

Why Pregnancies Fail— And How Research Is Changing The Answer

Two Different Challenges - Two Different Approaches

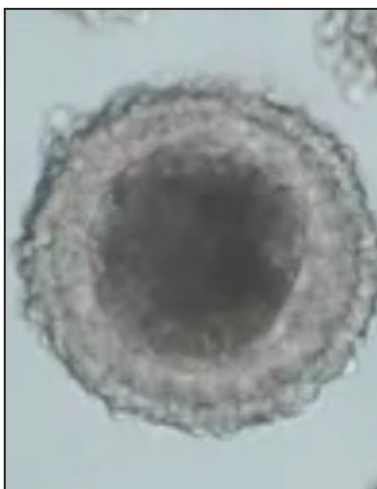
Pregnancy loss in mares is not one condition—it is most often the result of either early embryonic loss or placental disease. Each requires a different understanding, and increasingly, research is providing the answers. Early pregnancy loss is often a problem of the embryo. Placentitis is a disease of the placenta—and timing determines whether we can save the pregnancy.

Early pregnancy loss and placentitis represent two of the most significant—and very different—challenges in equine reproduction.

Early loss is often driven by genetic abnormalities within the embryo, making it largely unpreventable and shifting the focus toward understanding underlying causes. In contrast, placentitis is a disease of the placenta that can sometimes be managed if detected early, though intervention is often limited once clinical signs appear. Grayson-funded research is advancing critical insights into both—uncovering the genetic drivers of early loss while improving early detection, diagnosis, and treatment strategies for placental disease—moving the industry closer to protecting more pregnancies and improving outcomes for mares and foals.

Early Loss: Often Unavoidable, Increasingly Understood
Genetics—not mismanagement—is often the reason a pregnancy doesn't continue.

Early pregnancy loss in mares—particularly within the first two months of gestation—remains one of the most common and frustrating challenges in equine reproduction. For breeders and veterinarians, the question is often the same: why did this happen? Too often, the answer has been unclear, leaving limited options for diagnosis, prevention, or treatment.



Early Embryo

UNLOCKING LOSS

Understanding early pregnancy loss in horses

PROBLEM

80% of early pregnancy losses remain unexplained, impacting breeding success significantly.



DISCOVERY

20% of early losses are due to chromosomal abnormalities, affecting breeding outcomes.

RELEVANCE

Human and horse genomes share a 60% chromosome match, enhancing research insights.



Today, that is beginning to change.

With support from the Grayson-Jockey Club Research Foundation, researchers are reshaping our understanding of early pregnancy loss—shifting the focus beyond the mare to include the biology of the embryo.

Looking Earlier: The Role of Genetics

At the Cornell University Baker Equine Institute, Dr. Amanda de Mestre is leading groundbreaking research into the genetic causes of early pregnancy loss. Her work examines the embryo itself, identifying chromosomal abnormalities—such as gains, losses, or complete extra sets of chromosomes (triploidy)—that make pregnancies nonviable.

This research is redefining how veterinarians approach early loss. By determining how frequently these abnormalities occur and identifying associated risk factors, the foundation for earlier diagnosis and more informed breeding decisions is laid.

Placentitis: Where Timing Is Everything

While genetic abnormalities play a critical role early in gestation, placentitis remains one of the leading causes of later-term pregnancy loss.

Often, by the time caretakers detect a problem, it is too late to save the foal.



Researchers, including Dr. Margo Macpherson, professor emeritus at the University of Florida's College of Veterinary Medicine, have long worked to better understand and combat this disease. Building on that foundation, Dr. Pouya Dini at the University of California, Davis is advancing research into how infection, inflammation, and placental dysfunction combine to compromise fetal health.

Key findings show that placentitis:

- Disrupts the delivery of oxygen and nutrients to the fetus
- Triggers inflammatory and hypoxic responses
- Alters normal placental function at the molecular level

Innovative tools, such as lab-grown placental organoid models, are enabling researchers to study infection pathways and test therapies more efficiently than ever before. Grayson-funded research has also transformed understanding of nocardioform placentitis (NP), once believed to be caused by a narrow group of bacteria.

Today, researchers recognize that:

- NP involves a broader microbial environment, not a single pathogen
- NP develops differently from other forms of placentitis, often without early warning signs
- NP disrupts critical placental functions, limiting oxygen and nutrient transfer to the fetus

Molecular studies further show decreased blood vessel development alongside increased inflammation—conditions that can ultimately lead to pregnancy loss or compromised foals.

One of the greatest challenges in managing placentitis is timing. By the time clinical signs appear, intervention options are often limited. Grayson-funded research is helping change that by identifying early molecular and microbial markers, advancing diagnostic tools for earlier detection, and supporting the development of targeted therapies.

Why This Matters

Every lost pregnancy represents more than disappointment—it reveals a gap in knowledge, but science is working to close those gaps.

By advancing research at the genetic and placental levels, Grayson is helping move equine reproductive medicine from uncertainty to understanding—and from reactive care to proactive prevention. Because when we understand why pregnancies fail, we gain the knowledge to protect them.



*Research update from Holly White, Director of Development
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