Artificial Lighting Use in Mares

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Breeding management of the mare can involve techniques that begin as soon as early winter to prepare for a successful breeding season the next spring. One such technique is the use of artificial lighting. This technique can successfully coax the mare’s body into thinking that the breeding season is here earlier in the season (Sharp and Ginther, 1975). Mares are seasonally polyestrous and during the winter months they enter a reproductive quiescence called anestrus, where they are not normally reproductively active (Sharp et al., 1993). Since the nature of the performance and racehorse industry favors a foal born as early in the year as possible, manipulating the mare to begin the estrous period, or cycling, earlier in the year can be advantageous.

Control of the mare’s reproductive circadian rhythm comes from the photoperiod. The retina of the eye perceives the daylight and that information is conveyed to the brain via a complex nervous pathway to govern reproduction. The natural events that regulate the mare’s physiological response to photoperiod actually have more to do with the length of dark hours than the length of light hours. Melatonin, a hormone that suppresses reproductive activity, is produced during the dark hours (Sharp et al., 1993). During the winter, the dark hours increase and therefore the mare’s reproductive activity decreases. Managing the amount of dark hours the mare perceives gives breeding managers the opportunity to dictate when she will be reproductively active and can be bred.

The process of shifting the mare’s physiology from anestrus to estrus with artificial lighting takes an average 40 to 60 days of daily light manipulation. To begin, mares need to perceive 16 hours of total light per 24-hour period. Since day length typically falls short of 16 hours in the winter, artificial lights have to be used to make up the difference (Kooistra and Ginther, 1975; Palmer and Driancourt, 1981). Research has shown that adding the artificial light at the end of daylight in the evening, rather than before in the early morning, is more effective in inducing an early onset of the estrous cycle (Sharp, 1980). The recommended light intensity mares should be exposed to is at least 100 lux in a 12x12ft stall (Burkhardt, 1947; Nagy et al., 2000). There can be no dark corners in the mare’s enclosure that might allow her to hide her head from the light. A well-known rule of thumb is to light the enclosure enough to where the fine print of a newspaper can be easily read in the darkest corner.

The addition of artificial lighting can easily be achieved by retrofitting a stall with an appropriate light on a timer, but utilizing the same technique in a turnout pen or on pasture is not as feasible. Luckily, development of new technology is paving the way for more economical choices in implementing artificial lighting. Equilume masks entered the market in 2014 and are a unique and effective method for delivering light to the mare to hasten the onset of the estrous cycle. The mask is fitted to the mare’s head, which allows for housing in any environment, including out on pasture. Research has shown Equilume is as equally effective as stalling under lights (Murphy et al., 2014).

Techniques such as artificial lighting can easily be implemented in a breeding program. Putting mares under lights is a simple and effective management strategy to bring mares into estrus earlier in the season. New technologies, such as the Equilume mask could make adding artificial light easy and effective especially for horses not being stalled.

Artificial Lighting Tips:

• Adjust artificial lighting frequently for the continual change in sunset and length of daylight to total 16 hours
• Implement a program of artificial lighting no later than December 1st to achieve February ovulations
• Check out Equilume to explore options for artificial lighting in different housing environments
https://equilume.com

References