



Head-worn light masks are an area of particular interest to researchers and the subject of several studies

Let There Be Light ARTIFICIAL LIGHTING AND ITS USE WITH BROODMARES

By AMANDA DUCKWORTH

PUTTING BROODMARES UNDER

lights is far from a new concept. However, understanding the science behind it can help those in charge of mares to do so more effectively. Additionally, the impact of artificial lights is also being studied for other uses with equines.

As the American Association of Equine Practitioners explains, mares are seasonally polyestrous, which means they have multiple cycles but are able to get pregnant only during certain months. Those months usually occur in spring and summer, when days are longer.

That is where lights come into play. Mares begin heat cycles in mid-to-late spring, but they are responding to the lengthening daylight hours as opposed to the warmer temperatures.

If the hope is to breed a mare early in the season in the Northern Hemisphere, she needs to be stabled under lights starting in December and will need to be exposed to the light for around 60-70 days.

In its paper "Putting a mare under lights," Colorado State University's Equine Reproduction Laboratory explains: "During these 60 to 70 days, the

light intensity needs to be a minimum of 10-foot candles (approximately 100 lux). A 100-200 W incandescent bulb or a fluorescent light in a 12-foot by 12-foot stall should be sufficient. The goal should be to provide 16 hours of light and allow for 8 hours of darkness. It is not advantageous, and actually may be less effective, to leave the lights on 24 hours per day. Mares respond better when allowed a period of darkness."

Putting mares under lights is generally accepted as a safe practice, but it is necessary to understand how doing so can impact the timing of delivery and the foal itself. Also, it is important to remember there is no need to put a mare who foals later in the spring under lights, as the lengthening daylight will do its job.

In January 2024, Veterinary Sciences published a study on the topic titled "The Effect of Supplemental Lighting during the Late Gestation Period on Post-Partum Mechanical Properties of Mare and Foal Guard Hair."

"The equine species are seasonal breeders and will start their breeding season between March and May," explained researchers. "Setting 1 January as the universal birth date has created a high demand for foals born early in the year (January–February) to produce mature yearlings and more developed 2-year-old racehorses."

It is these timings that have made using artificial lights such a popular choice, especially when it comes to Thoroughbred broodmares.

"These artificial light programs mimic the natural processes of increased hours of daylight that lead to early ovulation and, thus, the beginning of the reproductive active period," explained researchers. "Beginning the administration of artificial light in early December will allow the breeders to meet the industry-imposed breeding timelines and economic goals. Considering the relation between light, melatonin, and hair development,

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studies aimed to investigate what impact, if any, this unnatural photoperiod during the final months of gestation could have on maternal and filial guard hair properties at the time of parturition."

For the study, 60 mares and their 60 foals were selected, and guard hair samples were collected from the shoulder just after the parturition or birth. Researchers found that the foals of the light-treated mares developed significantly shorter hair than those of the control mares.

"As a consequence of the additional illumination, a shortening in hair length was observed, in agreement with previous observations," researchers concluded. "This effect was statistically significant among the newborns. The



As part of one study, the hair length of foals whose mares wore LED light headgear was analyzed

findings of this study strengthen the results of the previous work of Nolan et al., where the hairs of foals born of mares treated with low-intensity, short-wavelength blue light to a single eye proved to be shorter and lighter than the

hairs of foals born of control mares.

"The present study suggests that by administering low-intensity, short-wavelength blue light following the winter solstice, during the last 41 days of the pregnancy to the pre-partum mare, the hair properties of the foal were significantly influenced. The length and the diameter of the hair decreased, and its maximum force and tensile strength reduced."

The study referenced above was "Artificially extended photoperiod administered to pre-partum mares via blue light to a single eye: Observations on gestation length, foal birth weight and foal hair coat at birth," which was published in 2017 by Theriogenology.

"In seasonally breeding animals,

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Research concludes that light directed at one eye from a mask while in the pasture, "... enhances the efficiency of farm management by reducing labor and providing improved animal welfare by permitting the outdoor maintenance of mares in groups so that natural behaviors can be expressed."

photoperiod perception is crucial for timing of important physiological events," researchers of that study explained. "In the horse, long day photoperiod influences the onset of ovulation and cyclicity, shedding of the heavier winter coat and the timing of parturition. In this compilation of studies, conducted across three breeding seasons and two countries, the impact of artificially extended day length was investigated on gestation length, foal birth weight and foal hair coat at birth."

In the past decade, a common trick of the trade has been to put blue LED light masks on mares to guarantee they are exposed to the light. If a mare hides her head from a stall light, she will not receive the benefits, but a lighted mask removes that potential issue. However, studies have shown timings can be very important.

In January 2022, *Domestic Animal Endocrinology* published "Effects of blue monochromatic light directed at one eye of pregnant horse mares on gestation, parturition and foal maturity."

"Blue light directed at one eye advances the equine ovulatory season but may also advance foaling," explained

ALTHOUGH THE LIGHT MASK IS PRIMARILY USED ON MARES FOR BREEDING PURPOSES, NEW RESEARCH HAS ALSO SHOWN THAT IT COULD HELP WITH OTHER AREAS OF EQUINE HEALTH.

researchers. "In this study, effects of blue LED light on pregnancy outcome were assessed."

In all, 20 pregnant mares took part in the two-year study. During the first year, researchers made sure mares received an extended photoperiod using 50 lux of blue LED light directed at a single eye from 08:00 until 23:00 daily via head-worn light masks. This began in mid-December. In the second year, the mares were left to natural conditions to serve as a control.

"Gestation was shorter in blue LED light-treated than in control pregnancies," researchers concluded. "Foals

born to blue LED light-treated mares had lower wither heights, similar weights, and took less time to stand after birth than control foals. Foals born to blue LED light-treated mares had reduced hair length compared to controls and hair regrowth in treated mares was reduced. In conclusion, blue LED light directed at one eye advanced foaling and influenced height and hair coat but not weight in foals."

The same researchers followed the resulting foals and published the results. The study "Development of Foals Until One Year of Age When the Dam was Exposed to Blue Monochromatic Light Directed at One Eye During Late Pregnancy" was published in the *Journal of Equine Veterinary Science* in May 2022.

"In horses, blue LED light directed at one eye of pregnant mares shortens gestation length and results in the birth of foals with lower wither heights, similar weight and reduced hair length compared to controls," researchers explained. "In this study, we have therefore analyzed postnatal development of foals born to either blue LED light-treated or control mares."

For the study researchers tracked size, weight and hair coat changes for one year and heart rate, heart rate variability (HRV) and selected hematology parameters for one month.

"(Hematocrit) decreased and leukocyte and lymphocyte counts increased, but none of the parameters differed between groups," researchers concluded. "Heart rate and HRV increased until day 6 but did not differ between groups, indicating that foals born to blue LED light-treated mares were mature and healthy."

"The guard hair was shorter in foals born to treated mares compared to control foals at birth, but no differences in hair coat length were observed beyond the age of 2 months. At birth and 6 days thereafter, wither height and elbow to carpus distance of control foals were increased relative to foals born to blue



When the days get shorter and darkness falls earlier, artificial light is a popular choice for breeders with Thoroughbred broodmares

LED light-treated mares. Height differences decreased over time, and for elbow-to-carpus distance there was a time x group interaction. In conclusion, blue LED light treatment of pregnant mares is without detrimental effects on postnatal foal growth and development.”

It is important to keep in mind these additional factors, especially the possibility of earlier foaling. When it comes to Thoroughbreds, having a mare deliver before Jan. 1 is problematic even when the foal is perfectly healthy.

Of course, North America is not the

only place where this technology is used and studied. For example, in January 2022, the Journal of Animal Science and Technology published “Efficiency of Equilume light mask on the resumption of early estrous cyclicity and ovulation in Thoroughbred mares.”

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—JANUARY 2024, VETERINARY SCIENCES

This study took place on Jeju Island in Korea, and a total of 20 nonpregnant mares were randomly divided into groups. Nine wore the light mask, and 11 received stable lighting. The experiment was performed across seven different farms from November 2020 to February 2021.

“Our results showed that the reproductively active period of a non-pregnant mare can be advanced using blue light exposure to one eye from head-worn masks while mares are maintained at pasture and that this method is as effective as maintaining mares indoors under stable lighting,” researchers concluded. “This result is consistent with a previous study that showed a resumption of early ovulation of Thoroughbred mares.

“Their use also enhances the efficiency of farm management by reducing labor and providing improved animal welfare by permitting the outdoor maintenance of mares in groups so that natural behaviors can be expressed.”

Although the light mask is primarily used on mares for breeding purposes, new research has also shown that it could help with other areas of equine health. In October 2025, *Animals* (Basel) published “Influence of Extended Photoperiod Using Blue Light

Masks on Hypertrichosis, Coat Condition and General Health Parameters in Horses with Pituitary Pars Intermedia Dysfunction.”

For the study, 52 horses diagnosed with pituitary pars intermedia dysfunction (PPID), and displaying hypertrichosis, were sourced using an online survey of PPID horse owners.

From mid-December, 29 of the horses wore a light mask (Group T), extending photoperiod to 15 hours daily, while a group of 23 horses (Group C) remained under natural photoperiod as a control group. Researchers also recruited 17 unmedicated PPID horses to serve as an additional control (Group C2) because 85%

of recruited study horses received pergolide medication. They then analyzed the data on hair coat samples, shedding, and body condition scores that got collected monthly by owners for 13 months.

“Time, group, and time-by-group interaction affected hair length,” researchers said. “Group differences were attributable to shorter hair lengths in C2, and no differences in hair length occurred between T and C1. Time affected shedding scores, which was advanced by one month in T. In group T, BMQ responses showed improved coat condition in April, decreased fat coverage in April and June, and increased energy/alertness in February. Improvements in coat condition, clinical signs of PPID, and general quality of life were reported in T only in a final study questionnaire. Blue light treatment merits further investigation as a complementary treatment for PPID.”

Managing a mare’s fertility is a multifaceted job, and using artificial lights is one tool of the trade that can help lead to a positive result. Those who do so just need to be aware of the timings and the fact that coat health can be temporarily affected. Exploring how artificial light impacts broodmares has also led to research on how such lights might improve other issues that horses face. BH



Blue light exposure to one eye from head-worn masks is shown to be as effective as indoor stable lighting