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Bedding Benefits and Risks

By Sarah Evers Conrad • Oct 01, 2002 • Article #13364

Most horse owners take great pride in providing their horses with clean, nice-looking stalls; some of us might even throw in that extra bit of bedding for added comfort. But could we be unknowingly harming our horses more than helping them? Let's examine some facts on the various types of common bedding and how they can affect our horses' health. Armed with this knowledge, we can make informed decisions about what bedding is right for our horses and our situations.

The Air in There

What makes our choice of bedding so important? According to the book *Equine Respiratory Diseases*, edited by Pierre Lekeux, DVM, PhD, a professor at the University of Liege in Belgium, the adult horse is exposed to 30 million liters of air annually--air that contains a mixture of gaseous and particulate pollutants. The primary sources of airborne dust in stables are feed and bedding. Airborne dust can include such harmful substances as bacteria, viruses, molds, insect debris and feces, plant material, bacterial endotoxins, and inorganic dusts. Several equine respiratory disorders, such as heaves, inflammatory airway disease, and pharyngeal lymphoid hyperplasia (inflammation, allergic reaction, and ulceration of the lymphoid tissue at the rear of the throat), are directly caused by, or aggravated by, the inhalation of airborne dust.

If you keep a horse with an infectious respiratory disease in a dusty environment, this might

cause increased coughing, mucus hypersecretion (secretion of more mucus than normal), and bronchoconstriction (tightening of the airways). All of this can prolong recovery. Lekeux wrote that stressing the convalescing horse in this way can also lead to sensitization (increased reactivity) to inhaled environmental allergens, which can cause heaves.

The bad news is that if you're not careful, your sick horse could end up with a chronic and painful condition. The good news is that management techniques can help minimize the dust in your stable, keeping your sick horse (and your healthy ones) breathing easier. "Effective hygiene measures may reduce dust exposure by up to 90%," noted Lekeux.¹

Maintaining proper ventilation inside your barn is a must for equine respiratory health. But even with the best ventilation, the dust content of bedding must be considered. While there are a variety of scientific ways to measure the dust content in your horse's stall, Edward Robinson, BVetMed, PhD, MRCVS, a professor who specializes in equine respiratory diseases at Michigan State University, suggests a simple method.

"The best thing is to shake the bedding up yourself and see what it looks like. Smell it," he says. "If you find that you're uncomfortable while bedding the stall and want to run out of there, you should remember that your horse has to live in that environment."

Keep in mind that the highest airborne dust levels occur during mucking out--reaching levels of 10-15 mg/m³ and containing 20-60% respirable particles (small enough to be inhaled), according to Lekeux. This can equate to 12 million inhaled particles per breath.

One way to save your horse from breathing in all of this dust is by removing him from the stall while you are cleaning. (You might even want to wear a face mask for your own protection.)

Susan Raymond, PhD candidate (Life Sciences) and research associate at the Equine Research Centre at the University of Guelph in Ontario, Canada, says that bedding quality is also an important factor. The better the quality, the less dust is likely to be in the bedding.

"The quality of bedding can have a big impact on the short- and long-term health of our horses," she says. "Horse owners should really take a close look at the quality of the bedding that they are purchasing, and if a bedding is quite cheap, it might be for a reason. Before purchasing a product, find out the type, source, and baling/packaging conditions."

So by choosing good-quality bedding that you inspect yourself, the risk of dust problems can

be reduced.

Factors in Choosing Bedding

Good managers need to ask themselves some additional questions prior to choosing bedding. These include:

What health concerns are involved with each type of bedding?

What are the advantages and disadvantages of each type of bedding you are considering?

What is the availability of these products where you live? Are you willing to pay more to have a certain type of bedding shipped?

Where will bedding be stored?

How will you dispose of bedding; are there any regulations on disposal in your area?

Will the type of bedding you choose work with your stall flooring?

If your horse has a respiratory disease, or develops one, how can you best manage your stable to aid in his comfort?

There are many types of bedding available. Some of the more common ones include straw; wood products such as shavings, wood chips, sawdust, and pelleted products; recycled paper or cardboard products; peat moss; hemp; and synthetic products.

Straw

Straw is harvested from cereal grains, such as wheat, barley, oat, and rye. Raymond says that straw's main disadvantage is that because it is a crop, it is susceptible to mold and can be quite dusty.

"It is an inconsistent product," she says. "If there has been a rainy season, it can be a moldy product. It is not recommended for horses with respiratory problems. There is a lot of wastage, and a high volume must be used. It's also not very absorbent."

However, she says, it is readily available in certain areas, such as where she lives, and this makes it reasonably priced. She says mushroom farms will take away the used bedding, so disposal is not an issue.

However, Bob Coleman, PhD, PAS, equine extension specialist at the University of Kentucky,

says that straw is not always available in all areas. "In parts of the state of Kentucky, there is not much cereal grain production," he says. "If you are going to use straw, you are going to have to import it."

He says that the extra expense might be worth it if you have broodmares. Many people in Kentucky use it for foaling stalls since it's more difficult for straw to be inhaled by a newborn foal or to contaminate the umbilical cord (as is possible with shavings). Coleman adds that straw composts well and can be spread on cropland; however, disposal to mushroom farms is not as available in North America as it once was. "For a number of farms I know of, getting rid of stall waste that is straw-based is a major concern," he says.

Since horses might eat straw bedding, impaction colic can be a concern.

Raymond suggests that straw be stored out of the elements. "It is best up on pallets with air flow underneath," she says. "Make sure it doesn't get wet and start molding during storage. Pallets also can help minimize pests by making it easier to keep the storage area cleaner and reducing the chance of pests creating nests."

Raymond and Coleman say that straw is best used with stone dust or clay flooring so that excess liquid is allowed to drain off. Raymond says that if straw is used on a concrete or asphalt stall floor, excess urine that is not absorbed could make the floor slippery. In addition, straw has a tendency to shift, exposing the flooring; this could be hard on feet and legs if the exposed floor is concrete or asphalt. Coleman says that if you do use straw on a concrete or asphalt floor, more bedding is needed, which increases the amount you need to buy and dispose of.

Wood Shavings, Wood Chips, and Sawdust

Shavings and wood chips have some advantages over straw. They are more absorbent, more readily available, do not have the bulk of straw bales, provide more consistent footing, are available in truckloads or in bags, and there is less wastage. Most importantly, they are less susceptible to dust and mold, according to Coleman. However, one of the main disadvantages is that wood products do not compost easily.

"Disposal is becoming a bigger issue," Coleman explains. "There are certain places that if you are hauling horses to them, they will let you dispose of straw, but they may not let you dispose of a wood product. It's a matter of what will compost and what won't. Some landfills won't take wood products. Horse owners need to consider what regulations they have to live

with."

To find out about disposal regulations in your area, contact the Environmental Protection Agency or your local county extension office.

When looking for a good-quality wood product, Raymond recommends using soft woods such as pine and avoiding products that have been exposed to any type of chemical. *Never* use products made from the black walnut tree--it has been associated with laminitis. Also, avoid products made with yellow poplar, oak, and red maple since research has suggested these woods can affect liver and kidney function, or cause respiratory or skin problems.

Good-quality wood products often are recommended for horses with respiratory problems. While Raymond does not recommend using sawdust in any circumstances, Coleman feels that sawdust is fine to use if horses are not in stalls very much. They agree that shavings and wood chips can be used on any type of flooring.

Coleman suggests using plenty of bedding to start a stall; keep it clean and replenish bedding as necessary, but don't get carried away and put too much bedding in the stall. According to Lekeux, having too much bedding in a stall can lead to mold and endotoxin growth. How often the stall has to be stripped of all bedding for a thorough cleaning depends on how much time the horse spends in the stall.

Shredded Paper

Shredded paper's main advantage is that it is the most absorbent type of bedding, according to a study done by Raymond in 1998 at the Equine Research Centre. She compared straw, shavings, peat moss, hemp fibers, and shredded paper. When water was added to 10 grams of each material, shredded paper absorbed 100 mL, as compared to hemp (45 mL), peat moss (30 mL), and wood shavings (28 mL). Straw was the least absorbent material (25 mL).

Having an absorbent bedding is important because unabsorbed ammonia from urine can accumulate inside a stall and irritate the eyes and the mucous membranes of the respiratory tract.² A 1996 study by the Equine Research Centre looked at the effects of dust and ammonia by comparing ventilation rates and absorbency using straw and shredded paper. Results of the study indicated that even with a really good ventilation rate (27 air changes per hour; four air changes per hour is considered acceptable), ammonia levels exceeded acceptable levels for stalls bedded with straw. This suggests that the rate of ventilation cannot always compensate for the ammonia volatilized during mucking out stalls bedded with straw, which is less

absorbent than paper bedding.

However, Raymond cautions that if you live in a very muggy area, or one with a lot of humidity, paper can become saturated and very heavy. The 1998 study also showed that at maximum absorbency, paper increased its weight by 900%. By comparison, hemp increased its weight by 400%, peat moss by 300%, shavings by 254%, and straw by 225%.

Other disadvantages of paper include the risk of mold if the product has ever been exposed to the elements. Raymond recommends finding a consistent source of good-quality bedding. "You don't want beddings that have a glossy paper (associated with heavy metals), staples, glue, or ink other than vegetable ink," she says. "Find out the source of the paper."

Coleman says that people should not be surprised if their white horse gets up in the morning and is covered in newsprint. Also, since paper has the tendency to blow around, this can give a barn a messy appearance. Paper composts well, but having it spread on fields can be an unappealing sight.

However, Coleman says shredded paper is reported to be more hypoallergenic than all other beddings. If you are concerned about dust and mold, try switching to a quality paper product that does not have any of the previously mentioned components.

Paper can be used on most flooring types, except concrete and asphalt can become slippery if the paper becomes too saturated.

Recycled cardboard has the same features as shredded paper, but Raymond cautions that you have to be really careful of the source because if the original product (such as boxes) was exposed to rain, mold could be a problem. Ask the manufacturer if the product could have any shredded plastic (such as plastic wrap from the original packaging) in it, since horses might ingest the plastic.

Peat Moss

Peat moss bedding is made from partially decomposed sphagnum moss and is commonly used by gardeners to improve sandy and clay soil. Its ease of composting makes it an excellent bedding to use if disposal is a concern.

Raymond considers this a good bedding for horses with respiratory problems. It can appear dusty, but the particles are usually so large that they don't cause a respiratory problem.

Coleman likes peat moss because it is easy to muck out, comes in bags (although bags can be bulky), can be used with all types of stall floors, and it's easy to get neighbors to take it away for you. However, it does cost more, and it typically must be purchased at a gardening store.

In addition, gray horses can end up looking dirty, and it can create a film over water buckets. Raymond cautions that bags can freeze during the winter. She says that due to its dark color, peat moss might make it harder to spot manure.

"Some people love it. Some people hate it," she says.

Hemp

A ban against hemp products was removed in Canada in 1998, and now growing hemp there is government-regulated. This bedding is readily available in Canada, but must be imported into the United States. Hemp is dust-free, absorbs ammonia fumes (thus reducing stable odor), is easy to work with, horses won't eat it, and it decomposes rapidly. Raymond notes that quality can be inconsistent since it is a crop and can vary by growing season. It also can be susceptible to mold contamination. However, if you buy it from a reliable source, then it can be a good product to use.

Other Products

There is a variety of less common types of bedding, from plastic to clay-based, to a variety of pelleted products, to volcanic aggregate, and more. All have their own advantages and disadvantages.

Whatever bedding you choose, the general principles are the same: Watch for dust and mold, store bedding away from the elements, and keep the stall dry to avoid ammonia buildup. Your level of attention to your stalled horse's bedding parallels his level of respiratory and physical comfort.

REFERENCES

1 Art, T.; McGorum, B.C.; Lekeux, P. Environmental Control of Respiratory Disease. *Equine Respiratory Diseases*. Ithaca, New York: International Veterinary Information Service, 2001.

2 Curtis, L.; Raymond, S.; Clark, A. Dust and ammonia in horse stalls with different

ventilation rates and bedding. *International Journal of Aerobiology*. Vol. 12, 239-247, 1996.

FURTHER READING

See the Air Quality and Bedding sections under Facilities at www.TheHorse.com.

See the Respiratory Problems category at www.TheHorse.com.

5 TIPS: On Bedding

1. Always use a good-quality bedding.
2. Remove the horse from the stall while cleaning it.
3. Do not use too much bedding, which can cause mold growth and ammonia accumulation, but bed sufficiently for the horse's comfort.
4. Maintain proper ventilation.
5. Keep stalls clean and dry.

Seek the advice of a qualified veterinarian before proceeding with any diagnosis, treatment, or therapy.

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