

Anemia in Horses

by


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Introduction

ANEMIA in horses is rarely discussed outside of racing circles, but is an insidious condition with significant impact on a horse's health and performance ability. In this five chapter e-book, we provide a comprehensive look at equine anemia: what anemia is and how it affects horses, what causes equine anemia, signs and symptoms, ulcers and anemia, and treatments.

This content originally appeared as a series of blog articles on www.succeed-equine.com.

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What is Equine Anemia?

ANEMIA in horses simply refers to a reduction in red blood cells. Because one primary function of red blood cells is to deliver oxygen throughout the body, maintaining appropriate levels is critical to a horse's ability to perform — especially in disciplines that require endurance and stamina. Metabolism — the production of energy needed for performance — is much more efficient when oxygen is available. Racing or reining, endurance or jumping, one surefire way to improve your horse's performance is to increase oxygenation.



In addition to the performance impact, it's also critical to understand that anemia in horses is always a sign that something is going wrong in a horse's body. Equine anemia is the symptom of an underlying disease that needs to be diagnosed and treated.

Identifying Equine Anemia

Medically speaking, anemia is defined as a reduction below normal in the concentration of hemoglobin in the blood measured by volume of packed red cells per 100 mL of blood. It occurs when the equilibrium is disturbed between blood loss and blood production.

In layman's terms, anemia is a lack of hemoglobin (or red blood cells) in the blood that results from either losing blood, not making enough blood, or some combination of both.

Red blood cell levels are commonly measured by packed cell volume (PCV), also known as hematocrit, and represented as a percentage. A blood sample is placed in a centrifuge and separated into its three parts: red blood cells, buffy coat, and plasma. A normal PCV for horses can range from 32%-48%. Therefore, a PCV below 30% typically indicates that the horse may be anemic.

The Dangers of Low-Grade Anemia

You may be inclined to think that red blood cell levels need to drop significantly before they cause a problem for your horse.

But the truth is that even low-grade anemia — levels hovering around that 30% range on a PCV — can impact your horse physically and may indicate a health problem. This is especially true for high performance athletes. The greater your horse's physical condition and demand, the higher on the range of normal her red blood cell counts will typically be. Therefore, a red blood cell level low on the normal range or just below may indicate a concern for a racehorse, for example, where it wouldn't for that pasture pet.

Anemia in Horses Always Indicates a Health Problem

Say your veterinarian runs a blood panel on your horse, and the results of the PCV indicate that your horse is anemic. It's easy to stop there and simply take steps to treat the anemia. But anemia is never an issue unto itself. It's a symptom of a condition that is causing a horse to lose blood somewhere, to not produce enough blood, or that is destroying blood. And this condition is certainly impacting the horse's health in additional ways.

It's critical to work with your veterinarian to find the cause behind the anemia and treat it as well.

Equine anemia is the symptom of an underlying disease that needs to be diagnosed and treated.

How Anemia Impacts Your Horse

When a horse is anemic, it is suffering from a lack of red blood cells whose main responsibility is ferrying oxygen around the body. For performance horses, this lack of oxygen to the muscles is especially damaging. It reduces both the horse's energy and recovery ability — both of which make a huge difference in competition.

Anemia makes your horse lethargic and perhaps even causes him to lose appetite and coat condition.

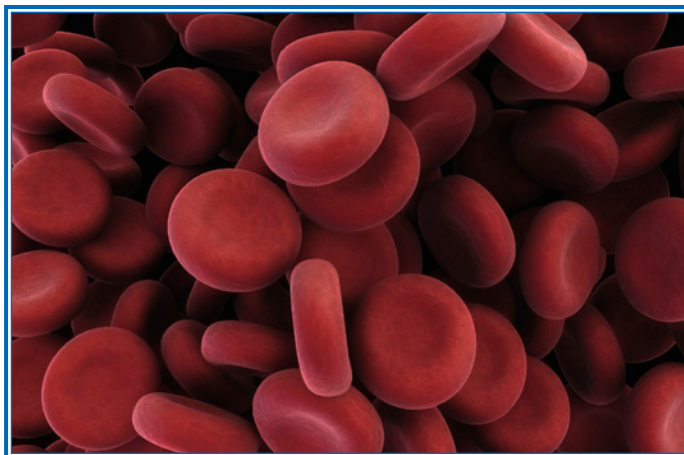
And these affects don't include any additional impact from the health condition that is causing the anemia in the first place.

If your horse is diagnosed with anemia, the critical thing is to understand what is causing the anemia. As we've pointed out, anemia can result from losing blood, not producing enough blood, or from the destruction of blood. Either way, the condition is a result of an underlying issue that should be explored.

Causes of Anemia in Horses

ANEMIA in general is a multi-faceted condition with various types and causes, and the same rings true for the anemic horse. Anemia is always a symptom of a larger health issue that needs to be identified and resolved. Once anemia is diagnosed, it's critical to continue working with your veterinarian to determine the type of anemia and the health problem that is causing it.

Anemia means that your horse has a decrease in red blood cell mass. One commonly used indicator is the packed cell volume (PCV), which measures percentage of red blood cells in a sample. The normal range for horses is for 32-48% of blood to be made up of red blood cells; horses with levels below 30% are typically considered anemic. Keep in mind that the level that indicates true anemia is somewhat subjective and varies from horse to horse.



Three Causes of Anemia in Horses

In the broadest terms, there are three causes of anemia in horses: blood loss, blood destruction, and reduced red blood cell production. Here's a closer look at each of these, and a sample of the conditions that can cause them.

Anemia Due to Blood Loss

Losing blood from an injury or health condition may put a horse at risk for anemia. When a horse loses blood, it loses red blood cells and plasma. The plasma is quickly topped off (a drink of water will do the trick), but the new red blood cells have to be created in the bone marrow — and that takes time.

Any type of internal or external bleeding could lead to anemia. It is generally classified as either acute (rapid onset) or chronic (persistent or long-lasting).

Causes of acute blood loss anemia include:

- traumatic injury
- ruptured blood vessels
- exercise-induced pulmonary hemorrhage
- perforated ulcer
- surgery

Causes of chronic blood loss anemia include:

- gastric and colonic ulceration
- parasites
- chronic inflammatory disease
- coagulation or platelet disorders



Once the cause of blood loss has been identified, treated, and resolved, red blood cell counts will generally return to normal within 2-6 weeks.

Blood loss anemia is by far the most common cause of anemia in horses. However, if your veterinarian rules out these potential causes, he or she will also consider anemia as a result of either blood destruction or lack of production.

Anemia Caused by Blood Destruction (Hemolytic Anemia)

Anemia in horses may also be caused by conditions that destroy blood, also known as hemolytic anemia or hemolysis. In hemolytic anemias, blood is destroyed faster than new red blood cells can be produced.

In the broadest terms, there are three causes of anemia in horses: blood loss, blood destruction, and reduced red blood cell production.

Most owners are familiar with Equine Infectious Anemia (EIA), which is what a Coggins test checks for. EIA is a viral disease that attacks the immune system, destroying blood in the process. Thanks to the use of the Coggins test, EIA is very rare (though not unheard-of) in the United States.

Other potential causes of hemolytic anemia include:

- parasites
- auto-immune disorders
- chronic infections
- septicemia
- toxins
- congenital red blood cell abnormalities

Anemia Caused by Reduced Red Blood Cell Production

If a horse's body isn't producing enough red blood cells, the result is obviously anemia. The most common cause of reduced red blood cell production is chronic inflammation. Chronic inflammation is commonly related to conditions such as abdominal or hoof abscesses, cellulitis, pneumonia, and peritonitis. This happens because the body sequesters iron, which is necessary for red blood cell production, away from the infected areas.

Other potential conditions that may reduce red blood cell production in horses include:

- bone marrow disease
- cancer
- kidney disease or failure
- nutritional deficiencies
- iron deficiency (extremely rare in horses)

This type of anemia is typically mild to moderate.

The underlying causes of anemia can be overwhelming, which is why it's crucial to allow your vet to dig deeper once anemia is detected. When the cause is identified and treated by your veterinarian, your horse's blood levels should eventually return to normal, and the anemia will resolve on its own.

Signs and Symptoms of Anemia in Horses

ANEMIA, a reduction in red blood cell mass, has the potential to significantly impact a horse's health and performance. In addition to the fact that it signals a more serious health problem, it can mean the difference in the hundredths of a second between first and second, the animation to score an 8 instead of a 7 on that movement, the impulsion to clear that highest rail.

While the symptoms of anemia in horses include a few clear health signals, it always needs to be diagnosed by a veterinarian through a blood test. There are two important concepts to keep in mind when considering whether or not your horse's symptoms point to anemia:

1. The symptoms of equine anemia can also signal a host of other health problems.
2. Anemia itself IS a symptom of an underlying, potentially serious, disease.

Here's a look at the direct, measurable impact anemia has on your horse's health and the importance of looking at anemia as a symptom itself.

Clinical Health Symptoms of Anemia in Horses

There are three clinical symptoms that anemic horses typically display:

1. **Pale mucous membranes.** Check the membranes around your horse's eyes and nose and its gums for a healthy pink color. Pale-colored membranes indicate something is wrong in your horse's body, and it could be anemia.
2. **Increased heart rate.** A reduction in red blood cells means that the horse's heart has to work harder to pump oxygenated blood around the body.
3. **Lethargy.** A horse that is anemic is going to be lackluster and low on energy. Red blood cells are responsible for delivering oxygen throughout the body. Too little oxygen affects the muscles as well as metabolism, which is responsible for turning food into energy.



Poor hair coat and loss of appetite may also result when a horse is anemic. While these three symptoms described above are classic signs of anemia, they can also signal a variety of other conditions as well. Fortunately, it's relatively simple for your vet to run blood tests to find out whether anemia may be causing the pale mucous membranes, lethargy, or loss of appetite — or if it's something else entirely.

Blood Tests that Indicate a Horse is Anemic

There are several types of blood tests your veterinarian can run to determine if your horse may be considered anemic. Anemia is a reduction in red blood cell mass that can be detected through a number of measures, including packed cell volume, red blood cell count or hemoglobin concentration. Let's look at each of these:



Packed Cell Volume

Packed Cell Volume (PCV), also known as a hematocrit, measures the percentage of red blood cells in blood and is the most common test for anemia. A blood sample is placed in a centrifuge and separated into its three parts: red blood cells, plasma and buffy coat (essentially the layer between blood cells and plasma that contains most of the white blood cells and platelets). A normal red blood cell range for horses on a PCV is between 32–48%. Lower than 30% may indicate anemia.

A PCV is generally run as part of a standard Complete Blood Count (CBC).

Anemia itself IS a symptom of an underlying, potentially serious, disease.

Red Blood Cell Count

The red blood cell count (RBC) is a measure of the number of circulating red blood cells in a given volume. It is typically expressed as millions of cells per microliter. A normal RBC count in horses ranges between 6.5–11.9.

Hemoglobin Concentration

Measuring the concentration of hemoglobin in a horse's blood is a test that is used only when hemolytic (blood destruction) anemia is suspected. Hemoglobin is a protein within red blood

cells that is responsible for carrying oxygen. It can be measured in a laboratory using an instrument called a hemoglobinometer. It is measured in grams/deciliter (or g/dl). The normal range for hemoglobin concentration in red blood cells for horses is 8-19 g/dl.

Interpreting Test Results

It's important to keep in mind that interpreting the results of one of these blood tests is subjective. The normal ranges used for each test are not set in stone; they simply express what is typical for most horses. Your veterinarian will use this information in tandem with other diagnostic testing, history, examination, and more, to determine if the results are indicative of anemia.



Also, it's important to keep in mind that "hot-blooded" and performance horses tend to naturally have a higher red blood cell mass than say a draft breed or leisure horse. As a result, a PCV around 30% may be normal for one horse, but could potentially indicate low-grade anemia in a performance horse.

Finally, horses store up to 30% of their red blood cells in the spleen. This highly oxygenated blood is then released any time the horse goes into "flight mode." Therefore, a horse just back from a hard work, galloping in from the pasture, or recovering from a spook will have an artificially high red blood cell mass on these tests. Therefore, it's important to be very careful about when you test and to perhaps test your horse's blood at several different times.

Anemia in Horses is a Symptom of Disease

While the symptoms discussed above are ways for you and a veterinarian to identify that a horse is anemic, it's critical to know that anemia itself is also a symptom. If a vet has confirmed anemia in your horse, this is only the beginning of the diagnostic process.

If your horse is suffering from a reduced red blood cell mass, it is also being impacted by a disease or condition that is further reducing its health and performance ability.

The most important thing to understand is that anemia itself is a sign and symptom for another disease. It's also crucial that you pay close attention to the ways your horse communicates that he's unhealthy or uncomfortable. Just like humans, your horse will do things that indicate a problem. And just like humans, your horse needs a vet to run check-ups and tests regularly to make sure that good health is being maintained.

Ulcers and Anemia in Horses

FOR years Freedom Health's staff veterinarian and primary researcher Franklin Pellegrini, DVM, along with many other veterinarians, noticed low-grade anemia plaguing performance horses. This was especially apparent in his work as both a veterinarian and trainer with thoroughbred and standardbred racehorses in Ohio. This observation started us on a research path that revealed alarming rates of gastric and colonic ulceration in horses at all performance levels.

One of the most common causes of anemia in horses is blood loss and, in turn, one of the most common conditions that results in chronic anemia from blood loss may be bleeding ulcers in the gut.

Here's a look at the link between equine ulcers and anemia, and why it's important to be more aware of your horse's digestive health.



Ulcers Found in More Than 60% of Horses

Many misconceptions exist about ulcers and horses. Some of the most widely held beliefs are that they only affect the horse's stomach (gastric ulcers), and they only plague high performance horses, horses that travel frequently, or horses that are nervous or stressed. Research shows these beliefs are erroneous and ulcers are a very real concern for the modern horse in general:

- A variety of published research papers show that over 80% of performance horses suffer from gastric ulcers, or ulceration of the stomach lining.
- In our own original post-mortem analysis published in 2005, we found the incidence of gastric ulceration in horses to be 88%.
- We also found that 63% of the horses studied had ulcers in the colon (hindgut).
- Thus, a full 97% of the horses had ulceration somewhere, and 54% had ulceration in both the stomach and colon.

In subsequent studies throughout recent years, we've found ulceration incidences to be even higher. Meanwhile, throughout the equestrian world, awareness of colonic ulceration is growing.

Why Anemia May Indicate GI Ulcers in Some Horses

Anemia is a reduction in red blood cell mass, and can be characterized by a low red blood cell count or low packed cell volume (a test that measures percentage of red blood cells). There are three different causes of anemia: loss of blood, destruction of blood, and not producing enough blood. By far the most common type of anemia in horses is related to a loss of blood, particularly blood loss due to chronic inflammation or disease.



Gastric and colonic ulcers are lesions in the sensitive lining of a horse's stomach or colon, respectively. Low-grade ulcers simply cause inflammation and reddening. They can progress from there to open wounds that bleed, continuously or intermittently, moderately or heavily. Because ulcers require intervention to treat, and rarely resolve on their own, they become a chronic problem for the horse when left unrecognized and unresolved.

There are three different causes of anemia: loss of blood, destruction of blood, and not producing enough blood.

This chronic, perhaps intermittent, bleeding in the GI tract from ulceration can result in enough blood loss that the horse becomes anemic. In addition to the health and performance problems caused by the ulcers, the reduction in red blood cells decreases the horse's ability to deliver oxygen throughout the body — impacting metabolism, muscles, and energy.

Additionally, blood test results that are on the lower end of the normal range may actually signal a problem in a performance horse. Horses that are in top performance condition tend to have higher red blood cell counts/percentages, therefore a normal but low result could actually indicate low-grade anemia. This could provide an early warning sign for ulcers in the performance horse.

If your vet diagnoses your horse with anemia based on symptoms and blood tests, the next step is to identify the underlying problem causing it. Because ulcers are so widespread and common among horses today, they are a logical place to begin with ongoing diagnostics.

Remember that while there is a link between anemia and ulceration in some horses, not all horses with ulcers are anemic.

Fecal Blood Testing to Identify Ulcers

Once a horse has been confirmed anemic, there is a simple and inexpensive fecal blood test your veterinarian can use to identify occult bleeding that may be occurring in the gastrointestinal tract.

The SUCCEED Equine Fecal Blood Test is used to identify trace amounts of albumin and hemoglobin, proteins found in blood, in a horse's feces. A positive result for only albumin indicates bleeding in the hindgut, while a positive result for only hemoglobin indicates bleeding in the stomach. A positive for both indicates the horse may be bleeding in both the fore and hind guts.

A positive result on the SUCCEED FBT may indicate that your horse is suffering from ulcers.

Your vet can confirm or rule out gastric ulcers with a scope, but colonic ulcers are impossible to confirm visually. Thus, a diagnosis of anemia combined with a positive fecal blood test provides a good indication that a horse could be suffering from colonic ulceration. This is especially helpful if the anemic horse has scoped clean for gastric ulcers.



Promote Your Horse's Digestive Health to Resolve Ulcers and Related Anemia

That horses are so prone to developing ulcers is a result of the demands on their bodies and digestive systems from travel, competition, and modern feed and care routines. In particular, undigested starch from cereal grains reaching the hindgut — which is designed to digest stemmy, fibrous foods — poses a major issue for gut health in horses across the board. It is known to cause both ulcers and colic.

In order to resolve ulcers and anemia, you need to work with your vet to first treat the ulcers and improve overall gut health. This can include:

- Treating gastric ulcers with omeprazole.
- Supporting the health of the hindgut.
- Reducing cereal grains in the diet and feeding more frequently in smaller amounts.
- Providing free access to quality hay or pasture grass.
- Feeding beet pulp instead of grain to boost calories.
- Use slow feeders or mix chaff with grain feeds to increase chewing time.

Once a horse's ulcers have healed and the bleeding stopped, the anemia will resolve on its own, assuming the ulcers are the sole cause of the anemia. If not, then additional diagnostics are in order, to determine what other factors may be contributing to the anemia. Either way, be aware that it takes the healthy equine body approximately 2–6 weeks to replenish red blood cells — and it doesn't require any additional help to do so.

Because ulcers can result in anemia, be sure to remain in dialogue with your vet about the importance of digestive health and ways to maintain the gut to prevent health issues in the future. Supplementation and better feed practices will not rule out anemia or ulcers completely, but if you are proactive about your horse's hind gut health the chances for larger health and performance issues can be reduced.

Treating Equine Anemia

SO your horse has been diagnosed with anemia. You finally have an answer for why its performance has been declining, it's lethargic, and it's losing that healthy glow. You are proactive and ready to get your horse healthy. But before you jump into some of the common treatments for anemia, you need to consider two things: are they really effective, and what are you doing to treat the underlying disease that is causing the anemia?

One of the big mistakes that many people make with an anemic horse is to simply try to treat the anemia. The problem is that the most common treatment methods have little effect and do nothing to resolve the real issue — whatever health condition is causing the anemia.

Here's a look at the two most common methods used with anemic horses and the importance of instead diagnosing and treating the underlying cause.



Why Supplementing to Treat Anemia is a Waste of Resources

The most common method used by many in an attempt to resolve equine anemia is supplementing with vitamins and minerals that are important to the process of red blood cell production. The two most widely used products are supplements that contain iron and/or Vitamin B12.

Both iron and B12 are necessary for the production of red blood cells. The theory is that increasing the availability of these in a horse's body will encourage increased red blood cell production and bring a horse's levels back to normal.

Supplementing with Iron to Treat Anemia in Horses

The problem with iron supplementation is that there is no research to support its use and no evidence that it is actually needed unless the horse is experiencing highly acute blood loss. While iron-deficiency anemia is somewhat common in humans,

iron-deficiency is extremely rare in horses. Because a lack of iron is almost never the cause of anemia in horses, supplementing with iron is not likely to resolve the issue.

Anemia in horses is much more commonly related to blood loss. Thus, even if supplementing with iron did actually support blood production, the underlying condition that is causing the blood loss remains untreated.

If, in spite of all of this, you still choose to supplement with iron, be aware that it's critical to use a product that also includes other metals, such as manganese, copper, and cobalt. Iron alone can do damage because it causes the horse's body to reject other minerals.

Once the underlying disease has been treated and resolved, the horse's red blood cells levels will return to normal on their own with no additional treatment necessary.

Supplementing with B12 to Treat Anemia in Horses

Another common product used to treat anemia in horses is Vitamin B12, which is also necessary for the production of red blood cells. While B12 won't hurt a horse, it may not do much good either.

B12 is a natural byproduct created by the bacteria in a horse's hindgut as they work to digest fibrous food. Because it's created naturally in the horse's body, supplementing with B12 is generally unnecessary.

If your horse's hindgut has been compromised to the point that the bacteria aren't producing enough B12, it's more important to promote hindgut health — not just use B12 as a band-aid for the anemia problem.

Treat the Underlying Cause of Equine Anemia

Anemia in horses is always a symptom of an underlying disease. Even if you can raise the level of red blood cells in your horse through supplementation, you still have a health condition that continues to cause ongoing health and performance problems. Anemia is a signal that you need to work with your veterinarian to dig deeper.



There are a host of health conditions that can contribute to the reduction of red blood cells in a horse's body. Chronic blood loss from ulceration, parasites, or chronic inflammatory disease may be the cause. Blood destruction caused by toxins, parasites, infection, and more could be the problem. Or perhaps kidney disease, cancer, or nutritional deficiencies are impacting the horse's ability to produce enough red blood cells. These examples are all serious health issues behind anemia in horses that need to be diagnosed and treated by your vet.

Once the underlying disease has been treated and resolved, the horse's red blood cells levels will return to normal on their own with no additional treatment necessary. It generally takes the equine body between 2–6 weeks to replenish red blood cells.

The bottom line: get your horse healthy and let anemia resolve on its own.

Conclusion

EQUINE anemia is a problematic condition that impacts a horse's health and performance ability. And it always results from an underlying disease that additionally compromises a horse's wellness. If you are concerned that your horse may be anemic, take the time to grasp the full picture of what anemia in horses is, the various conditions that may cause it, the symptoms to look for and tests to confirm, and consider the link between anemia and the high occurrences of GI ulcers in horses.

Always be sure to consult your veterinarian who can run blood panels and other tests to determine an accurate diagnosis and appropriate course of treatment.

For more information on horse health and nutrition, visit www.succeed-equine.com.



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