How to Decide When to Breed the Postpartum Mare

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1. Introduction

One of the primary requirements for efficient and economically viable broodmare management is the production of a foal per year, in at least 6 years out of 7.1 Although this sounds relatively straightforward, the limitations of a long gestation period (mean of 335 to 345 days), a limited physiological breeding season (March to September) and, for some breeds, the extra restriction of an arbitrary covering season (eg, February 15 to July 1 for Thoroughbred racehorses in the northern hemisphere), leaves little margin for error. Since owners will generally want consecutive foals to be born at around the same time each year, there is effectively a period of only 1 month after foaling in which to establish pregnancy. On the other hand, the postpartum period of the mare is characterized by a very early first postpartum estrus (foal-heat) that typically begins 5 to 12 days after foaling.2 Although the foal-heat presents an early opportunity for breeding, it can result in the fertilized embryo entering the uterus before uterine involution is complete and when the ability to maintain pregnancy may be compromised. Therefore, the dilemma for owners and veterinarians is to decide if they should breed at the first postpartum estrus or if waiting for a subsequent heat (with or without pharmacological induction) offers the best likelihood of not only establishing but also maintaining pregnancy. Fortunately, the decision-making process can be assisted by using the history and an initial prebreeding clinical examination to determine whether or not a mare is a suitable candidate for foal-heat breeding.3 Clearly, the arguments will be different in situations in which embryo transfer is both permissible and considered a viable option by the mare owner.

Recovery of Fertility Postpartum

The recovery of fertility postpartum is dependent on two major events: the resumption of ovarian activity (estrous cyclicity) and involution of the uterus. In the mare, the resumption of ovarian activity is extremely rapid, with the first postpartum estrus (the foal-heat) generally starting somewhere between 5 and 9 days after foaling and culminating in ovulation on days 8 to 12. However, although the first ovulation generally occurs within 15 days after foaling (90% to 95% of mares),2,4 a significant proportion of mares that foal very early in the year (>20%) show a delay of the first postpartum ovulation to beyond 20 or even 30 days.5,6 Moreover, the foal-heat appears to be a distinct biological phenomenon, and it is certainly not a guarantee that a mare will subsequently establish regular estrous cycles.
Indeed, it is not uncommon for mares to regress into anestrus after the foal-heat, which explains why many breeders are nervous about not mating at this early opportunity. While the post foal-heat regression into anestrus is often referred to as “lactational anestrus,” it is primarily a product of season and is therefore more common in early foaling mares and can be ameliorated by keeping such mares under lights from 2 to 3 months before expected foaling and ensuring that they are well fed and in good body condition.

The major reason for preferring to avoid foal-heat breeding is that mating or insemination, and indeed arrival of the embryo in the uterus (on day 6 to day 7 after fertilization; ie, approximately day 14 to day 19 after foaling), is likely to take place before uterine involution has been completed. Incomplete uterine involution will in turn increase the susceptibility to postbreeding endometritis and/or the risk of the resulting embryo entering a uterus that is not yet completely ready to support pregnancy; either of these issues could explain the reduced pregnancy rates and increased early pregnancy loss rates that have been reported in many retrospective surveys of mares bred at the foal-heat. Uterine involution is the physiological process by which the postpartum uterus regains the ability to support pregnancy; it incorporates a rapid and profound reduction in uterine size, expulsion of any foreign material or debris, and remodeling of the endometrium. In the mare, complete return of the uterus to the nongravid state, at the macroscopic, functional, and histological levels, appears to take 2 to 3 weeks, which is considerably more rapid than in other domestic species (eg, 6 to 8 weeks in dairy cattle). The rapidity of involution is presumably a function of the ease with which the relatively superficial “damage” inflicted on the endometrium by the noninvasive epitheliochorial, microcotyledonary placenta can be repaired. Nevertheless, uterine involution can be delayed significantly in mares that have complications at foaling or in the puerperal period (eg, dystocia, retention of the fetal membranes, puerperal metritis).

Deciding Whether or Not to Breed at the Foal-Heat

There are various schools of thought with regard to the desirability of foal-heat breeding. When mares foal late in the year, many owners are keen not to lose any more time and are loath to miss an opportunity to get the mare pregnant. Other breeders and veterinarians prefer to avoid the foal-heat as a matter of principle because they are worried that the chances of both establishing and maintaining pregnancy will be reduced and that a failed foal-heat breeding may even compromise fertility in subsequent cycles. On the other hand, there are also reports that fertility in the foal-heat can equal that at later estrous cycles, as long as mares are selected carefully for their suitability for foal-heat breeding on the basis of their history and an initial postpartum examination, and they ovulate at least 10 days after foaling.

As a general rule of thumb, it is better to avoid foal-heat breeding when serious complications have occurred at or around foaling (eg, placentitis, severe dystocia, retained fetal membranes, puerperal metritis), and in mares that are already considered to be at higher risk of postbreeding endometritis on the basis of experiences in the previous breeding season or on the basis of advancing age (eg, older than 16 years), multiparity, and poor general condition. A prebreeding clinical examination involving palpation and ultrasonography of the uterus and a speculum and manual examination of the vagina and cervix can also be very helpful. Clearly, if there are complications in the puerperal period (fever, abnormal vulvar discharge), immediate examination will be required and foal-heat breeding should be discouraged. Otherwise, a prebreeding examination is generally performed at around 6 to 8 days postpartum. The author prefers the later end of this range, even though it means that some mares will be missed (ie, already ovulated). Indeed, because of the indications that foal-heat breeding is more successful when ovulation occurs beyond day 10 postpartum, together with physiological reasons why this should be the case, the author generally discourages the breeding of mares that are obviously going to ovulate before day 9 to day 10; similarly, many natural mating Thoroughbred farms will not permit covering of mares before day 9 after foaling. Important aspects of the day 6 to day 8 examination include the degree of physical involution (diameter of the uterus); ideally, the uterus will be contracted and tonic despite the mare being in estrus. A large, flaccid uterus is an indicator of poor uterine involution and identifies the mare as a poor candidate for foal-heat breeding. Similarly, the presence of uterine fluid, excessive or abnormally colored cervical discharge, or damage to the reproductive tract (uterine or vaginal wall hematoma, significant bruising or tearing of the cervix or vagina) would be reasons to advise against foal-heat breeding. On the other hand, uterine cytology and bacteriology are poor indicators of suitability for early breeding because they are invariably positive even in mares undergoing normal involution. Further situations in which foal-heat breeding is discouraged include high costs or limited availability of frozen semen, marginal stallion fertility, or where the mare is being prepared as an embryo transfer (ET) recipient. In short, when there are other factors that are likely to compromise fertility, or when an optimal chance of establishing pregnancy is paramount, it may be better to wait until one can be confident that involution is complete.

Optimizing Uterine Involution in Preparation for Foal-Heat Breeding

When foal-heat breeding is desired, it is sensible to take steps to help ensure timely involution. The
Advancing the Second Postpartum Estrus

Even if there are no plans to breed the mare at the foal-heat, it is still useful to perform a day 8 to day 9 postpartum examination to ascertain whether involution is proceeding adequately, and to estimate the likely date of ovulation, thereby simplifying predictions of when the subsequent spontaneous estrus should begin, or when the mare can be treated with PGF2α, or an analogue (from day 6 after ovulation) to shorten the interestrus interval and save a few valuable days. There is much to commend this approach because the very fact that the mare’s uterus experiences the hormonal stimulation of a second estrus will be beneficial to the involution process. Of course, it is still important to ensure that other aspects of mare management (eg, lighting, nutrition, exercise) are optimal so that the risks of the mare slipping into postpartum anestrus or accumulating lochia are minimized.

Postbreeding Treatments

While opinions differ as to whether all mares bred at the foal-heat should be treated using uterine lavage, ecbolics, or intrauterine antibiotic infusion, the fact that the risks of endometritis after foal-heat breeding are higher means that the threshold for initiating relatively aggressive therapy should be lower than for maiden mares or foaling mares bred at a later estrus. In this respect, there are anecdotal reports that inadequate treatment of post-breeding endometritis at the foal-heat can compromise fertility during subsequent cycles.

2. Conclusions

Many horse breeders have strong opinions on whether or not mares should be bred at the foal-heat. A history of poor fertility in previous years, advanced mare age, complications at or around parturition, or even simply high costs or poor quality of frozen semen are all sensible reasons to delay insemination to the second postpartum estrus (preferably PGF2α-induced to minimize “days lost”). In addition, evidence of poor uterine involution (flaccid uterus, intrauterine fluid accumulation) or reproductive tract damage at a routine day 6 to day 8 postfoaling check would be reasons to instigate treatment to aid uterine evacuation and delay breeding to a subsequent estrus.

References


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