? Been a while since you've submitted a sample? Just want to learn more? Now is the time to contact your Merck Animal Health representative for further details or to schedule an in-clinic refresher.

In the meantime, read on for the latest six-month disease trends and Biosurveillance Program FAQs to help reacquaint (or introduce) you to the program.

"The timely turnaround is fantastic for us to make early decisions about releasing isolation or completely locking down a facility. We can then make better recommendations to mitigate further disease spread based on the identification of the pathogen. This—combined with guidance from the Merck technical service veterinarian—helps us to develop strategies with the farm managers to prevent future disease outbreaks, from timely vaccination strategies to proper quarantine, isolation and biosecurity protocols."

- Dr. Essie Rogers
Hess Equine Veterinary Services

Respiratory Biosurveillance Program FAQs

What is the Biosurveillance Program?

Merck Animal Health's Biosurveillance Program has been helping veterinarians across the U.S. more effectively and efficiently diagnose and treat respiratory disease since 2008. The program is a diagnostic service based on the "sentinel" case concept, whereby veterinarians in the field identify one or more active cases of infectious upper respiratory disease. Rapid test results help veterinarians provide their clients with real-time identification and control of important infectious respiratory diseases and help us (as an industry) better understand a current and active presence of respiratory disease.

Why was the program developed and why is it unique?

Infections of the upper respiratory tract are among the most common clinical issues encountered by equine veterinarians. The challenging and elusive properties of these respiratory infections underscore the importance of ongoing surveillance to monitor emerging trends, manage outbreaks and improve preventive strategies. This study is perhaps most unique due to the large sample size and geographic distribution and its focus on a well-characterized set of respiratory pathogens. It is the largest contemporary biosurveillance data set in the United States.

How is the data used that is collected through the program?

Data collected in a well-designed sentinel system, such as the Biosurveillance Program, can be used to signal trends, identify outbreaks and monitor the disease burden in a community, providing a rapid, economical alternative to other surveillance methods. Twice a year, we report disease trends and updates in this biannual newsletter. Data from the program also is frequently published through peer-reviewed publications and presented at industry events as a service to the equine community at large.

What are the eligibility requirements for testing?

To qualify for testing, horses must have an unexplained fever (T ≥ 101.5°F) AND one or more of the following. Please refrain from sampling asymptomatic horses or chronic cases.

- Nasal discharge
- Cough
- Lethargy

How are samples submitted?

Submissions are quick and easy. Using the provided diagnostic kit, simply collect two nasal swabs and a purple top blood sample, complete the respiratory surveillance submission form and then ship to the UC Davis Equine Infectious Disease Research Laboratory (prepaid shipping). Results are received by the clinic within 24 hours of laboratory receipt.

Equine Respiratory Biosurveillance Program

At-a-Glance

Ongoing program since **2008**

LARGEST contemporary equine biosurveillance data set in the United States

nearly **13,000 samples** collected, representing more than 44 states

MONITORS

6 infectious upper respiratory disease pathogens:

- Equine herpesvirus types 1 and 4 (EHV-1, EHV-4)
- Equine influenza virus (EIV)
- *Streptococcus equi* subspecies *equi* (strangles)
- Equine rhinitis A/B viruses (ERAV/ERBV)

24-hour diagnostic turnaround through UC Davis Equine Infectious Disease Research Laboratory

THIRTEEN published research papers

More than a **DOZEN** national and international abstract presentations

What is the Respiratory Surveillance Submission Form?

The submission form is the most important piece of the process as this records patient information, including signalment, clinical signs, vaccination status and recent travel history. A complete patient history ensures timely release of test results and enables us to provide you with even more detailed information about how to improve management strategies to better protect the health of horses in your care. There is tremendous value in performing retrospective analysis and data mining with this information, but it is only as valuable as the ability to link it with laboratory results.

What if the horse was not vaccinated with a Merck Animal Health vaccine? Can I submit a sample?

Absolutely! Vaccine type or vaccination status does not preclude participation in the program.

How is client and patient information being protected?

All information submitted through the program is kept confidential. Raw data is stored on secure servers and accessed only by authorized personnel at Merck Animal Health and UC Davis. Reporting is done in aggregate only. Newsletter and program updates include overall case counts and trend graphs. Specific locations of cases are not revealed, nor are patient, clinic or client details.

I'm not sure if my clinic is part of the program. How do I find out?

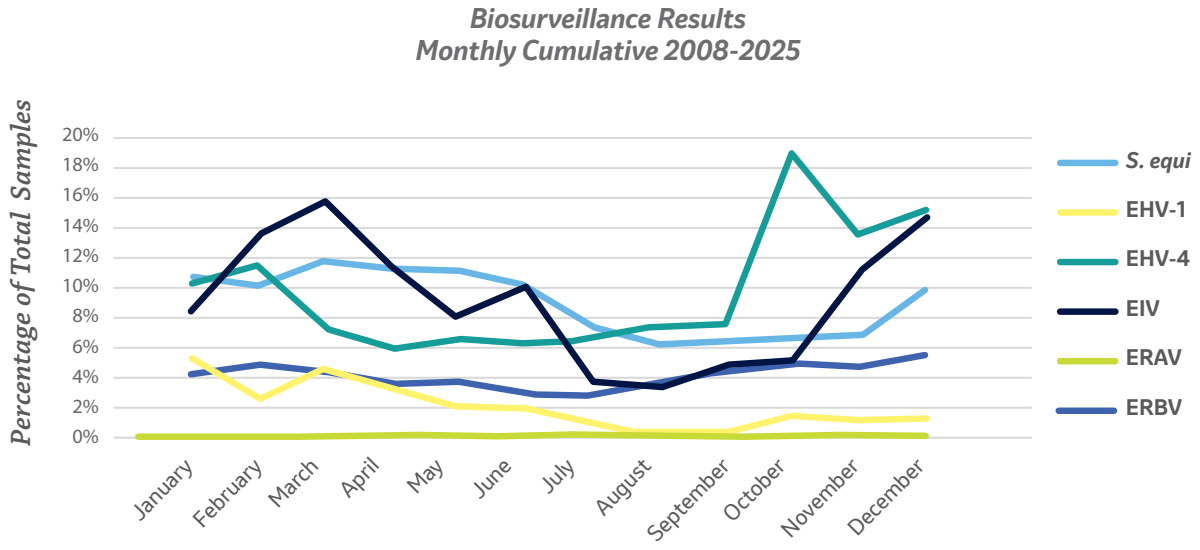
Contact your Merck Animal Health sales representative or a veterinary professional services team member at 1-866-349-3497 or USEquinePV@merck.com.

Equine Respiratory Biosurveillance Program

Key Program Findings[1]

- **EHV-4 and EIV are the most prevalent infectious upper respiratory pathogens**
- **Documented important influenza antigenic drift**
- **Birthplace of Florida '13 influenza vaccine strain isolate**
- **Age does not define susceptibility to certain infectious respiratory disease pathogens**
- **Travel is a significant risk factor**
- **A definite seasonality to disease outbreaks is present**
- **Similar clinical signs between viral and bacterial respiratory infections underscore importance of testing to confirm disease cause and proper management**
- **Biosecurity plus vaccination offers the best protection**

FIGURE 1: Seasonal Incidence of Equine Infectious Upper Respiratory Disease[1]



The monthly cumulative graph depicts the seasonal effect of respiratory pathogens spanning 17+ years of surveillance. EHV-4 continues to be more prevalent in the fall months, in contrast to the other respiratory pathogens (especially EIV) that are more prevalent in the winter and spring months.

[1] Merck Animal Health and University of California, Davis (Nicola Pusterla). Infectious Upper Respiratory Disease Surveillance Program. Ongoing research 2008–present.

Current Six-Month Update

A total of 269 samples were submitted from January to June 2025. Overall, 36% of total samples submitted tested positive for one of the six primary pathogens (*S. equi*, EIV, EHV-4, ERBV, ERAV, EHV-1). During this timeframe, *S. equi* and ERBV were the most prevalent upper respiratory diseases reported, followed closely by EHV-4 and EIV.

FIGURE 2: Disease Incidence January to June 2025[1]

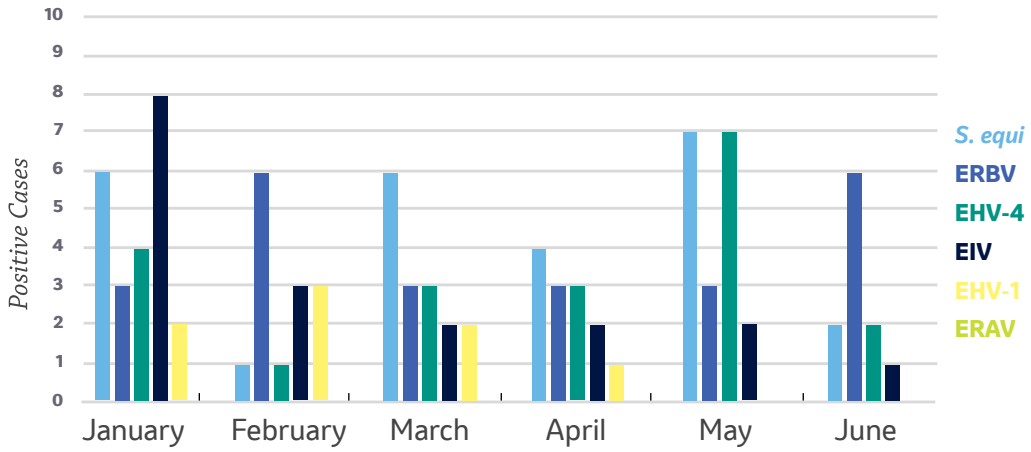


TABLE 1: Primary Demographic Parameters for the Four Major Pathogens (January to June 2025).[1]

Demographic Summary	*S. equi* (26 cases)	ERBV (24 cases)	EHV-4 (20 cases)	EIV (18 cases)
Median Age	**8 years** Range: 3 weeks – 25 years	**3.5 years** Range: 2 months–25 years	**3 years** Range: 3 months – 26 years	**5 years** Range: 1-15 years
Predominant Breed(s)	**Quarter Horse**	Quarter Horse, Thoroughbred	**Quarter Horse**	**Quarter Horse**
Travel	Yes 19% **No 62%** Unknown 19%	Yes 25% **No 58%** Unknown 17%	Yes 30% **No 65%** Unknown 5%	**Yes 50%** No 39% Unknown 11%
Primary Discipline	**Show 46%** Pleasure 27% Other/Unknown 27%	Show 29% Pleasure 29% **Other/Unknown 42%**	**Show 50%** Pleasure 25% Other/Unknown 25%	**Show 50%** Pleasure 33% Other/Unknown 17%

Clinic Spotlight: Bella Vista Equine on the value of the Biosurveillance Program

Participation: 10 years

How they use it: For horses with unknown fevers and as a diagnostic tool for sick horses

Top benefits:

- Free PCR testing
- Ease of collection
- Comprehensive results with quick turnaround

In their words:

"The program is fantastic and very easy to use!"

"It helps us manage outbreaks quickly and efficiently. We want to continue to use it as long as the program is available."

Bella Vista Equine is a primarily ambulatory practice with seven veterinarians who serve the greater Columbus, Ohio area.

About the Newsletter

This biannual newsletter provides information generated through and related to the Biosurveillance Program. Driven by an Unconditional commitment to the horse and those who serve them, Merck Animal Health is providing this newsletter to veterinarians to help them stay up to date on the latest trends and historical information the study has yielded to date. Merck Animal Health Equine Veterinary Professional Services and Nicola Pusterla, DVM, PhD, DACVIM, AVDC-Equine, UC Davis, will provide technical veterinary advice, interpretation and case management support.

If you have questions about the program please call our team at (866) 349-3497, or email us at the addresses listed below. For more information and to access past issues of the newsletter, visit www.Merck-Animal-Health-USA.com.

Dr. Bryant Craig
bryant.craig@merck.com

Dr. Cara Wright
cara.wright@merck.com

Dr. Duane E. Chappell
duane.chappell@merck.com

Dr. Philip van Harreveld
philip.van.harreveld@merck.com

Dr. Chrissie Pariseau
chrissie.pariseau@merck.com

Dr. Nicola Pusterla
npusterla@ucdavis.edu

Relevant Supporting Research

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

1. Investigation of Selected Prevalence Factors Associated with EHV-2 and/or EHV-5 Infection in Horses with Acute Onset of Fever and Respiratory Signs James K, Chappell DE, Craig B, Pariseau C, Wright C, van Harreveld P, Barnum S, Pusterla N. Viruses 2025, 17, 612. https://doi.org/10.3390/v17050612.
2. Investigation of the Frequency and Selected Prevalence Factors of EHV-4 Viremia in Horses with Acute Onset of Fever and Respiratory Signs Pusterla N, Barnum S, Lawton K, Craig B, James K. (2024) Proceedings of the American Association of Equine Practitioners, 70, 325-326.
3. Characterization of Equine Rhinitis B Virus Infection in Clinically Ill Horses in the United States during the Period 2012-2023 Schneider C; James K, Craig BW; Chappell DE; Vaala W; van Harreveld PD; Wright CA; Barnum S; Pusterla N. *Pathogens* 2023, 12, 1324. https://doi.org/10.3390/pathogens12111324
4. Voluntary Biosurveillance of *Streptococcus equi Subsp. equi* in Nasal Secretions of 9409 Equids with Upper Airway Infection in the USA. Jaramillo-Morales, C.; James, K.; Barnum, S.; Vaala, W.; Chappell, D.E.; Schneider, C.; Craig, B.; Bain, F.; Barnett, D.C.; Gaughan, E.; et al. *Vet. Sci.* 2023, 10, 78. https://doi.org/10.3390/vetsci10020078
5. Voluntary Surveillance Program for Equine Influenza Virus in the United States during 2008– 2021. Chappell DE, Barnett DC; James K; Craig B; Bain F; Gaughan E; Schneider C; Vaala W; Barnum SM; Pusterla N. *Pathogens* 2023, 12, 192. https://doi.org/10.3390/pathogens12020192
6. Voluntary Surveillance Program for Equine Influenza Virus in the United States During 2008-2021. Chappell DE, Barnett DC, James K, Craig B, Bain F, Gaughan E, Schneider C, Vaala W, Barnum SM, Pusterla N. *AAEP Proceedings*, 2022, Vol. 68.
7. Frequency of Detection and Prevalence Factors Associated with Common Respiratory Pathogens in Equids with Acute Onset of Fever and/or Respiratory Signs (2008-2021). Pusterla N; James K; Barnum S; Bain F; Barnett DC; Chappell DE; Gaughan E; Craig B; Schneider C; Vaala W. *Pathogens* 2022, 11, 759. https://doi.org/10.3390/pathogens11070759
8. 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.
9. Prevalence Factors Associated with EHV-2/5 Among Equines with Signs of Upper Respiratory Infection in the US. James K, Vaala W, Chappell DE, Barnett DC, Gaughan E, Craig B, Bain F, Pusterla N. ACVIM 2017 abstract.
10. 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 DC, Mackenzie C, Gaughan E, Craig B, Chappell D, Vaala W. *Vet Rec.* 2015; doi: 10.1136/vr.103424.
11. Voluntary Surveillance Program for Equine Influenza Virus in the United States from 2010 to 2013 Pusterla N, Kass PH, Mapes S, Wademan C, Akana N, Barnett DC, Mackenzie C, Vaala W. *J Vet Intern Med* 2015; 29:417-422.
12. Surveillance programme for important equine infectious respiratory pathogens in the USA Pusterla N, Kass PH, Mapes S, Johnson C, Barnett DC, Vaala W, et. al. Vet Rec. 2011 July 2;169(1):12. doi: 0.1136/vr.d2157.
13. Voluntary surveillance program for important equine infectious respiratory pathogens in the United States Pusterla N, Kass PH, Mapes S, Johnson C, Barnett DC, Vaala W, Gutierrez C, et. al. AAEP Proceedings 2010.

About the Biosurveillance 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. Nearly 12,850 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: Nasal discharge, cough and/or lethargy.** The results are returned to the Merck Animal Health customer within 24 hours of laboratory receipt of sample 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 recommendations 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.

UCDAVIS VETERINARY MEDICINE

MERCK Animal Health