

Preparing Your Mare for Breeding Season

As Spring approaches, a few things should be considered in preparation of your mare for the breeding season.

Mares enter the breeding season from many different backgrounds. A mare's history is important in determining her management through the breeding process. The categories or classes of reproductive status include: **foaling** (pregnant), **maiden** (never bred), **barren** (bred without conceiving), **slipped** (aborted) and **not bred** (has had foals in the past, but was not bred during the previous season).

Management Based on Class

Foaling mares – these mares need to be examined after foaling to ensure that the uterus is healthy, free of excess fluid, abrasions, cervical lacerations or placental remnants and that she has begun to cycle normally. Most mares that foal during the regular breeding season cycle normally, having their first ovulation (“foal heat”) approximately ten days following foaling. Subsequently, these mares cycle normally. Mares that foal early in the year may have their expected foal heat ovulation, and then stop cycling until daylight length increases in the Spring. Foaling mares certainly may be bred on foal heat with normal pregnancy rates. For fertility to be optimized, ovulation needs to occur ten days or greater after foaling to allow the uterus time to involute (return to pre-pregnancy size and structure) before the embryo enters the uterus (five days after ovulation). If a mare is bred and ovulates on day 10 post-foaling and subsequently conceives, the embryo enters the uterus on day 15 after foaling, arriving in an environment suitable to sustain the pregnancy. If the mare is predicted to ovulate earlier (e.g., on day 7), the uterus will not be fully prepared to support the embryo and early embryonic loss is more likely. These facts are important to consider when substantial cost is involved with each breeding as may be the case with frozen or cooled-shipped semen. Foaling mares should have uterine culture and cytology performed to ensure she is not harboring a uterine infection that could decrease fertility. Generally, cultures performed during foal heat can lead to confusion as the reproductive tract is still contaminated with bacteria from the birthing process; however, cultures can be performed during this time if the practitioner is mindful that non-pathogenic bacteria (those not causing disease) may be recovered and do not warrant treatment. Foaling mares may require uterine lavage (flushing), antibiotic infusions and oxytocin (to encourage uterine contractions) post-foaling to prepare for the upcoming breeding. Uterine biopsies are generally not recommended in post-foaling mares unless there is a specific concern that arises during a veterinary examination.

Maiden mares – young maiden mares are generally healthy and have good fertility. Many young maiden mares enter the breeding season without having uterine cultures or biopsies performed and conceive with normal pregnancy rates. At the minimum, young (less than 5 years of age) maiden mares should have a rectal palpation and ultrasound examination performed to ensure she is reproductively healthy with no signs of ovarian or uterine disease. A uterine culture is optimal in this class of mare to document that the

mare is starting the breeding season free from uterine infection. Older (greater than 5-7 years of age) maiden mares deserve a little closer examination prior to their first breeding. Older maiden mares sometimes develop uterine abnormalities, maybe from disuse, that discourage optimal fertility. Examples include uterine gland distension and periglandular fibrosis seen as abnormal filling of and scar tissue formation around the uterine glands which nourish the early conceptus. These abnormalities can not be seen during an ultrasound exam and can only be detected by examining a uterine biopsy with a microscope. Additionally, the conformation of the mare's vulva should be examined to determine if she aspirates air into her vagina ("windsucker"). This conformational fault needs to be addressed at the time of, or immediately after breeding with a "Caslick's" suture to prevent air aspiration and ultimately infection of the reproductive tract.

Barren mares – barren mares are those that did not conceive the previous year. Failure to conceive occurred for a reason, maybe at no fault of the mare but warrants some investigation to rule out the mare as a cause. Uterine culture, cytology and biopsy are all indicated for this class of mare. Additionally, progesterone samples and/or supplementation should be employed to ensure optimal fertility. For these mares, progesterone (the hormone that supports pregnancy) is usually supplemented starting after ovulation and continued until the first pregnancy examination. If the mare is pregnant, a blood sample is taken to measure how much progesterone the mare is producing on her own, while supplementation is continued until laboratory results are in. These mares are generally treated more aggressively (e.g., pre- and post-breeding lavage, uterine infusion, oxytocin treatment, Caslick's application and progesterone treatment) than normal mares are.

Slipped – mares that aborted the previous year are managed very similar to barren mares with uterine biopsy, uterine culture and cytology prior to breeding. Additionally, progesterone supplementation and Caslick's suture placement are usually performed after breeding in this group of mares. Progesterone supplementation may be performed for the entire first 5 months in some of these mares as the medication has extremely low side effects and the cost is inexpensive in comparison with pregnancy loss. Laboratory testing can help confirm if these mares need to stay on progesterone supplementation.

Not bred mares – generally, these mares are reproductively normal mares that for whatever reason were not bred during the previous season. Depending on age and findings during the pre-breeding ultrasound exam, these mares should at least have a uterine culture and cytology performed. The mare's reproductive history, age and clinical findings will determine if she would benefit from more diagnostics such as uterine biopsy or uterine treatments.

A Closer Look at the Diagnostics

Uterine culture involves using sterile technique to retrieve a small sample of uterine secretions in order to "culture" (incubate at body temperature on a growth media plate) the sample for detection of harmful bacteria and/or fungi. Figure 1 shows the appearance of *Klebsiella pneumoniae*, one of the four major uterine pathogens, growing on a blood

agar plate. Figure 2 shows another important bacteria, *Escherichia coli*, on the same type of culture plate.

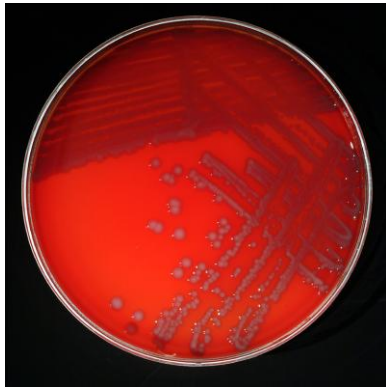


Figure 1

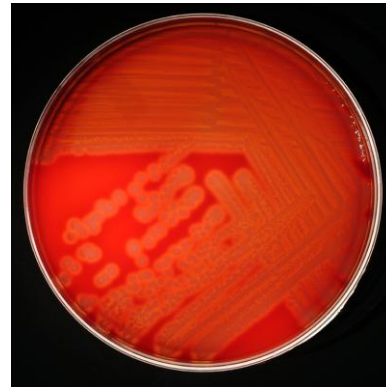


Figure 2

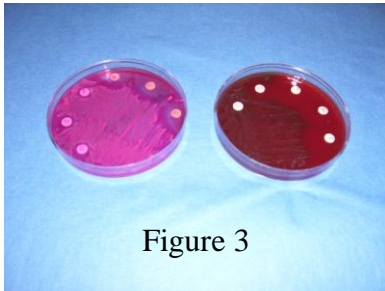
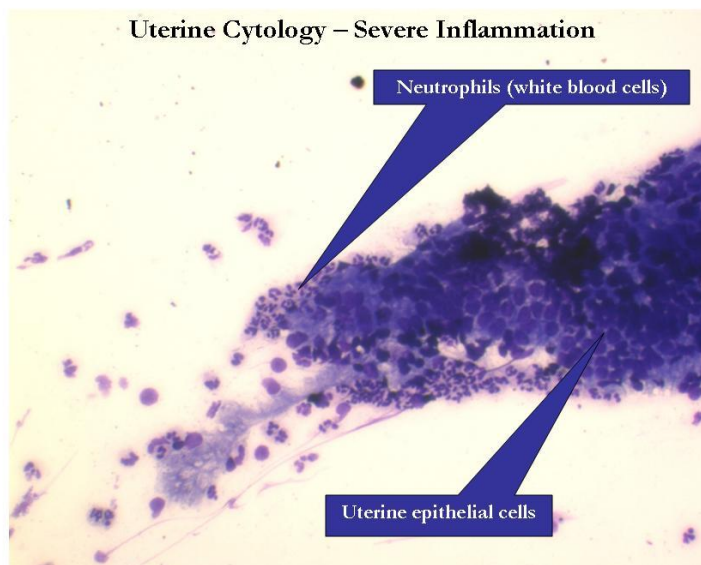


Figure 3

Antibiotic sensitivity testing of cultured organisms guides our treatment of endometritis or uterine infection. Figure 3 shows antibiotic impregnated discs being used to determine which antibiotic inhibits bacterial growth. Notice the areas free of bacteria around some of the discs, these antibiotics will be used to treat this mare's uterine infection.

Uterine cytology is essentially a smear taken to determine if inflammatory cells are active within the lumen of the uterus. Cytology samples are generally taken simultaneously along with the culture sample. Samples are placed on a microscope slide, stained and viewed under a microscope to detect what cellular type is present. Figure 4 (below) shows a cytology sample the exhibits severe inflammation and most likely uterine infection. The inflammation is evidenced by the presence of a large number of neutrophils, a type of white blood cell involved in the early stages of infection. Uterine cytology offers a quick in-house prediction of uterine infection status.



Uterine biopsy is currently the “Gold Standard” for determining the health status of the equine uterus. Biopsy examination allows us to determine the status of the uterine lining, endometrial glands, scar tissue, microscopic cysts and inflammation. Figure 5 (below) shows a uterine biopsy with widespread uterine gland distension.

Endometrial Biopsy 1200X Magnification

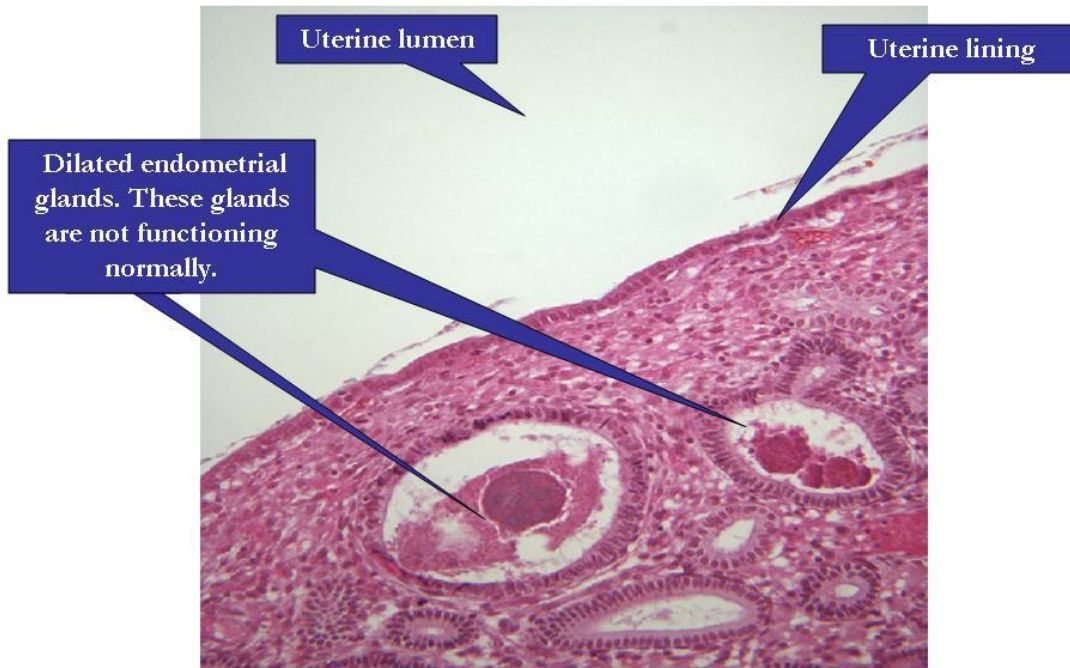


Figure 5

The mare with this type of biopsy would benefit greatly from uterine lavage and oxytocin before, during and after breeding to encourage uterine contractions and gland function.

Endometrial Biopsy 1200X Magnification

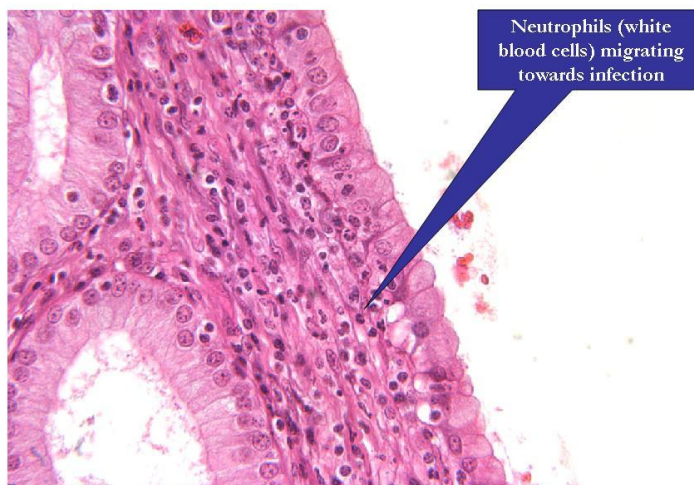


Figure 6

Figure 6 (left) shows a biopsy with a large number of white blood cells (neutrophils) migrating from the tissue towards the lumen or cavity of the uterus. These cells are migrating towards the cause of the inflammation, usually infection. This mare would benefit from uterine lavage, antibiotic infusions and oxytocin for uterine clearance of bacteria and debris.

Figure 7 shows an endoscopic (long flexible camera) view of a large uterine cyst. Cysts this large, especially when occurring in groups can easily impact fertility.

Figure 8 shows an ultrasonographic view of excessive fluid in the uterus. This mare would benefit greatly from uterine lavage, oxytocin and uterine infusions of antibiotics.

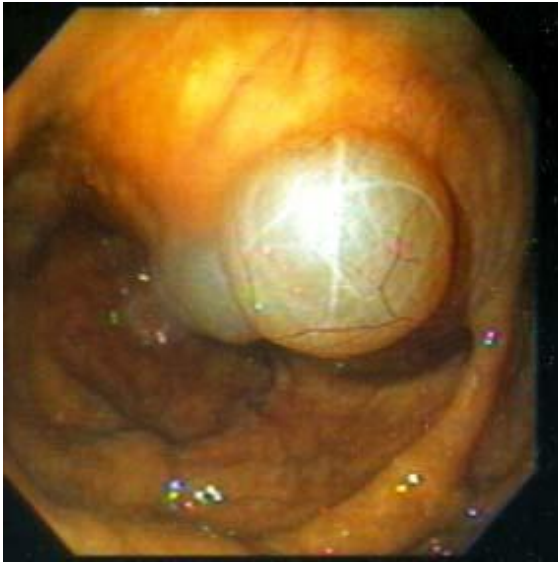


Figure 7

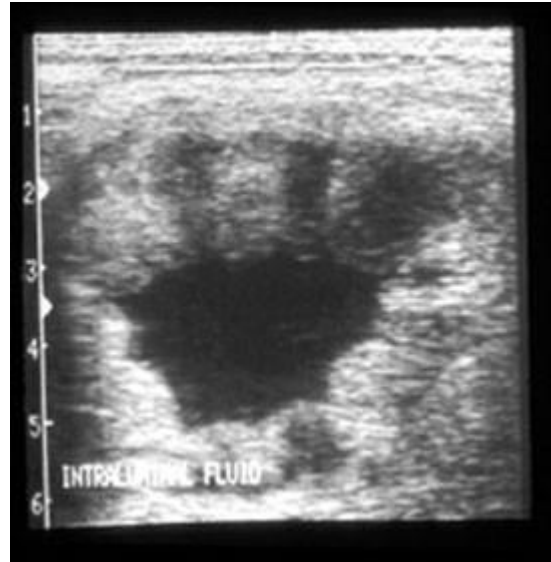


Figure 8

Lastly, What You Can Do at Home

Ensure your mare is current on her vaccinations, deworming and Coggin's test and is on a good plane of nutrition.

Arrange for transport of your mare to the veterinary clinic or breeding facility at which she will be inseminated. If your mare is to be inseminated at your home, arrange for timely house calls by your veterinarian to monitor the mare's cycle.

Familiarize yourself with the breeding contract associated with the stallion you are planning on breeding your mare to. Pay attention to shipping instructions, requests for semen delivery, return of shipping containers, costs associated with shipments, costs of container return, etc.

Ensure that you have all the shipping instructions for frozen or cooled-shipped semen arranged for your veterinarian or person performing the insemination. For frozen semen, make arrangements for the short or long-term storage of the frozen semen.

Possibly most importantly, provide your veterinarian or breeding manager with a copy of your stallion contract so that he or she may contact the stallion owner or manager ahead of time to coordinate shipping details, contact information and to discuss any details unique to that stallion or his semen quality.