

Common Reproductive Problems in Mares

One of the most challenging parts of breeding season is getting every mare safely in foal. Dr. James Bailey, a practitioner with Royal Vista Southwest, an equine reproduction-focused practice in Purcell, Okla., deals with broodmare challenges on a regular basis. “Mare owners should always be thinking about the next breeding season, looking at mares in the fall before they cease cycling (anestrus),” he said. “This is a good time to do a work-up on mares that are open. Our basic work-up here includes palpation, ultrasonic evaluation, examination of the cervix, uterine biopsy, and uterine culture (assessing for microbial growth in the laboratory). The culture should include aerobic bacteria, and the veterinarian might also want to culture for anaerobic bacteria as well as fungal

infections—depending on the age of the mare and the problems that have been encountered with her in the past.

“At this time we also try to diagnose and evaluate any conformation problems and do a Caslick’s (procedure, which involves suturing the upper part of the vulva together) to correct pneumovagina (aspiration of air into the vagina, or wind-sucking) due to bad conformation or from a previous foaling injury,” explained Bailey. “We also evaluate the mare for any cervical or uterine injury. All anatomical problems should be ruled out or evaluated at this examination.”

ENDOMETRITIS

Endometritis, or inflammation of the innermost lining of the uterus, is the leading cause of infertility in broodmares. “When

we discover problems in the fall or during the breeding season, I like to divide them into whether they are infectious or non-infectious,” explained Bailey. “Many times our biopsy will reveal a level of endometritis that’s not associated with an inflammatory cell picture that indicates bacteria, and the mare will have a clean culture. This inflammatory condition in the uterus is not associated with infection. This is a very common problem and can usually be treated quite successfully with anti-inflammatory drugs. We usually treat these mares and do another biopsy in a month to see if we have corrected the condition,” said Bailey.

Dr. Mats H. Troedsson, a veterinary reproduction specialist and professor of Equine Reproduction, department chair of Veterinary Science and director of the University of Kentucky’s Gluck Equine Research Center, says we know much more about endometritis than we did 20 years ago. “At that point we thought that all forms of endometritis were caused by bacterial or fungal infection. Now we know it can be simply inflammation caused by breeding. Every time a mare is bred, the semen itself causes inflammation—which is necessary to facilitate clearance of the uterus. The stallion ejaculates directly into the mare’s uterus, so there are billions of sperm cells, seminal plasma, and debris deposited there. When the mare is bred naturally, there is always some bacterial contamination as well,” he explained.

Even though there are billions of sperm cells in one ejaculate, only a few thousand reach the oviduct (fallopian tube) and have anything to do with fertilization. “The rest of the sperm, and the seminal plasma and bacterial contamination, must be cleared from the uterus. This happens very effectively in most mares within 24 to 48 hours,” he said. This is important because when the embryo comes down into the uterus from the fallopian tube about 5.5 days after breeding, the uterus should be a good environment for its survival and maturation.

“The inflammatory response to sperm is what triggers the mechanism for clearing the uterus and is a normal response,” continued Troedsson. “But some mares don’t clear the uterus effectively and develop a persistent breeding-induced endometritis. If challenged with bacteria or with semen, they fail to clear the uterus.

“We now know this is caused by an impaired physical mechanism,” Troedsson explained. “The uterine muscles fail to contract effectively during the peak of inflammation. Our study a few years ago showed this is mainly caused by overpro-



Mare owners should always be thinking about the next breeding season

duction of nitric oxide—an inflammatory mediator. This causes relaxation of the uterine muscles rather than contraction. Prostaglandin is another inflammatory mediator, but it causes the muscles to contract. We believe this is what clears the uterus and that there's an imbalance between the nitric oxide and prostaglandin in these mares. This can be side-passed by giving these mares a uterine lavage—one or two liters of buffered saline solution—often combined with administration of oxytocin, which is another hormone that causes uterine contraction. Using this type of treatment we are now more successful in getting these mares pregnant than we have been in the past.”

Bailey says the flip side of the coin is the infectious problem. “Biopsies in this instance usually show an inflammatory cell type associated with bacteria or fungus, and a culture will hopefully give us the answer as to what bacteria or fungus might be present,” he said. “We also do sensitivity tests to determine which antibiotic the bacteria are sensitive to. Then we can make a good choice of antibiotics for treating the mare.” He likes to use systemic treatment (pertaining to the whole body), rather than just relying on uterine infusions, and he might keep mares on



MATHEA KELLEY

Modern technology helps veterinarians examine broodmares for potential problems

systemic antibiotics for a 10-day period, “It’s important to correct any bacterial or fungal conditions or she will not carry a foal,” Bailey continued. “Cultures are not always accurate indicators, however. There will be some false positives if contaminants are picked up when taking the sample, and some false negatives—if you

can’t get the bacteria to grow on laboratory media. The veterinarian has to look at the entire clinical picture. Many times we may not get something to grow, but are convinced that something is there and we’ll attempt to culture it. Sometimes we’ll lavage the mare and culture the lavage fluids and have success. It’s not always

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as simple as just pulling a culture and getting all the answers.”

Pseudomonas, *Klebsiella*, *Streptococcus equi*, and *Escherichia coli* are the four main pathogens found in mares. “Many

times we might culture other things and just evaluate the whole picture—to determine if it’s a problem or just a contaminant,” Bailey said.

He notes that veterinarians might find fungal infection, and some excellent drugs are available for intrauterine use that might clear up some of the worst infections, such as *Aspergillus*. “We have some very good drugs like clotrimazole for clearing up some of these mares that in the past were very difficult to treat,” said Bailey.

Also available are fluids that buffer and set the bacteria up for the antibiotic to work better. “We have more tools in the cupboard today to treat some of these things,” said Bailey. “But sometimes we must be very persistent. One cycle of therapy may not get the cure accomplished, especially in the older mare.”

Troedsson says practitioners and researchers are shedding new light on these problems. “Most cases are easy to treat with antibiotics in the uterus, but we’ve



Eastern tent caterpillars are believed to have caused Mare Reproductive Loss Syndrome

always had some mares that even though their next culture comes back clean, they are infected again after their next cycle,” he explained. “We haven’t really understood this, but there have been speculations the last couple of years that maybe the uterine lining is building up a bio-film. This is bacterial growth on a solid surface, with several different kinds of bacteria that help each other and build a matrix in

a kind of plaque. This makes it very difficult for any antibiotic to penetrate and be effective against them.

“This has been well-described in the human mouth and urinary bladder, explaining why some urinary infections in humans are hard to eliminate,” Troedsson continued. “The bacteria have found a way to build a structure around themselves to protect against being reached by antibiotics. It’s been speculated that the same thing may happen in the uterus. This has led many practitioners to combine antibiotic treatment with other chemicals aimed at breaking down these bio-films.”

Danish researchers at Copenhagen’s veterinary school recently found that some bacteria that invade uterine tissues are present in a dormant state, which makes them difficult to reach with antibiotics. “They may, for reasons we don’t understand, wake up and cause a problem, then go back to dormancy and become resistant to antibiotics,” said Troedsson. “The key here would be to try to combine antibiotic treatment with something that stimulates these bacteria to get out of hibernation and become more accessible to the antibiotic. Research on infectious endometritis is improving our efficiency in treating these mares”

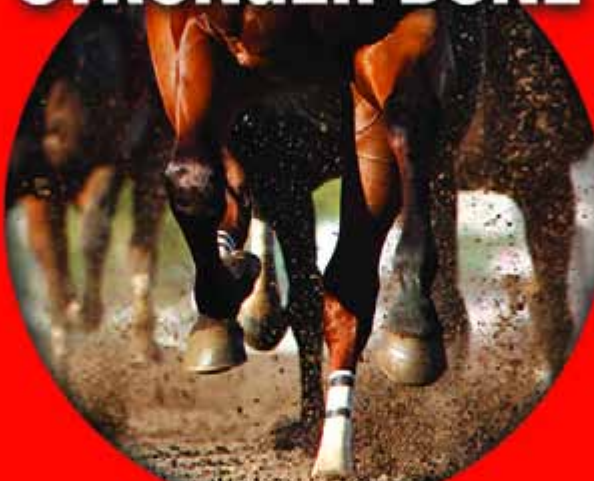
POST-FOALING CHALLENGES

“Another area we look at is post-foaling mares that will be rebred,” said Bailey. “Some of the problems we experience in post-foaling mares are in individuals that take a longer time than normal to shed the placenta (directly after foaling). If the mare has not shed her placenta within two to three hours, we begin assisting her medically, and later on sometimes with manipulation. Monitoring and getting rid of the placenta are very important in working toward easy breeding post-foaling.”

Many studies have shown that a lot of post-foaling antibiotics are not helpful in achieving higher conception rates at foal heat or the next heat. “But we do feel it is very important to do a lavage of the uterus and examine the cervix digitally, to see that it has not been damaged during foaling. Also, these mares usually benefit greatly from a Caslick’s because they don’t have much vulvar tone and we can prevent aspiration of whatever is in the environment,” said Bailey.

“Getting rid of the placenta, ascertaining whether damage has been done internally, and suturing the vulva rather quickly post-foaling (at least the next day), are very important,” he continued. “We evaluate all mares at foal heat (the first heat period after parturition). Many mares just take more time than nine to 12 days for the uterus to involute or shrink, and to stop pooling fluids, and become more able to conceive and carry a foal.

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Most mares that are still pooling fluid in the uterus at foal heat should be helped with treatment, as opposed to being bred at that time. Some mares may have a lingering infection that needs to be cleared up, and some may just need oxytocin to help with uterine clearance.

"After the foal heat, we are looking at the same things," Bailey noted. "We are always monitoring during the heat cycle for accumulation of fluid or any discharge through the cervix. Overall, the wet mares have a lower conception rate than dry mares. They just take a little longer, especially the older mares, to get back in shape for breeding."

HORMONAL CHALLENGES

Mares with hormonal problems generally can be divided into two categories—those that fail to cycle and those that cycle but have problems becoming pregnant. Mares are seasonal breeders, and most of them stop cycling during winter. "Physiologically they don't start cycling again until the end of April, even though breeding season will be from mid-February through May," said Troedsson. Most managers put mares under lights or use hormonal treatments to get them cycling early. Otherwise, the majority of mares are not fertile at the start of the breeding season.

Mares often start to show heat about a month before they actually cycle and ovulate. "At some farms, people start to breed mares too early, when they show heat," said Troedsson, who reminds us of the natural post-breeding inflammation discussed earlier. "If the mare is repeatedly bred during her transitional period, however, this can create repeated inflammation challenge to the uterus that may become chronic even after she starts cycling normally. She already has a very challenged and inflamed uterine lining. These mares not only fail to become pregnant when bred too early in transitional heat, but the repeated breedings also create a problem that reduces their ability to become pregnant later." In a well-managed breeding program, however, this occurrence is rare because veterinarians are closely monitoring mares for ovulation, and the mares are not bred unless they are actually cycling.

"Then we have the mares that don't start cycling," added Troedsson. "We are seeing more of this problem than in the past, and we don't always know why they don't start cycling. One reason, recently described, is a condition called persistent endometrial cups. These cups are formed in the uterine lining during pregnancy at about 37 days and persist until about 120 days (normal gestation length for mares is 325-360 days). They produce hormones to maintain the pregnancy. Mares do not cycle when they have these endometrial cups. If a mare loses the pregnancy for some reason after



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Day 37 and the endometrial cups remain, she won't start cycling again.

Troedsson continued, "This was one of the problems we found with MRLS (mare reproductive loss syndrome, a storm of early fetal losses and late-term abortions experienced in 2001 and less in later years,

mostly in Central Kentucky). Mares lost their pregnancies after they'd formed these endometrial cups and didn't start cycling again for at least 120 to 150 days, and by then the breeding season is over. Mares that lost their pregnancies could not be bred back again that year.

"We discovered that even though some of these mares went on and foaled normally, they sometimes had persistent endome-

trial cups throughout the pregnancy and even after foaling," he continued. "Thus, they didn't come back into heat after foaling. This has been shown to be one cause of mares that don't cycle during breeding season, and we don't yet have a very good way to treat them.

"The endometrial cups invade the uterine lining, and you just wait for the mares to come out of this and resolve on their own," said Troedsson. "There have been some attempts to remove the cups using laser surgery and also some hormonal treatments, but none of these efforts have been very successful."

Bailey says that sometimes it's necessary to treat the broodmare with Cushing's syndrome. "We look at many hormones on the problem mares," he noted. "We can measure and treat problems in the thyroid, and many times we have to look for a cyclical problem—measuring hormones in various areas.

"We also see mares that have lactational anestrus and do not cycle," he added. "And some mares, even though they may be under lights or in the natural breeding season, don't start cycling. There are many therapies to try to assist these mares, but none of these therapies are uniformly successful. Often mares that respond to one form of treatment don't respond to another. Some mares respond to follicle stimulating hormone, and others may respond to sulpiride after estrogen priming. (Sulpiride is used as an anti-psychotic in humans, but its antagonistic effects on dopamine levels encourage milk production in horses.) There are many regimes that different veterinarians have worked with. Some methods seem to give results, but it's very difficult to study any of these treatments. It's hard to set up a study model where you could have controls because you don't know which mares are going to start cycling on their own, and which are cycling as a result of the therapy. Hormonal or cyclical abnormalities can be some of the most difficult things to treat.

Some mares at their first pregnancy diagnosis are found to have insufficient progesterone to maintain pregnancy. "It's fairly routine to do progesterone assays at a mare's first pregnancy examination to determine if she has adequate levels," explained Bailey. "If not, the mare can be supplemented (with a variety of methods of supplementation of progesterone), to safeguard the pregnancy."

TAKE-HOME MESSAGE

For successful breeding and a healthy pregnancy, it is crucial to check mares well ahead of the breeding season and continually monitor them throughout pregnancy. This gives you a chance to detect and correct any problems that might interfere with that success.

Ovarian Cysts and Tumors

Occasionally, a veterinarian might detect ovarian cysts in a mare; these cases can have a variety of outcomes. "We see cysts that have no adverse effects on reproductive health. I know of one mare that's had a big cyst on her ovary for four years and it has never bothered her; she is very normal," said Dr. James Bailey, a practitioner with Royal Vista Southwest, an equine reproduction-focused practice in Purcell, Okla. "Some ovarian tumors will prevent a mare from cycling, but these are fairly rare. For instance, in 1,300 mares this year I only saw one with a tumor."

Reproduction specialist Dr. Mats Troedsson says a granulosa cell tumor on one ovary can have an effect on the other ovary, causing the mare to stop cycling. He says these tumors are fairly easy to diagnose by using palpation, ultrasound, or hormonal assays for inhibin (a protein complex that downregulates follicle-stimulating hormone, or FSH, synthesis and inhibits FSH secretion), testosterone and progesterone. All three of these can keep the mare from ovulating.

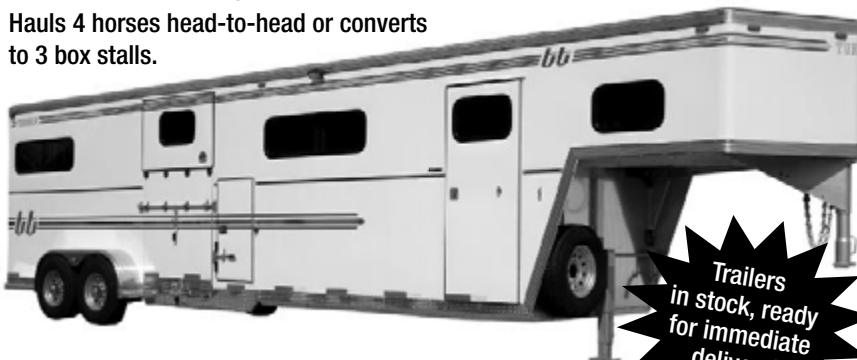
The tumors can be easily removed, Troedsson noted. "Then the mare will eventually start cycling again," he added. "This condition is fairly easy to treat, but if diagnosed during the breeding season and the tumor taken out, it can take several months—sometimes up to a year—before the mare is cycling normally again, so you may lose that breeding season." —Heather Smith Thomas

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