



Ammonia and its Dangerous Effects on Respiratory Health

Poor respiratory health severely affects performance and stamina. StallBlaster is your defense against the dangerous and potentially career-ending effects of ammonia. The following information, as compiled by the creators of StallBlaster, represents two years of research and experimentation before bringing StallBlaster to market in 2019.

Ammonia is a caustic gas. It's a strong irritant even in small doses.

Protecting your equine athlete's respiratory health begins in the barn. Keeping the respiratory system healthy is critically important to his performance, and to his health overall.

While much is known about the dangers of ammonia vapors—to horses and humans—there hasn't been a lot of progress in terms of treatment solutions that knock down the vapors at their source—the dreaded pee hole...the place your horse has determined is THE spot to urinate in his stall, thoroughly saturating the ground (soil, mats, shavings, straw) until it's oozing with a black goo that will send even the most tolerant human outside, gasping for a breath of fresh air. We know. That was us. And that's the reason we were determined to create a product that would vastly improve the air quality in our own barn, for ourselves and for our horses.

The discomfort caused by these ammonia vapors goes well beyond the pungent odor, however. They're irritating to the mouth, eyes, sinuses and respiratory tract and present a true health risk. Pre-existing conditions are made worse by the exposure to these vapors.

Ammonia vapors are heavy, so they're most intense near stall floors. While we're seriously affected mucking stalls, imagine what the horse is experiencing with his head down while eating, or lying down. He is breathing the worst air in the entire barn, and that's really bad news for his lungs.

Horses and the people tasked with caring for them in these confined spaces can be exposed to very high, unhealthy amounts of ammonia. Regular exposure causes narrowing of the airways and an increase in mucus production . . . which together cause a decrease in stamina and overall performance.

Exposure over time will likely cause respiratory issues even when the horse is resting, and eventually this exposure may cause breathing difficulties. When foals are exposed to ammonia vapors (think about how much lying down they do), they are at even greater risk of respiratory issues, including pneumonia.

How much is too much?

NIOSH, which is the government agency that makes recommendations to OSHA (Occupational Safety and Health

Administration) has published what they consider to be safe exposure limits for an eight-hour work day. NIOSH's recommended exposure limit to ammonia is 25 ppm. NIOSH has added a short-term exposure limit (15 minutes maximum) as high as 35 ppm.

These ppm numbers are at the maximum of what's considered safe in an eight-hour day. Now consider that the stalled horse is often times exposed to these vapors for 20-24 hours a day.

With these NIOSH exposure limits in mind (once again, 8 hours of 25 ppm and up to 15 minutes as high as 35 ppm), consider the numbers (see below) that were found in barn after barn over a six-year period. ¹ These were upscale facilities, cleaned at least once a day, most with huge fans below the ridgeline of the roof, designed to pull stale air up and out while pulling fresh air in through the double doors at the ends of each aisle. Are you ready for these staggering figures?

In every facility, the ammonia levels inside the stalls ranged from 80 to 450 ppm when measured within 12 inches of the stall floor. That's roughly 3 to more than 12 times the acceptable levels of ammonia. At human nose height, the barns measured from 10 to 50 ppm. This is a dramatic and jaw-dropping example of the extreme risk to stabled horses, especially when their heads are down, yet even with their heads up the 80 ppm number



Their Speed is Based on What They Breathe...

Dangerous ammonia vapors threaten the respiratory health of your horse and may compromise blood capillaries, leading to a greater risk of Exercise Induced Pulmonary Hemorrhage (EIPH).

To lessen one possible risk of EIPH bleeding, consider using StallBlaster in stalls and during transport. It will drastically reduce the harmful ammonia vapors to safe levels.

**For a sample and help with any questions,
please call or email us.**



By I.C.E.
Products
USA

The success of your equine athlete's career depends on many factors, not the least of which is a strong, healthy respiratory system.

StallBlaster in your barn is your first defense.

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is more than 2 times what a human can safely endure for just 15 minutes.

And for more perspective, humans exposed to 110 ppm (that's just a quarter of the 450 ppm mentioned above) reported they had irritated eyes and throats and an increased urge to cough. At 110 ppm for four to eight hours the person or horse is at risk for the health consequences to be irreversible, including the possibility that athletic ability and exercise tolerance will decline.

At the 450 ppm numbers found in those high-end horse facilities, these levels are very likely to cause health effects that can seri-

ously alter an equine athlete's future. ² In the trained horse it is the respiratory system that is considered the main limiting factor to performance, followed by heart and skeletal muscles. The respiratory system does not change as the horse gets fitter with training and exercise.

From the Horse.com article Tips for Maintaining Racehorse Respiratory Health, Susan Holcombe, VMD, MS, PhD, Dipl.

ACVS, ACVECC is quoted as saying "Horses are unique, in that their athletic performance is limited by their pulmonary (lung) function rather than their heart function, as most other species are. As such, keeping the respiratory system healthy and functioning properly is key to facilitating good performance and overall health."

What can you do?

Of course, the obvious solution is to reduce the number of hours a horse is exposed to the dangers of ammonia vapors. These include keeping him pastured as much as possible and doing the stall mucking when he's not in the stall. Keep-



Horses in transport are also faced with similar exposure to high levels of ammonia vapors.

ing wet bedding and manure picked up will help tremendously, as will taking steps to reduce dust. Although the fans aren't much help to horses when they're eating, they'll improve the air at the human nose level, though still hovering in the danger zone above 25 ppm.

Even a barn full of fans and open doors and windows has been shown to have little or no effect on the ammonia vapor

that is concentrated within 12 inches of the stall floor. Most of the air a stabled horse draws into his lungs is within that floor-level range where ammonia levels are highest.

What more can you do?

You can provide your horses (and their human caretakers) a healthier environment by making regular use of StallBlaster. This is a completely nontoxic biological solution that's sprayed or poured using a garden-type watering can onto urine-soaked areas such as the soil itself, as well as on and under mats and bedding. StallBlaster should also be applied to areas where manure has been removed, since those, too, produce ammonia.

How StallBlaster works

StallBlaster's naturally occurring microbes go to work immediately by digesting the organics (bacteria) in the urea-laden urine which are the main source of these unhealthy vapors.

It's interesting to note that healthy urine itself is sterile and odorless. The urea in urine contains a protein that when

it is absorbed into the soil the bacteria creates an enzyme which digests the urea, and ammonia is created as a by-product.

And as long as the urea remains in the stall, untreated, the population of the ammonia-causing bacteria will reproduce at an incredible rate. We've all seen that black toxic sludge. Regular use of StallBlaster will destroy those odor-causing bacteria.

Bottom Line

StallBlaster drastically reduces the harmful ammonia vapors to safe levels in barns and during transport. One of the many presumed causes of Exercise Induced Pulmonary Hemorrhage (EIPH) is inflammation of the horse's airway. It just makes good sense to reduce unhealthy ammonia vapors as a precautionary measure.

The future of your equine athlete's career requires optimum performance. His strong, healthy respiratory system makes a massive contribution to his speed and endurance that are at the very heart of his success at the track.

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CREDITS:

1 A report published in 2018 by Karen E. N. Hayes, DVM, MS.; award-winning author of five horse-care books and hundreds of articles in such magazines as *Equus* and *Horse & Rider*. A 1979 graduate of the University of Illinois College of Veterinary Medicine and a lifelong horsewoman, Dr. Hayes was in private practice for several years, joined the faculty at Wisconsin's veterinary school, earned a post-doctoral Masters degree in equine reproduction there, then returned to private broodmare practice.

2 Excerpt from published writings by Dr. David Marlin, exercise physiologist.