

When a Healthy Foal Suddenly Becomes Critically Ill

Understanding R. equi Infections

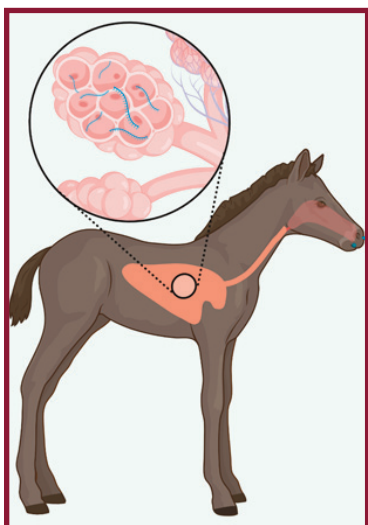
For anyone who breeds or raises horses, few things are more frightening than watching a seemingly healthy foal suddenly struggle to breathe.



That was the experience of one breeder whose three-month-old colt had been thriving until he developed severe respiratory distress. A lung scan revealed *Rhodococcus equi* (*R. equi*) pneumonia, and within hours, the foal went from appearing healthy to requiring hospitalization and intensive care.

R. equi can be particularly challenging because the infection may develop quietly in the lungs before obvious signs appear. By the time a foal shows symptoms such as fever, coughing, lethargy, nasal discharge, or difficulty breathing, significant lung abscesses and inflammation may already be present.

For this colt, the situation became life-threatening. His treatment included oxygen support and aggressive therapy to address both the underlying infection and the severe inflammatory response occurring in his lungs. Once stable enough to leave the hospital, he still required weeks of around-the-clock care, medications, repeated bloodwork, and lung scans.



Fortunately, he fought hard. By the end of June, his bloodwork indicated that he might finally be ready to discontinue medication, with the hope that his next assignment would simply be returning to his paddock and behaving like a normal young horse again.

His story is an important reminder for every horse owner — not only those involved in racing or breeding. The horses we eventually ride, compete, and build partnerships with all begin as vulnerable young horses whose future can depend on diseases being recognized quickly and effective treatments being available when something goes wrong.

For breeders and foal owners, understanding *R. equi* and recognizing its potential warning signs can be especially important. A foal that looked perfectly healthy yesterday may need veterinary attention today.

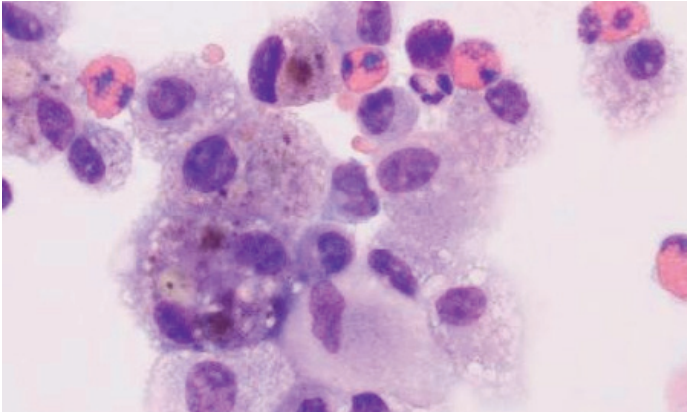
And when that happens, early recognition, skilled veterinary care, and the knowledge gained from years of studying diseases like *R. equi* can give that foal something invaluable: the opportunity to grow up.

Understanding How Horses Fight *R. equi* Infections

Every year, *R. equi* infections pose a serious threat to the health of foals, causing pneumonia that can be difficult and costly to treat. While veterinarians have made significant advances in managing the disease, important questions remain about how a horse's immune system naturally recognizes and fights this infection. A new research project aims to answer those questions and lay the groundwork for better vaccines and treatments.

Researchers at Baylor College of Medicine and Texas A&M University, with support from the Grayson-Jockey Club Research Foundation, are working to better understand how horses' immune systems respond to *R. equi*. By applying cutting-edge technologies typically used in human health research, the team hopes to uncover critical information that could improve equine health for years to come.

The goal of the project is to identify exactly what the horse's immune system "sees" when infection occurs. When a horse is infected, its cells display tiny pieces of the bacteria on their surface as a signal that something is wrong. Special immune cells, called T cells, use these signals to detect infected cells and help eliminate the infection.



Using advanced laboratory technology, including highly sensitive mass spectrometry, researchers can identify these bacterial pieces and determine which parts of the bacterium trigger an immune response. This approach enables scientists to move beyond predictions and directly measure the bacterial targets that are most important to the horse's immune system.

To conduct the study, researchers will collect lung cells from several horses using a routine veterinary procedure called bronchoalveolar lavage. The cells will then be exposed to *R. equi* in a controlled laboratory setting. Scientists will isolate the bacterial fragments presented by the cells and

analyze them to determine which bacterial proteins they come from.



The result will be a detailed map of the bacterial targets most likely to be recognized by the horse's immune system.

This information could help guide the development of more effective vaccines and treatments for *R. equi* infections and improve our overall understanding of how horses respond to this important disease.

By combining innovative immunology research with equine medicine, this project seeks to unlock new insights into one of the industry's most significant infectious diseases, ultimately helping veterinarians, horse owners, and breeders better protect the health of future generations of horses.

Why *R. equi* Research Matters

For breeders and foal owners, *R. equi* can turn a healthy, thriving foal into a critically ill patient with little warning. In this breeder's case, a promising three-month-old colt appeared normal one day and was struggling to breathe the next. Lung scans revealed severe *R. equi* pneumonia, requiring hospitalization, oxygen support, intensive medications, and weeks of around-the-clock care. Even with aggressive treatment, his prognosis was initially guarded.

The experience illustrates why continued research into *R. equi* is so important. The disease can progress quietly before obvious clinical signs appear, and once severe pneumonia and inflammation develop, treatment can be lengthy, intensive, and costly.

For breeders, better ways to prevent, identify, and treat *R. equi* could mean recognizing disease earlier, improving outcomes, reducing the burden of treatment, and ultimately saving more foals.

As this breeder's experience demonstrates, research can feel distant — until it's your foal fighting for every breath.



Research update from Holly White,
Director of Development
Grayson-Jockey Club Research Foundation