

Breeding the Older Mare

By Dr John Kohnke BVSc RDA

Many owners of performance and show mares would like to breed a foal from an aged mare so that they can continue a successful or winning bloodline. Mares can retain their fertility and ability to breed until their mid to late twenties. However, by their early 20's, older mares only have a 30 percent chance of getting in foal and maintaining their pregnancies, and generally have to be bred twice as often to become pregnant, as compared to younger mares.

Surveys suggest that mares over 13 years of age start to decline in fertility, taking more cycles to get in foal, with a higher risk of early embryonic abortion. However, these trends are biased by the fact that there are not as many older mares at stud and fewer foals are born to aged mares in proportion to the total number of foals bred in a season. Some authorities argue that a healthy older mare's fertility and conception rate is not significantly less than a younger mare, but that maintaining a viable and full-term pregnancy is more difficult due to changes in the uterine environment, reduced ability to resist infection and a less functional uterine wall.

Endometritis is more common in older mares due to low grade infection introduced at natural service. Well managed AI can significantly reduce this risk in older mares. In fact, retained uterine fluid and endometritis is more common in older maiden mares as compared to mares that have previously had foals.

It is also a common belief that the quality and athletic performance of a mare's progeny decline as she ages, with fewer chances of breeding an outstanding racing or performance horse from an older mare. A less functional uterine wall may result in reduced nutrient transfer due to placentitis, endometritis, scarring from a previous foaling, low grade uterine infection or previously retained membranes, which may all affect the size at birth of a foal born to an older mare. After birth, a young foal born to an aged mare may not thrive or grow as well due to lower quality colostrum, reduced milk quality and quantity produced by the mare. However, many highly successful racing, performance and show horses have been bred from older mares.

Common Reproductive Problems in Older Mares

The most common causes of a reduced rate of conception and an increased risk of early embryonic abortion (EEA) in older mares include **poor clearance of uterine fluid, changes in the slope of the vulva** with risk of aero-vaginitis from vulval 'wind-sucking', **loss of muscle tone in the uterine wall, lowered natural immune defence** in the womb to control

infection introduced at service, **deterioration in egg quality** over 20 years of age, **general poor health, recurring chronic infection** and **poor nutrition**. Older mares with the pituitary gland enlargement form of Cushing's Disease are also unlikely to conceive or maintain early pregnancy due to the influence of high blood levels of cortisol hormone which interferes with progesterone and other hormones.

The Older Maiden Mare

Although it is a common belief that older mares which have not been bred previously should have the same ability to conceive and maintain pregnancy as compared to mares which have had foals earlier in life, this is not the case. Older maiden mares, which have not had a foal previously, appear to be more susceptible to uterine wall inflammation (endometritis), even though they are healthy in every other aspect. Older maiden racing and performance mares which are retired at 8-10 years of age, are often more difficult to get in foal than younger mares which have not been in training, or successful mares retired at an earlier age.

Biopsies of the uterine wall of older maiden mares often reveal endometritis (or fibrosis of the lining cells of the uterus) and significant glandular degenerative changes.

Retention of abnormal amounts of uterine fluid is also more common in older maiden mares. Dr. Jonathon Pycock, a leading UK horse breeding veterinarian, considers that an older maiden mare is more likely to have an abnormally tight cervix which fails to relax adequately during oestrus, as compared to a mare which has had one or more foals. The tight cervix allows uterine fluid to be retained and accumulate within the uterus. Although the fluid itself may not harbour a bacterial infection or contain high levels of inflammatory cells, it is his belief that after breeding, the amount of fluid retained in the womb increases in the older maiden mare. This is partly due to poor lymphatic drainage and reduced uterine wall muscle tone or ability to contract to expel the fluid, both of which results in increased uterine fluid volume of up to 1000 mL (1 litre) in severe cases, compounded

Handy Hint

Take Routine Swabs of Older Maiden Mares Prior to Breeding

Routine swabs for bacterial culture at the onset of the heat cycle and biopsy of the uterine wall in older mares with a history of poor conception or abortion are commonly collected to evaluate the viability of the uterine environment. Ultrasound examination to assess the volume of retained fluid when monitoring follicle development and the optimum time for breeding, and with drainage of excess fluid if necessary, will also improve the overall chances of an older mare, especially an aged maiden mare, of getting in foal and retaining her pregnancy by reducing the risk of early embryonic abortion.

Breeding the Older Mare

by the tight cervix and the difficulty in draining the fluid. Excess accumulation of fluid and inflammatory exudates interferes with passage of sperm through the uterus into the oviducts at service or insemination and also affects the viability of the fertilised egg on its return to the uterus 3-5 days after breeding.

Managing the Older Mare to Improve Conception

There are a number of important management procedures which should be adopted when breeding the older mare. Dr. Jonathon Pycock suggests the following management aims.

1. Correct vulval conformation abnormalities.
2. Ultrasound examination of the uterus.
3. Treatment before and after breeding.
4. Strict breeding hygiene techniques.
5. Correct timing of breeding.
6. Limit to one service or insemination only.
7. Ensure adequate nutrition prior to and after breeding.

A high proportion of older mares develop endometritis after breeding and careful management is required to reduce the risk and control uterine inflammation and fluid accumulation after breeding.

1. Correct Vulval Conformation Abnormalities

In a healthy, normal mare, the lips of the vulva provide a seal and initial barrier against infection. As a mare ages, even an older maiden mare, the vulva is prone to 'sinking' in under the anus, especially in mares in poor condition leading up to breeding. Droppings are collected on the lower ledge during defecation and this increases the overall likelihood of contamination with B-haemolytic *Streptococcus*, *E. coli* and other potentially colonising bacteria normally present in the droppings. If the vulva conformation is sloped inwards, or the seal between the sides is damaged by prior foaling, or poor or repeated Caslick techniques from prior breedings, then air and contamination can enter the vagina and ascend into the uterus when the mare comes into season.

Handy Hint

Increasing Energy Intake Prior to Breeding

Providing an increasing plane of nutrition over the 4-6 weeks prior to breeding may help to increase overall fertility.

Surveys also indicate that the chances of conceiving a filly foal is higher (47% colts to 53% fillies) if a mare is healthy, but in thin condition at breeding, but this lower condition may reduce the success of her cycling, ovulating and conceiving.

Ideally, the mare should be fed to gain condition, at least one condition score point, during the pre-breeding period. Providing increased energy by adding 1-1½ kg of oats daily to the ration of a 500kg mare, for example, will help to improve condition. Higher amounts may need to be given, along with hay during the winter months, to maiden or dry mares to help increase their body condition and reduce the inward slope of the vulva prior to breeding.

When a mare gallops, air can be aspirated into the vagina (referred to as pneumovagina), along with bacterial contamination, resulting in drying and inflammation (vaginitis), progressing to inflammation of the cervix, endometritis and uterine infection. This is referred to as aero-vaginitis due to vulval 'wind sucking'. Reduced uterine immunity in older mares can result in chronic low grade uterine infection and failure to conceive or early embryonic abortion. If the mare has an inward vulval slope, despite being in good condition, then a Caslick's operation should be considered.

Urine 'pooling' in the lower part of the vagina due to forward movement and loss of muscle tone in the breeding tract in older mares, is also a cause of cervical inflammation and chronic uterine infection. In severe cases, surgical correction to elevate the cervix and facilitate drainage and prevent urine flooding forward is possible in a valuable mare. Maintaining good body condition is also helpful as it positions the vagina and uterus at a higher angle and allows urine to be flushed to the rear instead of pooling forward and collecting in the cervical area.

Handy Hint

Caslick before Breeding and Immediately Following Breeding

Normally, a mare with good vulval conformation should not be Caslicked, as eventually scarring and thickening of the vulval seal will occur on repeated Caslicks and in old age, scarring can damage the vulval seal and increase the risk of pneumovagina and endometritis. However, where a mare has chronic uterine infection, and has been swabbed and treated appropriately, then it is good practice to infuse with selective antibiotics when she is in season, Caslick the vulva and miss one seasonal cycle to facilitate natural uterine cleaning. This program utilises the increase in uterine immunity during the intervening cycle to improve the uterine environment. It is best to leave the Caslick intact up until the day of breeding, open the vulva for breeding and re-stitch the vulva after breeding or insemination. In severe cases, reconstructive surgery of the vagina and vulval area, with injections of fat to make the vulva more prominent with a lesser slope, can be carried out in a valuable mare.

2. Ultrasound Examination of the Uterus

It is important to only breed when the uterus is clear of uterine fluid. This is important when planning to breed a mare on her foal heat, 9-12 days after foaling, as studies have shown that often a failure to conceive after a foal heat mating is related to excessive retention of uterine fluid in recently foaled mares. An ultrasound performed at the onset of the 'seasonal' cycle is helpful in determining the volume of intra uterine fluid. Dr. Pycock has found that even if this fluid is sterile and free of infection fighting cells (neutrophils), mares with more than 0.5 cm depth of fluid trapped in the uterus, have a reduced chance of conceiving and maintaining an early pregnancy. In these mares, administering 10-20 IU of long acting Oxytocin hormone intravenously per 500kg bodyweight, as supervised by your vet, will help expel the retained fluid without affecting subsequent ovulation. A follow-up ultrasound within 24 hours and a repeat injection of Oxytocin, if necessary, can be carried out to check for and eliminate excess fluid. Consult your vet for advice.

Breeding the Older Mare

In years long gone by, infusions of colostrum to assist uterine immunity, kerosene or weak iodine flushes were popular to help treat low grade uterine infection. However, in recent times, irrigation with large volumes of saline to expand the uterus and allow flushing of the deeper folds in the wall to clear infection, combined with careful use of selected antibiotics determined by swabbing the cervix and uterus, has been shown to result in improved cleaning, less risk of irritation and effective control of uterine infection.

It is also helpful to allow at least one heat cycle after treatment, if possible, without breeding (sexual rest), especially from natural service, to help improve and establish optimum uterine health before rebreeding with low volume, fresh semen using AI techniques.

If the follow-up ultrasound detects retained uterine fluid, Dr. Pycock recommends manual cervical dilation and catheterisation to assist fluid clearance, especially in older maiden mares.

Handy Hint

Flushing the Uterus before Breeding

It is unwise to routinely infuse and flush the uterus with antibiotics just prior to breeding or insemination, as they may have an irritant and spermicidal action.

Flushing the uterus (uterine lavage) is best carried out with warm sterile saline, containing small doses of Prostaglandin F2 alpha, strictly supervised by your vet only, to help the combination of isotonic saline and prostaglandin infusion to flush and expel the uterine fluid. This technique carried out prior to breeding has been shown to be more effective in eliminating fluid and bacteria, than using antibiotics alone to control bacterial contamination. In the 8-12 hours prior to breeding, uterine lavage in this way has also been shown to be less likely to cause uterine inflammation, which can result from an infusion of antibiotics.

3. Treatment Before and After Breeding

An ultrasound examination at 24 hours after breeding will help to evaluate the amount and viscosity of any uterine fluid. If more than 2 cm of uterine fluid is detected, the uterus can be flushed with 1-2 litres of warm buffered saline using a specially designed uterine flushing catheter.

The fertilised egg does not return to the uterus for 3-5 days after breeding, so post-breeding flushes can be carried out without risk of damaging the conceptus, but these must be performed under supervision of your vet. If clearance of the uterine fluid is slowed or incomplete, a small dose of Oxytocin can be administered.

Following the saline infusion, a low volume infusion of water soluble antibiotics can be given to assist in controlling residual infection introduced at service. Large volumes are not recommended as they can result in uterine inflammation and irritation.

If the mare has been Caslicked, then the stitches should be replaced after these infusions. Overuse of antibiotics should be avoided as fungal colonisation in the uterus can occur in older mares with poor uterine immunity or a history of chronic uterine infection.

4. Strict Breeding Hygiene Techniques

It is important to restrict speculum or other visual internal examination before breeding to limit the risk of introducing infection or air, which may dry out the vaginal or cervical area. Air introduced during speculum insertion should be expelled by rectal palpation after examination. In fact, careful sterile gloved digital examination of the cervix is preferred to visual speculum appraisal in older mares to reduce the risk of infection.

In an older mare which has recently foaled and is being rebred, examination of the cervix and vagina for lacerations etc should be carried out to determine damage that could increase the risk of bacterial contamination and endometritis. It has also been observed that AI with freshly collected semen, administered using strict hygiene techniques as detailed above, is less likely to result in post-breeding endometritis as the volume of ejaculate is lower than natural service and minimal contamination if any, is introduced at insemination.

Handy Hint

Clean the Vulval Area before Breeding

The vulva and perineal area should be thoroughly cleaned with boiled water or sterile saline which has been cooled, sprayed on with a pressure sprayer and the area dried off using a hair dryer. Avoid using tap water as it is often high in *Pseudomonas spp.*, and do not use disinfectant washes, as these can eliminate sensitive bacteria and allow pathogenic bacteria to create an unchallenged infection. Obviously tail bandages should be applied for natural service and even for AI to limit risk of contamination.

5. Correct Timing of Breeding

It is essential that the older mare with reduced uterine defence and risk of endometritis is bred at the optimum time. This can be predicted by a combination of ultrasound and per-rectal manual examinations of the ovaries and uterus.

Early insemination before ovulation allows time for clearance of uterine fluid as sperm are viable for at least 72 hours after service or insemination. The natural uterine immune defence system is heightened at the time of ovulation, and well timed early insemination can utilise the increased immunity to help control post insemination endometritis and infection.

Early insemination also allows at least one post insemination flushing of the uterus, as outlined above, to help improve the uterine environment before the conceptus returns from the oviducts 4-5 days after fertilisation.

The important concept is to breed prior to ovulation, which is possible with AI, so that the uterine environment can be cleaned and made-ready for the arrival of the conceptus.

6. Limit to One Service or Insemination Only

As outlined above, the risk of introducing infection and endometritis, is increased by multiple breedings or inseminations in critical mares with a history of endometritis and early embryonic abortion.

Therefore, the mare should only be inseminated once and all effort made to ensure that the uterus is clean and ready to receive the conceptus.

Breeding the Older Mare

7. Ensure Adequate Nutrition prior to and after Breeding

As discussed above, planning an increase in energy intake to provide a rising plane of nutrition may be worthwhile in dry mares at pasture over winter, as well as wet mares with lactation drain and subsequent reduction of ovarian activity if they are losing weight when nearing their peak of lactation at 4-10 weeks after foaling.

A supplement which may be of benefit is **Kohnke's Own Activ-8™**, which contains organic selenium, Vitamin E and Vitamin A, as well as other nutrients essential to support the immune system, especially in mares on winter pastures which may be low or inadequate in these nutrients. If Activ-8™ is supplemented daily for a month before breeding, then there is no need to double up with **E-Se Supplets™**, as they both contain Vitamin E and organic selenium. Supplementing with Activ-8™ for a month prior to and after breeding, may be worthwhile in older mares with low natural immunity and history of endometritis, to assist their general immune status. Studies have shown that oral supplements of dried colostrum antibodies given to assist immunity, which often claimed to have benefit, have no practical advantage to assist immunity in horses.

The take home message is to check for uterine fluid, flush and remove before a mare comes into full season, adopt strict hygiene at service or insemination (AI with small volumes of fresh semen is preferable in older mares) and evaluate by ultrasound before and after breeding to check for the amount of uterine fluid and treat if necessary after insemination. Careful appraisal of vulval conformation, urine pooling and use of a Caslicks if necessary, as well as providing an adequate and well balanced diet, are all helpful in getting an older mare in foal.

Handy Hint

Supplement with Vitamin E and Selenium

Studies have shown that limited or low dietary intake of phosphorus, selenium, Vitamin A and Vitamin E, besides energy and protein can be associated with reduced fertility in mares. Although pasture based diets and most commercial breeding rations will provide adequate phosphorus and Vitamin A, selenium and Vitamin E may still be low or inadequate to meet daily needs. Supplementing mares with a product such as **Kohnke's Own E-Se Supplets™**, to provide 1mg organic selenium and 1000 IU vitamin E daily, given daily for the last 4 weeks prior to breeding, will help in correcting a low or inadequate intake of these essential nutrients. The advantage of E-Se Supplets™ over a powdered supplement is that the small pellets do not sift-out or blow out of paddock feeders, and they are cost effective. Many breeders supplement with 15g (1 scoopful) of E-Se Supplets™ daily for the last month before breeding, with a 1.4kg pack being sufficient for 3 mares of 500kg body weight, for one month each prior to breeding.

Did You Know That...

An American breeder, Mr. Jack Walmsley in the mid 1930's, developed a theory which suggested that mares and stallions have a 4 year breeding cycle, which can directly influence the performance potential of their progeny.

He indicated, based on breeding records, that a mare's most successful breeding years were most likely when the mare was either 6, 10, 14, 18, 22 or 26 years of age! He observed that stallions were 12 months later in their "4 year cycle of success", siring more winners at 7, 11, and 15 years of age. He concluded that if a mare (say 6 years old), and a stallion was either 7 or 11 years of age, each at their 4 year cycle "high", the foal was "double cycle bred" and likely to be an outstanding race horse.

Dr. Ern Finocchio, an American veterinarian in 1985, published data which suggested that a mare's third foal, born when the mare was 7 years of age, is more likely to be successful racehorse compared to her earlier or later foals. These observations do not have any scientific or genetic basis and form the "myths" often associated with breeding horse.

There many other myths. These include claims that a mare's fertility increases on a moonlight night, the presence of a stallion next to a mare between her 'heat' cycle improves her fertility in her subsequent cycle and that older mares have defective eggs which produce foals with limb deformities. There is no basis for these claims or theories.

However, the risk of limb deviations can be associated with concurrent placental pathology or if the mare in her last trimester is fed a ration inadequate in trace-minerals, such as copper, zinc and magnesium or she is overweight and confined to a hilly paddock in late pregnancy, increasing the risk of Uterine Distortion Syndrome (UDS), which can result in a large foal being "squished" in the womb and the limbs becoming distorted and bent at the joints.