# **HEALTH ZONE** / Barn Safety



Many barns, such as this one built in 2008 near Paris, Ky., include in their construction features that can help prevent fires and allow for easier evacuation should a fire occur

# Preventing and Mitigating Barn Fires

# NUMBER OF GROUPS PROVIDE EXPERTISE ON **PREVENTION**, **PREPAREDNESS**

# By AMANDA DUCKWORTH Photos by ANNE M. EBERHARDT

**WHEN IT COMES** to barn management, perhaps the worst four-letter word is "fire."

Quick to spread and often fatal for horses and potentially humans, fires can rip through an entire barn faster than its occupants can be evacuated. Fortunately, a combination of prevention and preparedness can halt occurrences or mitigate damage if disaster strikes. To prepare for such an event, multiple organizations—from the American Association of Equine Practitioners to the National Fire Protection Association to the Humane Society of the United States—recommend a fire safety checklist. Barn staff need to be trained in what to do if the worst occurs.

In its paper "A Review of Strategies to Prevent and Respond to Barn Fires

Affecting the Horse Industry," the AAEP provides a thorough education on the topic.

"Barn fires detrimentally affect equine recreational enthusiasts, horse owners, and practitioners, regardless of geographic location or economic conditions," explained the authors. "As the number one local emergency expected to affect agricultural facilities, fires kill more horses than any other type of disaster. Strategies and equipment to mitigate their effects are available but underutilized; the effectiveness of detection, alert, suppression, and immediate response systems is further emphasized by appropriate design, management, planning, and emergency drills."

Some standard protocols to keep in mind include prohibiting smoking in the barn; proper use of heaters; sufficient and properly installed electrical outlets; fire extinguishers near every exit and within 50 feet of any spot in the barn; storing hay, chemicals, and manure away from the barn; regular barn cleaning to remove debris; lightning rods; smoke detectors; and sprinkler systems.

If a fire occurs, one way to speed up the evacuation of horses is to have both front and back stall doors. While that might not always be possible because of a barn's architecture, it is vital to make sure that all stall hardware and door frames operate smoothly. When visibility is poor and seconds count, opening and moving stall doors with ease can play a critical role.

"Around the world, volunteer fire departments in rural areas are usually going to be the first responders to a fire scene, but the team of responders should include equine practitioners, to provide expertise, veterinary medical triage, treatment, and possible euthanasia," researchers said. "With only an average of three to five minutes to save equine lives, owners and bystanders will try to save the animals themselves. Education, better facility design, and alert

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# **HEALTH ZONE** Barn Safety

and suppression systems are key to decrease the risk of losing animals as well as people who try to help them."

Providing training to ensure farm staff are comfortable using fire extinguishers and understand a barn's evacuation plan is invaluable when the unexpected happens. If developing a strong fire evacuation plan seems overwhelming, an easy way to jump-start prevention is to ask the fire department to visit the farm to make recommendations on how to reduce risk.

According to the AAEP, beyond the obvious safety incentive of having a good plan in place, typically there also is a financial reward on offer. Many insurances companies will reduce premiums for those actively working to prevent fires. This reduction can range from 5%-10%, depending on the demonstrable fire safety measures taken, up to and including installation of a sprinkler system. Working with the local fire chief and an insurance agent could help save lives in the future, while also saving money in the present.

Another preventative measure that can prove extremely beneficial is provid-



Planning and emergency drills at farms can prepare staff should a fire occur

ing the fire department maps that show where horse barns, storage barns, fuel tanks, and water sources are located.

"Mrs. O'Leary's cow may have gotten a bad rap, but the folktale reminds us that fire safety is an important part of farm life," advises the National Fire Protection Association. "People, animals, and property are in danger when fire breaks out on the farm. Inspect your barn and outbuildings for fire hazards to reduce the risk of tragic loss."

No matter how prepared a barn might

be, fires can still happen. One issue beyond the control of good management particularly in the western part of the country—is wildfires.

"Preparing horses for a wildfire evacuation requires an extra level of planning, preparedness, and practice," said the NFPA. "Building an evacuation kit for each horse and having a plan for them that's been practiced, increases the potential your horses will be able to leave when you do. If the wildfire's proximity does not permit

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Four generations of the Kerckhaert family have combined practical experience with advanced technology to manufacture consistent, high-quality horseshoes. State-of-the-art machinery ensures the shoes meet their demanding specifications.

The Kings Plate (Flush Toe) is the shoe of choice for many trainers and farriers in the racing industry. These aluminum race plates are used in turf, dirt and synthetic racing, as well as in the early training stages of the racehorse. Add Liberty Race nails and you have a winning combination.

- Flush toe insert
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- Built-in sole relief
- $\cdot$  Good nail placement 7 nail holes in each side
  - Shape saves fitting time
  - The heel design saves finishing time
  - Wide web offers more support

Farrier Product Distribution is the exclusive distributor of Kerckhaert and Liberty brands in the U.S. and Canada. For more information on Kerckhaert Kings Plate (Flush Toe) and Liberty nails, visit www.farrierproducts.com. the time needed to load horses, it's best to turn them loose and not leave them confined in a barn or pasture. Close the doors and gates so they can't re-enter the area."

Large animals, including horses, often take more time to evacuate than one might anticipate. During normal times, working with a horse to ensure it is comfortable loading onto a trailer can pay dividends in emergency situations. Additionally, if more horses are on the property than there is trailer space, work with neighbors, family, friends, or vanning companies ahead of time to have a plan in place to acquire access to more trailers during a disaster.

If it's impossible to evacuate horses safely, the NFPA suggests different ways to improve the odds of reuniting with horses later. Steps include using a livestock crayon to write contact information directly on the horse, using

# "

MRS. O'LEARY'S COW MAY HAVE GOTTEN A BAD RAP, BUT THE FOLKTALE REMINDS US THAT FIRE SAFETY IS AN IMPORTANT PART OF FARM LIFE."

> -NATIONAL FIRE PROTECTION ASSOCIATION

clippers to shave contact information into the horse's coat, braiding a temporary contact ID tag into manes, or attaching neck bands.

While wildfires will always be a risk, fires that start in the barn are far more likely, and when it comes to the cause of those fires, there's a clear front-runner: heating equipment.

"Heating equipment, particularly heat lamps, was the leading equipment involved in these structure fires," explained Marty Ahrens, who wrote an April 2021 NFPA report. "Lamps or lighting equipment also accounted for unusually large percentages of fires in these properties compared to other occupancies. Note that when equipment is shown as a causal factor, the equipment simply provided the heat source. In many cases, the equipment was operating properly but was too close to

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Kerckhaert Kings Plate (Flush Toe) High strength aluminum with wide web, built in sole relief and good nail placement (7 nail holes per side). Available in front and hind patterns, sizes 2 - 8.





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# **HEALTH** ZONE

# Barn Safety



A barn at Margaux Stud near Midway, Ky. features front and back stall doors, which can speed up equine evacuation during an emergency



something that could burn or was used improperly."

According to the research, which used annual averages from 2014-2018, 43% of livestock structure fires were caused by heating equipment. Second, at 23%, was electrical distribution and lighting equipment. Other causes included arson (5%), exposure (4%), lightning (3%), spontaneous combustion or chemical (2%), and playing with a heat source (2%).

In terms of which items ignited first, there is no single, exceptional culprit. The latest research showed that unclassified organic materials as well as structural features or framing were each responsible 13% of the time. Close behind was light vegetation, including grass, at 11%.

"The items first ignited show that feed and bedding create a different



# THE IMMEDIATE TREATMENT OF HORSES RESCUED FROM FIRES POSES MANY CHALLENGES, NOT LEAST OF ALL KEEPING YOURSELF OUT OF HARM'S WAY."

# -DR. EMMA ADAM IN A PAPER FOR THE AAEP

fuel load than what is found in most occupancies," explained Ahrens.

It is because of that ignition power that most organizations strongly advise storing extra hay, straw, and shavings away from barns where animals are housed and working toward reducing on-site flammable materials.

When a fire breaks out, always call for professional help first before attempting to save animals. The Humane Society recommends that no one enter a barn if it is already engulfed. Should it be safe to enter, start with the most accessible stalls, and make every effort to put a halter and lead rope on horses before evacuation.

Because of their flight or fight tendencies, horses are at high risk of running back into their stalls if given the option, but for everyone's safety, blindfold horses only if absolutely necessary. Additionally, all horses that do survive the fire need immediate veterinary care as a result of multiple possible issues, including smoke inhalation, burns, and stress-induced risk of colic. Dr. Peggy Marsh addresses this in "Fire and Smoke Inhalation Injury in Horses," published by Veterinary Clinics of North America: Equine Practice.

"Although not common in horses, fire and smoke inhalation trauma may require veterinary assistance at several levels," she said. "Most commonly, the equine clinician is called on to provide care of potentially complex and emotionally charged cases.

"Thermal injury, along with smoke inhalation, can cause local and diffuse lesions. Massive tissue edema may occur, which can be a challenge to manage as well as creating organ dysfunction at distant sites. Further complications of severely affected patients are varied and include life-threatening sepsis."

include life-threatening sep

Walking into an unpredictable emergency situation such as a barn fire



An American Association of Equine Practitioners paper notes the heavy toll barn fires take on equine lives

means there are no fast and set rules, beyond trying to keep everyone as safe as possible. In the AAEP's "How to Cope with Barn Fires," Dr. Emma Adam walks veterinarians through protocols and procedures that usually prove helpful. Speed and efficiency play key roles in the immediate aftermath. "Barn fires can cause horrific injuries to horses, with high morbidity and mortality rates," she said. "Equine practitioners can be consulted for disaster-planning advice and can be called to the scene of a barn fire to provide urgent care.

"In these situations, emotions run



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# **HEALTH** ZONE **Barn** Safety



# When It Comes to Horse Health and Safety, Don't Hit the Easy Button

any horse owners want to reduce the cost of treatment by reaching for a "compounded" version of altrenogest (a progestin used in veterinary medicine to suppress or synchronize estrus in horses) in long-acting injectable formulations. BUT AT WHAT COST TO YOUR HORSE?

A compounder simply mixes up a drug preparation and sells it without any required testing for purity and concentration. This has been illustrated many times by horses DYING from compounded medications that weren't tested before being sold. Compounded products require no proof of efficacy, so you have no proof the product is even altrenogest or is safe.

When you use only FDA approved altrenogest products such as Altren® (altrenogest) Oral Solution manufactured by Aurora Pharmaceutical, the veterinarian and the horseman know the ingredients have been tested for purity and the final product has been tested for purity and stability. NO EXCEPTIONS. Also, before any drug formula is approved by the FDA, it must pass rigorous research trials that prove it is safe and works for its intended purpose.

So, the question every equine enthusiast must ask is whether convenience is more important than the peace of mind that comes from using the approved and tested product in your expensive mare? The answer should always be NO. Your equine partner will thank you.

> -Content provided by Aurora Pharmaceutical, Northfield, Minn. aurorapharmaceutical.com

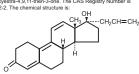
### Altren® (altrenogest)

SOLUTION 0.22% (2.2 mg/mL)

### CAUTION:

Federal law restricts this drug to use by or on the order of a licensed veterinarian. DESCRIPTION:

Altren® (altrenogest) Solution 0.22% contains the active synthetic progestin, altrenogest. The chemical name is  $17\alpha$ -allyl- $17\beta$ -hydroxyestra-4,9,11-trien-3-one. The CAS Registry Number is 850-52-2. The chemical structure is:



Each mL of Altren® (altrenogest) Solution 0.22% contains 2.2 mg of altrenogest in an oil solution.

### ACTIONS

Altren® (altrenogest) Solution 0.22% produces a progestational effect in mares.

### INDICATIONS

NULCATIONS: Altren<sup>6</sup> (altrenogest) Solution 0.22% is indicated to suppress estrus in mares. Suppression of estrus allows for a predictable occurrence of estrus following drug withdrawal. This facilitates the attainment of regular cyclicity during the transition from whiter anestrus to the physiological breeding season. Suppression of estrus will also facilitate management of prolonged estrus conditions. Suppression of estrus may be used to facilitate scheduled breeding during the physiological breeding season.

CUNTRAINDICATIONS: Altren<sup>®</sup> (altrenogest) Solution 0.22% is contraindicated for use in mares having a previous or current history of uterine inflarmation (i.e., acute, subacute, or chronic endometritis) alturai or synthetic gestagen therapy may exacutate existing low-grade or "smoldening" uterine inflammation into a fulminating uterine infection is some instances.

PRECAUTIONS: Various synthetic progestins, including altrenogest, when administered to ratis during the embryogenic stage of pregnancy at doses manyfold greater, than the recommended equine dose caused fetal anaelies, specifically masculinization of the female genitalia.

DOSAGE AND DIRECTIONS: While wearing protective gloves, remove shipping cap and seal: While wearing protective glowes, remove shipping cap and sear-replace with necessary lastic diversing cap. Remove cover from bottle dispensing lip and connect luer lock syringe (without needle). Draw out appropriate volume of Altern<sup>4</sup> solution. (Note: Do not remove syringe withle bottle is inverted as spillage may result.) Detach syringe and administer solution only at the rate of 1 mL per 110 pounds of body weight (0.044 mg/kg) once daily for 15 consective days. Administer solution of any large that all the rate of the second second second period and the second daily for 15 consective days. Administer solution of any large that beat concernence between on the marks as used period and the beat concernence between on the second period second secon uese of the mare stongue or on the mare's usual grain rat Replace cover on bottle dispensing tip to prevent leakage. Excessive use of a syringe may cause the syringe to stick; therefore, replace syringe as necessary.

HART:	Approximate Weight in Pounds	Dose in mL
	770	7
	880	8
	990	9
	1100	10
	1210	11
	1320	12

## WHICH MARES WILL RESPOND TO ALTREN® (altrenogest)

DOSAGE C

SOLUTION 0.225: Extensive clinical trials have demonstrated that estrus will be suppressed in approximately 95% of the marce willin three days; however, the post-freatment response depended on the level of ovarian activity when treatment was initiated. Estrus in marce schibiting regular estrus cycles during the breeding season will be suppressed during treatment, these marce return to estrus four to free days following treatment and continue to cycle normally. Marce in winter anestrus with small folicies continued in anestrus and failed to exhibit normal estrus following withdrawal.

Response in mares in the transition phase between winter Response in mares in the transition phase between winter anestrus and the summer breeding season depended on the degree of follicular activity. Mares with inactive ovaries and small folliciles failed to respond with normal cycles post-treatment, whereas a higher proportion of mares with ovarian follicles 20 mm or greater in diameter exhibited normal estrus cycles post-treatment. Altrenogest Solution 0.22% was very effective for suppressing the prolonged estrus behavior frequently observed in mares during the transition period (February, March and April). In addition, a high proportion of these mares responded with regular estrus cycles post-treatment.

### SPECIFIC USES FOR ALTREN® (altrenogest) SOLUTION 0.22% SUPPRESSION OF ESTRUS TO:

PPRESSION OF ESTRUS TO: Facilitate attainment of regular cycles during the transition period from winter anestrus to the physiological breeding season. To facilitate attainment of regular cycles during the transition phase, mares should be examined to determine the degree of ovarian activity. Estrus in mares with inactive ovaries (no follicles greater than 20 mm in diameter) will be suppressed but these mares may not begin regular cycles following treatment. However, mares with active ovaries (follicles greater than 20 mm in diameter) frequently respond with regular post-treatment estrus cycles.

- with regular post-treatment estrus cycles. Facilitate management of the mare exhibiting prolonged estrus during the transition period. Estrus will be suppressed in mares exhibiting prolonged behavioral estrus either early or late during the transition period. Again, the post-treatment response depends on the level of ovarian activity. The mares with greater ovarian activity initiate regular cycles and con-ceive soorer than the inactive mares. Alterne' (eltrenogest) Solution 0.22% may be administered early in the transition period to suppress estrus in mares with inactive ovaries to ald in the management of these mares or to mares later in the transition period with active ovaries to prepare and schedule the mare for breeding. 2.
- Scheduce the material of developing. Permit scheduled breading of mares during the physiological breading season. To permit scheduled breading, mares which are regularly cycling or which have active ovarian function should be given Altren<sup>®</sup> (altrenogest) Solution 0.22% daily for 15 consecutive days beginning 20 days before the date of the planned estrus. Ovulation will occur 5 to 7 days following the onset of estrus as expected for non-treated mares. Breading should follow usual procedures for mares in estrus. Mares may be regulated and scheduled either individually or in groups. 3.

ADDITIONAL INFORMATION: A 3-year well controlled reproductive safety study was conducted in 27 pregnant mares, and compared with 24 untreated control mares. Treated mares received 2 mL altrenogest solution 0.25%/110 lb body weight (2x dosage recommended for estrus suppression) from day 20 to day 325 of gestation. This study provided the following data:

- 1. In filly offspring (all ages) of the /as 2. Filly Fet
- parameters:
- mean interovulatory interval from first to second cycle and second to third cycle, mares only.
- at 50 days gestation, pregnancy rate in treated mares was 81.8% (9/11) and untreated mares was 100% (4/4).
- colt offspring of treated and control mares reached
- puberty at approximately the same age (82 & 84 weeks respectively).
- concentration, spermatozoal motility, and total sperm per eiaculate
- stallion offspring from treated and control mares showed no difference in sexual behavior.
- testicular characteristics (scrotal width, testis weight, parenchymal weight, epididymal weight and height, testicular height, width & length) were the same between stallion offspring of treated and control mares

REFERENCES: Shoemaker, C.F., E.L. Squires, and R.K. Shideler, 1989. Safety of Altrenogest in Pregnant Mares and on Health and Development of Offspring. Eq. Vet. Sci. (9); No. 2: 69–72.

Squires, E.L., R.K. Shideler, and A.O. McKinnon. 1989. Reproductive Performance of Offspring from Mares Administ Altrenogest During Gestation. Eq. Vet. Sci. (9); No. 2: 73–76.

### WARNING

For oral use in horses only. Keep this and all other medications out of the reach of children. Do not use in horses intended for human consumption.

### HUMAN WARNINGS:

Solution 0.22% is readily absorbed through unbroken skin. Protective gloves must be worn by all persons handling this reduct Demonstructure accurate and the sure that the second statement of the sec ct Pregnant women or women who suspect they are ant should not handle Altren<sup>®</sup> (altrenogest) Solution , Women of child bearing age should exercise extremen n when handling this product. Accidental absorption pregnant sh 0.22%. Wom could lead to a disruption of the mensural cycle or prolon-gation of pregnancy. Direct contact with the skin should therefore be avoided. Accidental spillage on the skin shoul be washed off immediately with soap and water.

INFORMATION FOR HANDLERS: WARNING: Altren® (altrenogest) Solution 0.22% is readily absorbed by the skin. Skin contact must be avoided; protective gloves must be worn when handling this product.

Effects of Overexposure There has been no human use of this specific product. The information contained in this section is extrapolated from data available on other products of the same pharmacological class that have been used in humans. Effects anticipated are due to the progestational activity of altereogest.

Acute effects after a single exposure are possible; however, continued daily exposure has the potential for more untoward effects such as disruption of the mestrula cycle, uners are abdominal cramping, increased or decreased uterine bleeding, prolongation of pregnancy and headaches. The oil base may also cause complications if swallowed.

In addition, the list of people who should not handle this product (see below) is based upon the known effects of progestins used in humans on a chronic basis.

### PEOPLE WHO SHOULD NOT HANDLE THIS PRODUCT:

- Women who are or suspect they are pregnant Anyone with thrombophlebitis or thromboembolic disorders or with a history of these events. 2
- 3. Anyone with cerebral-vascular or coronary-artery disease
- Women with known or suspected carcinoma of the breast.
- People with known or suspected estrogen-dependent neoplast
- Women with undiagnosed vaginal bleeding 6
- 7. People with benign or malignant tumors which developed during the use of oral contraceptives or other estrogen-
- containing products Anyone with liver dysfunction or disease

# 8.

Accidental Exposure Altrenogest is readily absorbed from contact with the skin. In Altrenogest is reaaily all assorbed from contact with the skin. In addition, this oil all assoched that product and addition, this oil and product and predirate provides of gives; however, if there is lakaged (e., pinhole, splillage, etc.), the contaminated area covered by such occlusive materials may have increased absorption. The following measures are recommended in case of accidental exposure. Skin Exposure: Wash immediately with soap and water

Eye Exposure: Immediately flush with plenty of water for 15 minutes. Get medical attention.

If Swallowed: Do not induce vomiting, Altren<sup>®</sup> (altrenogest) Solution 0.22% contains an oil. Call a physician. Vomiting should be supervised by a physician because of possible pulmonary damage via aspiration of the oil base. If possible, bring the container and labeling to the physician.

### Store at or below 25° C (77° F). Reclose tightly

### HOW SUPPLIED:

HOW SUPPLIED: Altren® (altrenogest) Solution 0.22% (2.2 mg/mL). Each mL contains 2.2 mg altrenogest in an oil solution. Available in 1000 mL and 150 mL plastic bottles.

Manufactured by: Aurora Pharmaceutical, Inc Northfield, Minnesota 55057



Approved by FDA under ANADA # 200-620

filly offspring (all ages) of treated mares, clitoral size v creased.	Vá
ly offspring from treated mares had shorter interval fro b. 1 to first ovulation than fillies from their untreated m unterparts.	

- There were no significant differences in reproductive performance between treated and untreated animals (mares & their respective offspring) measuring the following 3
  - interval from Feb. 1 to first ovulation, in mares only.

### follicle size, mares only.

- after 3 cycles, 11/12 treated mares were pregnant (91.7%) and 4/4 untreated mares were pregnant (100%).
- stallion offspring from treated and control mares showed no differences in seminal volume. spern



FDA-approved Altren® (altrenogest) Solution 0.22% is indicated to suppress estrus in mares. Altren is the only oral progestin available in a 150 mL single horse dosing package

FDA APPROVED – quickly and safely reduces the moodiness and temperament changes often associated with estrus and keeps your mare out of heat for all her major events

PROVEN PERFORMANCE – contains the same active ingredient and dosing regimen as Regu-Mate®

ECONOMICAL PACKAGING – unique, 150 mL individualized treatment package keeps product cost down and assures effective treatment



Altren<sup>®</sup> (altrenogest) Solution 0.22% is contraindicated for use in mares with a previous or current history of uterine inflammation. Talk to your veterinarian about proper use and safe handling of Altren. Avoid skin contact and always wear protective gloves when administering. Pregnant women, or women who suspect they are pregnant, should not handle Altren. Refer to the package insert by visiting www.aurorapharmaceutical.com for complete product information.

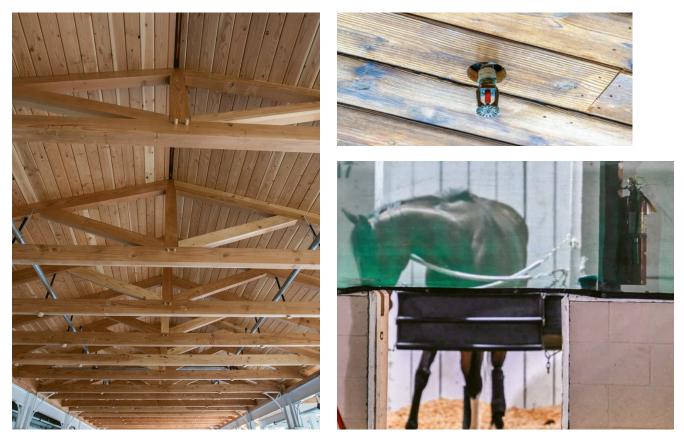
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For more information on Altren® consult your veterinarian or equine health care professional

# **HEALTH** ZONE

# Barn Safety



Tools that help in the fight of preventing and mitigating barn fires include sprinkler systems and readily available fire extinguishers

high, and making critical decisions can be difficult. The latent nature of many of the manifestations of thermal damage and smoke inhalation compound this difficulty. Effective communication, rapid and efficient triage, fluid resuscitation, and referral for specialized therapy can offset some of the devastating effects of barn fire disasters."

As she explains, no matter how tragic the circumstances are when arriving at a barn fire, it is imperative to follow the directions of the fire department as they are the leaders in this kind of situation. Understanding equine response to thermal damage and smoke inhalation is not straightforward. While a lot can be extrapolated from human data, obviously horses can't talk, and they are treated in different environments than the sterile burn units designed for humans.

That said, understanding the details of the situation can provide guidance. The nature of the fire, its location, and what materials burned can help experts understand the horses' most likely ailments. For example, open barn structures can reduce smoke inhalation while partial combustion can lead to a higher degree of carbon monoxide toxicosis.

Unfortunately, even the heroic act of getting a horse out of a burning barn does not guarantee a safe outcome.

"The immediate treatment of horses rescued from fires poses many challenges, not least of all keeping yourself out of harm's way," Adam said. "The most urgent needs are to gain venous access and institute immediate and aggressive fluid resuscitation to offset shock. Additional therapy should be directed at limiting oxidative damage and hypoxia, controlling pain, and triaging the cases to a care facility. Hyperbaric oxygen is an excellent therapeutic modality and should be provided if at all possible.

"An initial assessment of prognosis is often difficult; it can be hard to appreciate the extent of cutaneous, ocular, and systemic organ damage immediately to extrapolate the cost and length of care of these cases. However, in cases of severely affected patients, euthanasia may be the most reasonable and ultimately humane option."

The emotional trauma of a barn fire is impossible to measure, but the financial loss is also significant. Destroyed structures and vehicles along with the loss of the horses themselves as well as tack and other equipment often add up to a devastating economic blow.

While some suggest fire prevention techniques might seem tedious and time-consuming, having a plan in place and a clean barn could become the difference between life and death, when it comes to both humans and equines. Working with barn staff to understand the best approach to a worst-case scenario might pay emotional and financial dividends in the future.

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