

Equine

# Understand How to Get Mares to Cycle Earlier in the Season

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The horse's gestation length is approximately eleven months long. To ensure the survival of the species, the horse's natural breeding season has evolved to span the time from May through August. Foals that are born during this time frame will receive ample nutrition from their dam, since grazing conditions are at their peak. These foals will also have a chance to grow and become more physically capable of surviving harsh winter conditions with potentially scarce food resources.

## Mares Ovulatory Season

Typically, most mares don't cycle year round. They only cycle during the breeding season also known as the ovulatory season. After the breeding season, their reproductive tracts slowly shut down. This eight to twelve week period is known as the fall transition. Winter anestrus is the time when most mares' reproductive tracts are completely shut down. Starting sometime in February, these mares' reproductive tracts slowly begin to resume functioning. This process can take between two and three months. Often the mare will develop between two and four different sets of follicles before ovulating for the first time in a given year. This is called the spring transitional period.



Penn State Mare and Foal

## Breeding Months

The horse industries use of January first as the universal birth date for foals, and the competitiveness of the horse show industry, have resulted in owners desiring foals to be born between January first and the middle of April. This necessitates breeding mares between February fifteenth and the end of May. Unfortunately, for the mare owner, this is

when the mare's reproductive tract is transitioning from being nonfunctional during winter anestrus and the ovulatory season. Mare owners experience untold frustration and expense trying to breed a mare during the erratic estrous cycles of the spring transitional period.

## Research

Extensive research has been done evaluating ways to manipulate this transitional period, in order to maximize reproductive success and minimize frustration and expense. The ideal scenario would be represented by an inexpensive medication that could be given for a short time, and the mare would go from winter anestrus to the ovulatory season during this short course of treatments. This goal has not been achieved and may very well never be achieved. However, it has been found that manipulation of the mare's nutritional care, and the hours of daylight that she is exposed to, do affect her reproductive functions. Manipulation of temperature has minimal influence.

Nutritional management has been found to influence the timing of a mare's first ovulation of the season in the following ways:

1. Mares gaining weight had a shorter time to the first ovulation of the season than mares losing weight. The greater the weight loss, the longer the ovulatory season was delayed.
2. Mares in moderate (Body Condition Score 5-6.5) or higher body condition had a shorter time to the first ovulation than thin (BCS < 4.5) mares.
3. High energy intake hastened the onset of the first ovulation at the end of the transitional period in thin (BCS < 4.5) mares, but not in the moderate (BCS 5-6.5) or fat (BCS >7) mares.
4. High quality protein intake also helped to shorten the time to the first ovulation.

Additional research performed at Texas A & M University looked at the effect of nutrition on reproductive efficiency. This research resulted in the following conclusions:

1. Mares foaling in thin (BCS < 4.5) condition had impaired reproductive performance, even when fed to meet energy requirements of lactation.
2. Increasing the energy fed to thin (BCS < 4.5) mares during lactation improved rebreeding efficiency, but the large amount of feed required for weight gain may increase the risk of colic and founder and is very expensive.
3. Mares foaling in fat (BCS >7) condition utilized stored body energy for efficient reproduction and lactation, even when losing weight. These mares also exhibited no foaling problems and had high re-breeding efficiency.
4. Mares entering the breeding season in moderate (BCS 5-6.5) condition or higher had a higher reproductive efficiency.

5. Mares in higher than moderate (BCS 5-6.5) condition did not show lower reproductive efficiency, but the extra condition was of no advantage unless they were losing weight during the breeding season.
6. Mares of moderate (BCS 5-6.5) or higher condition prior to breeding also had higher pregnancy rates, a lower number of cycles per conception, and achieved more pregnancies than mares in thin (BCS < 4.5) condition.

### **Major factor in controlling the mare's reproductive function**

Although nutrition has an appreciable effect on reproduction in the mare, research has elucidated that hours of daylight (i.e., length of day) is the major factor controlling the mare's reproductive function. Temperature exerts minimal effect on the mare's reproductive functions. The reason for this is that length of day increases very consistently during the spring, whereas; temperature does increase during the spring, but in a much less consistent manner. As the days get longer this stimulates the mare's brain to produce hormones that stimulate the ovaries to begin functioning again. As these hormones increase in the mare's circulation, her reproductive tract begins to function. Follicles will develop and the mare will show signs of being in heat, but if these hormones have not achieved a minimum concentration, instead of ovulating, the follicle will regress. This series of events may be repeated two to four times before the hormones achieve the threshold levels in the mare's circulation necessary for ovulation. Once ovulation occurs, the mare will continue to ovulate approximately every twenty one days until the fall transition begins, if there are no problems.

### **Do artificial lighting sources help?**

Researchers have looked at whether a daily regimen of putting a mare under lights that simulates the length of a summer day, would prevent her from ever entering the fall transition and winter anestrus. This failed leading researchers to conclude, that although initially long days are stimulatory to the mare's reproductive system, at some point during the ovulatory season, this stimulatory affect is lost. Regardless of the length of day, the mare's reproductive tract will begin shutting down for the winter. After several months of short fall and winter days, her reproductive tract's sensitivity to increasing daylight will be re-established, and the whole cycle will repeat it itself.

### **"Instant On" method**

A number of different lighting regimens have been developed over the years; the one that has consistently proven most successful for many years is referred to as the "Instant On" method. Requirements of this technique are as follows:

- The mare needs to be exposed to 14-16 hours of daylight every day, until she is either confirmed pregnant or a similar number of hours of natural daylight results from the passing of the seasons.
- This needs to be started after she has been exposed to a sufficient number of "short" days, to reset her biological response to the longer days.
- If a mare is maintained under natural lighting until approximately December first, or eight to ten weeks before her desired breeding date, this goal should be achieved.
- A good memory aid might be to start on Thanksgiving because you will be thankful for your mare starting to cycle early in the breeding season.

Once the lighting regimen is started, it is critical that the mare be brought inside before dark and that the extra hours of "daylight" are added after sunset rather than before sunrise. It is also imperative for success that the correct numbers of hours are achieved, and that the barn lights are not just left on all night. Leaving the lights on all night can be counterproductive. A minimum level of lighting also has to be achieved to ensure success. A good rule of thumb is that you should be able to read a newspaper in the darkest corner of the stall. Usually, a light bulb between 100 and 200 watts will achieve this minimum level. The type of light is not critical, meaning that the light can come from fluorescent or incandescent lights. The lights should be in the stall; if they are not, then all shadows need to be eliminated so that the mare does not stand in a shadow, thus negating the lights.

If a mare is stabled for some or all of the day, these lighting requirements need to be met during her entire time inside. If she is outside, enough stimulation occurs even on overcast days. Keeping a mare under lights does not shorten her transitional period, it just encourages it to start earlier in the year so that the ovulatory season also will start earlier, thus meeting the goal of breeding the mare to foal during the desired time of year. Most mares, when kept under these conditions, will begin cycling when intended, but not all mares will.

## **Sulpiride**

If this procedure is too labor intense, or if the decision to breed the mare is made when there is no longer sufficient time for the traditional use of lights, another regimen is often useful. A mare can be treated with a drug known as sulpiride. The mare would still need to be exposed to two weeks of the "instant on" lighting regimen, and then treatment with the sulpiride would begin, while maintaining the increased amount of light. If a mare is going to respond to this treatment, she will have responded within twenty-one days. Treatment of mares with sulpiride resulted in normal cycle length, normal pregnancy and foaling rates, and normal return to estrus for non-pregnant mares. This method, though more costly and

requiring twice daily injections, can be very successful. If this method is of interest to you, discuss it with your veterinarian.

## Contact Information

Ed Jedrzejewski DVM/Manager Penn State University Horse Unit  
Manager/eajed10@gmail.com

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