



Light Mask Brochure

“At last, a novel and exciting advance in horse breeding which is based on sound theory and solid science. The Equilume Light Mask is sure to be of major practical benefit to those Thoroughbred breeders around the world who have the good sense to use it.”

W.R. (Twink) Allen, CBE, ScD, FRCVS, Director at the
Paul Mellon Laboratory of Reproduction,
Newmarket, UK

“The very best device that I have seen in 25 years of reproduction practice, second only to the introduction of the ultrasound. It will get them bred early.”

William T Gray, DVM, Cottonwood Veterinary Clinic,
California, USA

“I love our Equilume Light Masks! My horses always have a beautiful sleek shiny coat and they are much happier. I save so much time and effort on cleaning boxes each day also. It's a win win for me.”

Julieann McCool, Queensland, Australia

About Us

Equilume, headquartered at the heart of the Irish Equine Industry in Co. Kildare, Ireland, is the world leader in the research and development of light therapy solutions that assist the global horse industry maximize reproductive efficiency, health and performance.

Our goal is to accommodate the commercial needs of the global equine industry, while allowing horses to experience the health and welfare benefits of living outdoors. By providing flexibility and permitting exposure to optimum lighting when horses are at pasture or while traveling, the Equilume Light Mask helps to significantly reduce the management costs for equine businesses worldwide.

The Equilume Light Mask was developed following years of research by Dr Barbara Anne Murphy (Founder and CSO) and her team at University College Dublin. It consists of a comfortable headpiece for horses that provides timed, low level blue light to one eye. The smart technology in the Equilume Light Mask was specifically designed to influence a mare's reproductive system and stimulate the hormones necessary to produce a show-winning coat.

The Equilume team is comprised of enthusiastic equine and animal scientists. We are dedicated and passionate about using scientific knowledge and industry experience to help breeding and competition yards achieve success using our award winning lighting technology.



Equilume Light Masks nurture natural behavior, minimize management costs and deliver results.

Science

In nature, the timing of a horse's peak reproductive activity and optimum coat condition coincide with the light-filled days of late spring and summer.

Artificial light has long been used to mimic summer daylengths and advance the breeding season or the timing of a short sleek coat for horses. Indoor stabling under artificially lengthened daytime lighting is known to suppress the hormone melatonin. Melatonin is responsible for conveying information about the time of year to the horse's body. Keeping mare's 'under lights' stimulates the reproductive system to activate earlier in the year, in time for the official start of the breeding season or for early embryo collection. Similarly, light therapy means that competition horses can develop and maintain a sleek summer coat outside of the summer months.

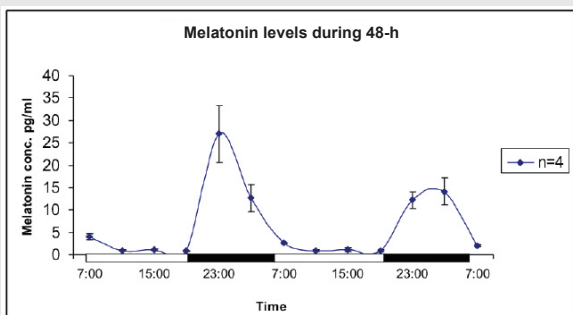
Stabling horses for long periods of time to provide the right lighting can be expensive and also limits a horse's ability to behave normally. In 2011, Dr Murphy and her team at UCD investigated the threshold level of blue light required to suppress melatonin in the horse. They found that a very low intensity light is required and it is sufficient to deliver this light to only one eye.

This research led to the development of the Equilume Light Mask. Scientific testing in multiple field trials across three continents has shown that the Light Mask is equally as effective as stabling horses under lights to achieve:

- Early breeding success
- Timely gestation
- Healthy foal weights
- Sleek, shiny show coats

... But with the added benefits to fertility, health and behavior that 24/7 turnout brings.

The hormone melatonin conveys the time of year message throughout the horse's body, regulating reproduction and coat growth. This graph shows the rhythm of melatonin production in the circulation of four mares during springtime.



The Equilume Light Mask delivers a soft blue light to one eye.

Breeding

Non-Pregnant Mares

The Equilume Light Mask is a cost effective, mobile alternative to indoor lighting systems for breeding stock.

The official birth date for most equine breeds is:	January 1st	Northern Hemisphere
	August 1st	Southern Hemisphere

Official birth dates are outside the horse's natural breeding season, so breeders must advance mare's reproductive activity each year to meet industry imposed time-lines.

Maintaining breeding stock 'under lights' by leaving lights on in stables until 11 pm nightly is an accepted method of advancing the breeding season in mares and stallions. The Equilume Light Mask is as effective as indoor stable lighting but allows horses to live outdoors 24/7 in their natural environment. The benefits of outdoor living are:

- Reduced stress and behavioral issues
- Optimized reproductive health
- Increased cost effectiveness for management
- Reduced labor for staff

Light Masks should be fitted on mares no later than Dec 1st (Northern Hemisphere) or July 1st (Southern Hemisphere) to ensure mares are cycling in time for the start of the breeding season.

Pregnant Mares

Requiring mares to foal earlier in the year than Nature intended has physiological consequences. The longer days of spring and summer stimulate the production of hormones that regulate fetal growth in utero. Mares foaling early in the season do not benefit from sufficient light stimulation necessary to provide these hormones. The consequences are:

- Prolonged gestation lengths
- Reduced foal birth weights
- Post-foaling fertility problems
- Reduced breeding efficiency

Studies using Light Masks have shown that these consequences can be avoided by providing the pregnant mare with a fixed period of extended day-length prior to foaling. Breeders who have introduced the use of Light Masks into their pregnant mare management also report the following additional benefits:

- Improved milk production
- Higher IgG levels in colostrum
- Elimination of post-foaling fertility problems
- Reduction in uterine fluid retention

For best results, Light Masks should be fitted on pregnant mares by Dec 1st (Northern Hemisphere) or July 1st (Southern Hemisphere).



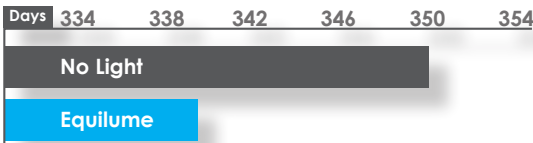
Research

Field Trial: Light Masks Reduce Gestation Length

15 pregnant mares with a history of long gestation lengths were divided into 2 groups. One group was fitted with prototype Equilume Light Masks on Dec 1st while the control group did not receive added light.

Results: The group of pregnant mares wearing Equilume Light Masks had an average gestation length reduction of 11 days.

This study was published in Theriogenology (Nolan et al, 2017).



Field Trial: Light Masks Increase Foal Birth Weight

A group of 30 mixed-breed pregnant mares due to foal in February or March were selected and evenly divided. 15 mares were fitted with Equilume Light Masks on Dec 1st while the control group did not receive added light. All 30 were kept on the same programme regarding pasture time, and nutrition.

Results: The average birth weight of foals born to the group of mares wearing the Equilume Light Mask was significantly greater by 8.4 lb.

This study was published in Theriogenology (Nolan et al, 2017).

group	no. of mares	mean BW (lbs)	SEM
light mask	16	103.5	1.6
no light	13	95.1	3.8
difference		p=0.039	

The provision of extended day light to pregnant mares via Light Masks ensures gestation lengths and foal birth weights fall within the normal range observed during the horse's natural breeding season.

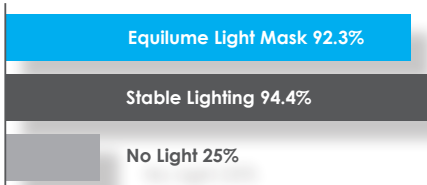
Field Trial: Light Masks Stimulate Early Reproductive Activity

62 maiden and barren mares were used in three study groups with similar ratios of maiden/barren mares. On Dec 1st, 26 mares were fitted with prototype Equilume Light Masks, that delivered blue light to one eye from 4 - 11pm daily, and were maintained outdoors at pasture. 16 mares were maintained indoors under fluorescent lighting until 11pm daily and 20 were outdoors at pasture without added light (control).

Results: > 90% of the group maintained at pasture with light masks and the group maintained indoors under stable lights were reproductively active on Feb 1st, while only 20% of the unlit control group were cycling.

It was concluded that the use of Light Masks was as effective as standard stable lighting at advancing the breeding season in mares.

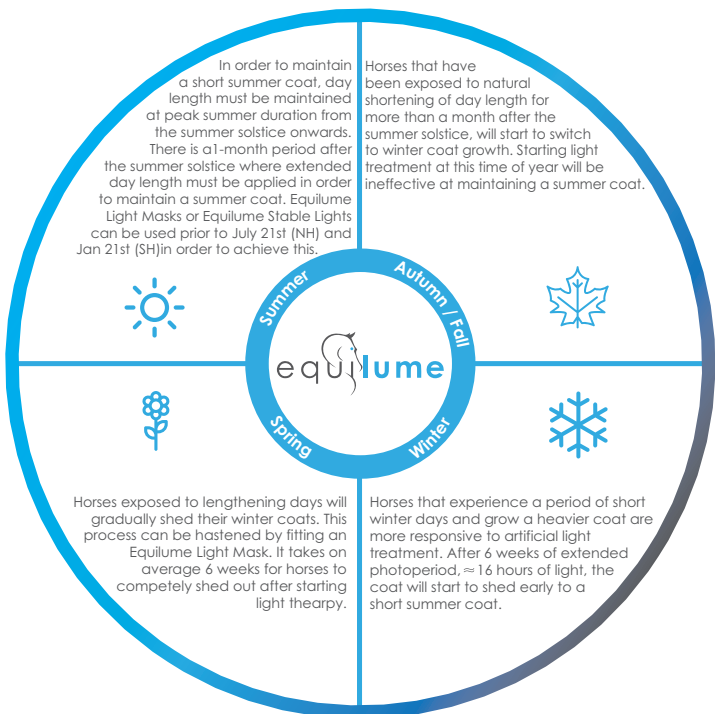
This study was published in Equine Veterinary Journal (Murphy et al, 2013).



% of reproductively active mares as determined by veterinary examination and hormone analysis on 10th February 2012

Coat Condition

The timing of light therapy is very important for coat manipulation. The following diagram explains how light therapy influences coat growth at different times of the year.



Remember:

- The processes of hair growth and shedding take time and do not occur immediately in response to the light stimulus.
- Interrupting the hair growth cycle, by clipping or exposure to stress, can influence the rate at which these processes occur.
- Temperature is a key factor in accelerating and maximizing results; so correct blanketing is advised.
- Horses maintained under continuous long day lengths will likely become unresponsive to artificial light treatment at some point in the year and this will affect their coats. It is advised that horses are allowed to experience 6-8 weeks of short winter photoperiod at some point within the year. This allows the horse to reset its annual clock and respond optimally to extended artificial day length provided by the Equilume Light Mask.



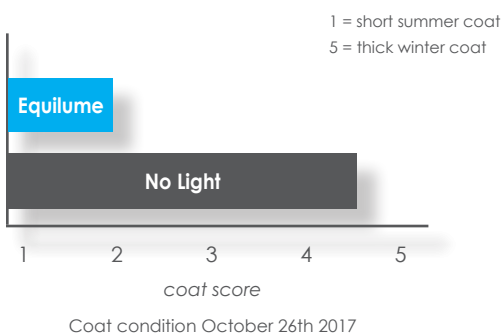
Research

Research shows that horses wearing Light Masks maintain their summer coats in autumn and accelerate shedding of winter coats in spring.

Field Trial: Light Masks Help Maintain Summer Coat

12 stabled horses and ponies were divided into 2 groups. Group 1 was fitted with the Equilume Cashel Mask on July 21st, providing 15 hours of light daily. Group 2 remained exposed to natural day length changes. Both groups were rugged at night as temperatures got cold. Every 2 weeks coats were visually assessed and hair samples measured and weighed.

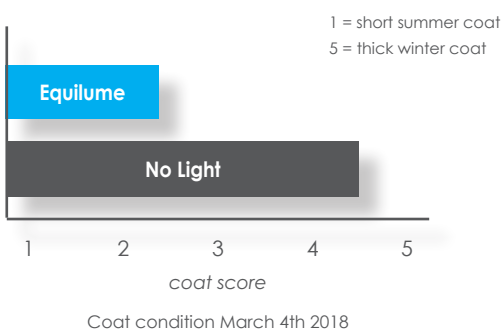
Result: Group 1 wearing Equilume Cashel Masks had shorter, lighter hairs and sleek summer coats until the end of the study in late October. By this time, Group 2 had transitioned to long, heavy and dull winter coats.



Field Trial: Light Masks Accelerate Winter Shedding

10 horses were divided into 2 groups and maintained outdoors. Group 1 were fitted with Equilume Belfield Masks on Nov 28th, delivering light from 4pm until 11pm daily, Group 2 remained exposed to natural day length changes. Both groups were rugged for the duration of the trial. Every two weeks coats were visually assessed and hair samples measured and weighed.

Results: Coat shedding was significantly accelerated in Group 1 resulting in shorter, lighter hairs and a more summer-like coat by early March. Group 2 still had long, heavy winter coats at this time.



Blue Light Indoors

The Facts

- Natural daylight provides regularly timed dawn and dusk, predictable seasons and comprises high levels of short wavelength, blue light.
- Blue light is biologically effective, it regulates and stabilizes a horse's circadian rhythms through receptors in the eye.
- Lengthened daylight during spring increases production of seasonal hormones in horses, improves muscle metabolism, feed utilization and lean muscle mass.
- The high blue component of sunlight also improves well being and mood through increasing prolactin and serotonin.

The Problem

- Stabled horses receive insufficient and often erratic exposure to light, especially biologically active blue light contained in natural daylight.

The Solution

The Equilume Light Mask:

- Provides low intensity biologically active blue light that extends daylight to bring forward a horse's summer vigor.
- Delivers a regularly timed day-length that stabilizes the horse's internal rhythms.
- Extends daylight using blue light and provides our stabled horses with all the benefits of natural sunlight.

The benefits of blue light therapy include improvements in:



Muscle Tone



Mood



Weight Gain



Performance

Models

Equilume Light Mask:

Model: Belfield

Lifespan: 5 months
Battery Type: Seasonal
Active Hours Per Day: 7
Program: 4pm - 11pm

Model: Curragh

Lifespan: 4 months
Battery Type: Replaceable
Active Hours Per Day: 7
Program: 4pm - 11pm

Model: Cashel

Lifespan: 18 months per cup
Battery Type: Rechargeable
Charging Interval: 7 days
Active Hours Per Day: 15
Program: 8am - 11pm



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