The Breeding Shed

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Take Home Message: The equine breeding shed requires conscientious and experienced horse handlers for smooth operation. The primary objective in the shed is the transfer of stallion semen, either by natural cover or collection, but the importance of safety, for both personnel and horses is sometimes overlooked. Many of the precautions taken to ensure safety with breeding stock not only protects horses and people also contribute to optimizing the quality of the ejaculate and improved biosecurity as well.

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I. INTRODUCTION

There are a multitude of factors that affect the quality of a stallion’s ejaculate. Often overlooked, the events that occur in the equine breeding shed can have a profound impact on the ultimate fertility of the semen. One must take into consideration many influences, from the design and location of the breeding shed, to the experience of the horse handlers, to the coordination of semen collections/inseminations, as well as to the biosecurity of the facility. Furthermore, practical steps taken to maximize safety to both personnel and breeding stock can be readily implemented into any shed operation.

II. SAFETY

The importance of safety in the breeding shed cannot be overemphasized and must incorporate, in order of importance, safety of personnel, safety of breeding stock,1 biosecurity, success of breeding or collection of semen, and resultant quality of the ejaculate. Familiarity with stallion behavior and breeding shed processes are equally important to a smooth operation in the breeding shed. It is essential, as well, to ensure that training for safety in the breeding shed is incorporated into the veterinary school curriculum.2

Working with horses poses an inherent risk of serious injury for even the most experienced horseman. The Equestrian Medical Safety Association (EMSA) analyzes data provided by the National Electronic Injury Surveillance Survey (NEISS) for horse-related injuries seen in hundreds of emergency rooms (ER) across the United States on an annual basis. Results from this analysis in 2007 showed that of 78,279 injuries seen, the most common injuries reported in this study were fractures (28.5%), contusions and abrasions (28.3%) and strain/sprains (14.5%).3 Less common injuries included internal injury (8.1%), lacerations (5.7%), concussions (4.6%), dislocations (1.9%) and hematomas (1.2%). The most common sites of injury were the lower trunk (19.6%), head (15.0%), upper trunk (13.4%), shoulder (8.2%), and wrist (6.8%). In this study, fatalities comprised less than 0.1% of the injuries seen by ER personnel. Other researchers have reported that the majority of horse-related deaths are not performance-related, but behavioral in nature2 and occur while a person is unmounted.

In this regard, it is estimated that 20-34% of horse-related injuries are the result of an unmounted accident, as opposed to injuries that occur while horseback riding.4,6 Although the sites of injury to unmounted patients was similar to mounted patients [lower extremity (34.7%), upper extremity (25.%) and head (20.2%)], the most common injury sites of the unmounted patient were found to be in far greater proportion of total injury sites when compared to those of the mounted patient. The most frequent mechanism of injury to the unmounted patient was a kick or strike by a horse (11.2%), followed by being stepped on (6.1%) and pushed into, jerked or knocked down (3.0%). Other less common circumstances that lead to unmounted injuries include bites, horses spooking, striking an object, catching a body part, being hit by a horse’s head, and being hit by a falling horse.

In 2013, The British Equine Veterinary Association launched a large study that probed the incidence and type of injuries for horse veterinarians by equids. To the author’s knowledge, the results of that study had not been released at the time of publication.

There are many ways on a breeding farm to optimize safety, from the design of the shed to restraint of the mare and stallion,2,8 to the quality of a phantom, to training and attire of personnel.

III. PHYSICAL LAYOUT

The design of a breeding shed should take into account not only its physical layout but also its proximity to the stallion stalls and...
laboratory. There are many advantages to housing a stallion close to the shed, so that the distance that an excited, less trained stallion travels on his way to the shed is minimized. Housing that is close to the shed may be an advantage as well to a young or inexperienced stallion, or one with low libido, for the stallion is able to at least have the auditory, if not the visual stimuli of the breeding shed.

The size of the breeding shed should allow ample area for movement of personnel, a tease mare, and a stallion. A wash area, ideally outfitted with padded disinfectable walls, should be located within the shed or just adjacent to it. Many successful breeding operations have designed an adequate and safe shed that is no larger than a 12X12 ft stall. Regardless of the size of a breeding area, there should be numerous escape routes for personnel and the tease mare. As well, the entire property should be secured by fencing and gates in the event that any of the breeding horses get loose during breeding or collection.

IV. MARE TEASING

The size of the mare teasing area should be at least as large as a set of stocks plus a full diameter equal to a stallion’s length. A teasing chute is an alternative and can have the advantage of providing a double function as a teasing area for multiple mares and a mare breeding/collection area. A mare can be positioned with her chest against and her head over the front of the chute, while she is secured by a handler. The teasing chute is usually heavily padded to prevent injury to the mare and stallion limbs should they strike or kick. Also, a single stall in the breeding shed can be an advantage because it is used as either a mare teasing area or the stall can house a stallion that perhaps requires mares to approach him for arousal.

A teasing mare may also be restrained by a handler and positioned beside a phantom. There must be adequate space not only for positioning of the mare’s body, but for exiting the breeding shed rapidly should the need arise.

V. PHANTOM

The phantom should be located in close proximity to the teasing area, ideally within a few steps forward, backwards or to the side. This system works well for training stallions to the phantom as well as for easily managed stallions that are habituated to the collection protocol.

Variability of the phantom in both height and angle effectively accommodates different sizes of stallions. Ideally, the outer phantom cover should be durable, nonabrasive, disinfectable and provide adequate traction for the front legs of the stallion. Leather phantom covers are durable and provide traction but cannot be disinfected adequately. Wrapping the mounting/collection end of the phantom in plastic wrap between stallions will minimize the possibility of venereal transmission of organisms. A durable, slightly roughened, material called herculon/herculite is an often recommended material for a phantom cover because it is less expensive than leather and, as opposed to leather, it can be repeatedly scrubbed with detergent and rinsed with alcohol between stallion collections without destruction. A washable, faux fur phantom cover can be placed over the phantom for collection of the occasional stallion that suffers abrasion of the medial carpi while gripping the phantom during collection. The faux fur should be washed with detergent between stallions.

Some managers prefer a cut-away mounting end of the phantom to better secure the artificial vagina (AV) during collection. This system works well unless collecting a stallion that has a penile deviation to the opposite side. Phantoms are also available with removable artificial vaginas that fit into the mounting end. Although advantageous in that a single person can both handle and collect a stallion that has been trained to such a device, this type of phantom may prove unsafe for amateur stallions that move rapidly around the rear end of the phantom while mounted. Stallions have been injured by these phantoms with a built-in AV either from catching a foot in the latched opening for the AV or lacerating the penis when it is inadvertently thrust between the AV and the metal interior of the phantom.

VI. FOOTING

The most important considerations in choosing the flooring are cost, resistance to slipping, particle dust and biosecurity. Gravel, sand, compacted dirt and hog fuel are examples of inexpensive materials that are not slippery. However, particles are readily kicked up as the stallion moves, often leaving traces of particulate matter on the penis, which in turn can lacerate the penis and make the stallion reluctant to breed.

None of the materials discussed above confer adequate biosecurity, because they cannot be disinfected. The use of rubber mats, rubber bricks, or sprayed composite flooring has the advantage of permitting good disinfection. However, traction is sometimes compromised and they are expensive materials. As an alternative, the placement of a woven coconut or plastic grass mat at the mounting of the phantom can provide good traction but cannot be disinfected easily.

Lastly, adequate drainage must be considered in designing a breeding shed. Whether washing the phantom, equipment, the perineal area of a mare or the stallion’s penis, the water that collects on the ground may make the flooring slippery or form puddles that can splash debris on the stallion’s penis. Furthermore, adequate drainage is also important for biosecurity measures since standing water can harbor microorganisms.

VII. RESTRAINT-STALLION

Although excellent articles have been written on appropriate handling and restraint of a stallion in the breeding shed,7 there is no form of restraint that replaces adequate training in basic
horsemanship. Although normal behavior permitted in the breeding shed is different than that expected on a show ground, the basic principles of respecting space and command of a handler are the same. A stallion that does not respect these basic principles should be removed from the breeding shed and reminded of appropriate behavior in a place where the stimulus of breeding is not a distraction.

The most common restraint device used on a stallion is the stud chain. Made of heavy metal links, a stud chain can vary in length between 12-24 inches. The author prefers a stud chain that is not permanently attached to a leather shank or rope so that it can be applied or removed easily. In general, the areas of minimal pressure to maximal pressure on which the stud chain is applied include over the nose, around the nose, under the chin, through the commissures of the mouth (like a bit), and against the gum of the maxillary incisors (called a lip chain).

A variety of attachable bits can be snapped to the halter as well. Many breeding sheds use a stallion bridle and bit for restraint, especially if the stallion is accustomed to being worked in a bridle. At many European Stud farms, young colts are worked daily in bridles, hand-driven in long lines. These long reins can be extremely effective in properly positioning and handling a stallion in the shed and possibly offer the ultimate control over the direction of his entire body.

Another restraint device is called a stallion halter or iron halter. This device is a leather or nylon halter with a heavy iron noseband. A quick jerk on the noseband causes sharp pain; often stallions will respond quickly towards submission. Judicious use of such a device is advised, for following improper use of this device, a stallion may then show extreme reluctance to exhibit normal libido and behavior.

A muzzle made of iron or nylon may be used to protect both mares and the handler from a stallion that bites. One of the disadvantages of the more common iron muzzle is that the handler can be inadvertently hit with the muzzle if the stallion swings his head. Thus a muzzle made of nylon may be a safer choice.

Some young stallions are easily distracted or frightened during the early training sessions in the shed. Blinkers of various sizes are easily applied over a halter and may help to focus the stallion’s attention.

Tools used for stallions that rush a mare or the phantom include anything that will divert his attention away from his area of interest. Some stallions may respond to the mere presence of a whip and refrain from charging. A colorful plastic bat that makes a snapping noise upon contact with the stallion’s shoulder or chest is often very effective in diverting a stallion’s attention. A plastic sleeve tied to the end of a dressage whip may also be effective. Because stallions are likely to become desensitized to these diversions, appropriate training must be applied at the same time that these tools are used.

The mare’s restraint is equally important so that the stallion and personnel are not in jeopardy. Adequate protection of the mare and from the mare must be addressed. A mare in standing heat makes an ideal tease mare. Housed in padded stocks for teasing, she is protected from the stallion and he is protected from her. If not restrained in stocks, hobbles can be applied to her rear legs to minimize the impact of a kick. Hobbles, however, are often more of a liability than an asset, for they can release unexpectedly, or get tangled in the legs of a panicked mare or inexperienced stallion. A quick release mechanism for the hobbles must be readily accessible and easy to use should the breeding go awry. Felt or leather booties can be used to cover the rear hooves of the mare to lessen the impact of a kick.

Many of the restraint devices described for the stallion may be used on the mare. In addition, the application of a twitch to the upper lip of the mare may be useful in immobilization of the mare. Occasionally, a mare may require sedation to be bred or serve as a mount. This option should be considered as a last resort, because it is challenging to balance the ideal amount of chemical restraint for an individual mare.

Lastly, to protect the mare from the stallion’s bite, a shroud can be worn around the neck of the mare. Many stallions will grasp the shroud within their teeth either during teasing or while mounted.

IX. PERSONNEL

The importance of the person who handles the stallion to the entire operation of the breeding shed cannot be overemphasized. The stallion handler is ultimately responsible for directing both the stallion and other personnel as well as the mare within the shed. They should have not only extensive horse experience, but experience in handling stallions.

Many injuries to breeding shed attendants and horse handlers can be readily prevented with appropriate attire. Helmets should be a requirement. The most common helmets used are ASTM-certified riding helmets, but a motorcycle or hockey helmet with a face/mouth guard may yield superior protection.

The use of leather shoes and gloves protect the feet and hands of handlers. A leather jacket may lessen or prevent injury from a bite. Finally, an enforced safety vest, such as those required for cross-country riding, may protect against upper body injury.

Communication is equally important to all the above means of restraint and safety. Communication between personnel before, during and after collection is paramount. Diversions, such as unnecessary conversation or cell phone activity, may prove hazardous.

It is important for personnel to form a plan. One person should be in charge and that responsibility is usually designated to the stallion handler. For purposes of not only liability, but also
safety, personnel in the breeding shed should be employees of the veterinarian.

All horses are unpredictable, and therefore, an evacuation plan should be discussed in advance. Stallions can get loose. They can lose consciousness while mounted. The teasing and breeding may not go as planned, and horses and personnel must be quickly evacuated until a new plan is developed. Although it is impossible to plan for all scenarios, agile and experienced personnel will optimize safety.

X. QUALITY OF EJACULATE

A study conducted by Sieme, et al reported convincing evidence that semen quality and stallion fertility are significantly affected by events in the breeding shed, specifically latency of erection to ejaculation and the number of mounts to ejaculation. These researchers found that sperm motility and viability following both cryopreservation and 24 hours of cooling were negatively impacted by increasing the time that a stallion spent teasing before ejaculation, as well as an increasing number of mounts to ejaculation. The results are supported by a subsequent study where the researchers concluded that it was critical to limit the number of mounts that a stallion took before ejaculation in order to optimize the semen quality for cryopreservation.10

XI. CONCLUSION

For those in the breeding shed, safety should be considered at all times, both for personnel and breeding stock. Implementation of practical means for reducing the risk of injury, including animal restraint, breeding shed design, and handler training and protective clothing, should be an important part of not only every breeding operation, but also in the training of veterinary students who plan to work with horses. Precautions taken to optimize safety will improve biosecurity as well.

Each stallion should be evaluated individually and appropriate steps must be taken to ensure breeding shed safety. Optimal preparation of equipment, personnel and horses will result in improved semen characteristics and fertility and, therefore, a more positive experience for all involved.

REFERENCES