

# If Only They Could Talk

**Our regular focus on equine health. This month vet NEIL MECHIE gives us an update on the experiment being carried out at MJR into the effects of increasing daylight hours on horses in some specially adapted boxes.**

**J**UST under a year ago we introduced a new lighting system in some of the boxes at the Kingsley House yard as part of an innovative experiment.

Each stable was renovated with new ceilings, was freshly painted and was fitted with two full-spectrum, daylight-imitating light tubes. The new lights were on timers capable of setting different on and off times for every day of the year.

The aim of the experiment was to test a theory that extending daylight hours in the spring and autumn of the flat racing season might optimise the horse's performance, health and appearance.

The scientific principles underpinning the manipulation of daylight provision in animals is relatively simple. The pineal gland in the brain is responsible for the production of melatonin from serotonin, a process that relies on two enzymes to carry out the conversion of those hormones.

## Production

Enzymes are catalysts that bring about biological reactions within living organisms. Melatonin is only created and secreted during hours of darkness as one of the essential enzymes in its production is only active during darkness; for the rest of the time serotonin is secreted.

Light intensity is measured in Lux. At light levels less than 100 lux the switch from serotonin to melatonin secretion occurs, with maximum melatonin secretion at less than 50 lux, which is hormonally perceived darkness. Peak serotonin secretion occurs at above 300 lux.

As well as the intensity of light, full-spectrum sunlight is very important in the hormonal recognition of light. Photoperiod is the length of day versus night, and it is the most important cue that allows animals to determine which

season it is. It therefore has effects on the reproductive system, coat quality, growth and many other things.

By placing two lights in each box we achieved readings consistently above the critical 300-plus lux of light to all aspects of the stable, mimicking full daylight within the horse's box. The light levels are easily measured using a hand-held lux meter.

Interestingly, in a non-renovated box with a normal bulb on a cloudy day in the winter, the light levels with the light on in the box were only between 28 and 50 lux, which as explained above, is hormonally perceived as darkness by the horses.

We extended the daylight period around the summer solstice, June 21, by 124 days, that is by 62 days each before and after that date. This had the effect of reducing winter days with less than 12 hours of light from 174 days to 95 days. This also reduced the depth of winter darkness that the horses experienced, from the shortest day having 7hrs 20mins of light to it having 10hrs of light.

**T**HE horses have been in the experimental boxes for nearly a full season now. The effects of the lights on the horses' coats has been undeniable. A horse's coat naturally grows longer as the hours of daylight reduces, preparing to protect the horse in the cold, long dark days of winter.

By the end of the flat season on November 8, only two of the horses taking part in the experiment at Kingsley House needed their coats to be clipped because they had grown. Almost every other horse at MJR outside of the experiment needed clipping.

However, the effect of the lights on the horses' performances appears to be less obvious. The old adage "looks well,

runs well" is one of Mark's favourite sayings, so in theory the lights should have had a positive effect as the horses look very well indeed. But proving a distinct improvement in performance is difficult. It is hard to gauge and quantify, and is open to a large number of variables.

## Experiment

When I wrote earlier this year about the start of this experiment, I suggested the increased light provision might decrease bacterial and fungal counts within the stables. We took a small number of swabs from the walls of the experiment stables approximately five months after the new lights were fitted and compared them with swabs taken in the non-lit boxes. There appeared to be no difference in fungal counts on the swabs.

But, interestingly, there was a considerable increase in bacterial counts in the lit boxes, from readings of a few hundred thousand bacteria in the unlit boxes to 8-12 million in the lit boxes. This was a highly significant increase and prompted us to question whether it was a positive or negative finding.

This query required us to look further into what the bacteria were in the lit boxes and whether they were harmless environmental bacteria that are present almost everywhere, or if they were pathogenic (harmful) to the horses. There has been no evidence of clinical bacterial or viral infection in this group of horses so it seems most likely that the bacterial growth is harmless and, while there was no difference in fungal counts from lit and unlit boxes, we appear to have eliminated ringworm infection from the experimental group. However, we intend to look further into the increased bacteria, and this has involved contacting Glasgow Veterinary College, who are in the process of selecting students to put a study together on establishing details of those bacteria.

Vitamin D, which is synthesised by the skin when exposed to sunlight, is required for the process of calcification of the bones, and a lack of vitamin D causes softening of the bones. In race-

*The new lights at Kingsley House*



horses adequate ossification of the bones is an important factor in the remodelling of their bones in response to training and high-speed exercise. Studying vitamin D levels in the horses in the lit boxes has also been discussed with Glasgow Veterinary College as a useful research

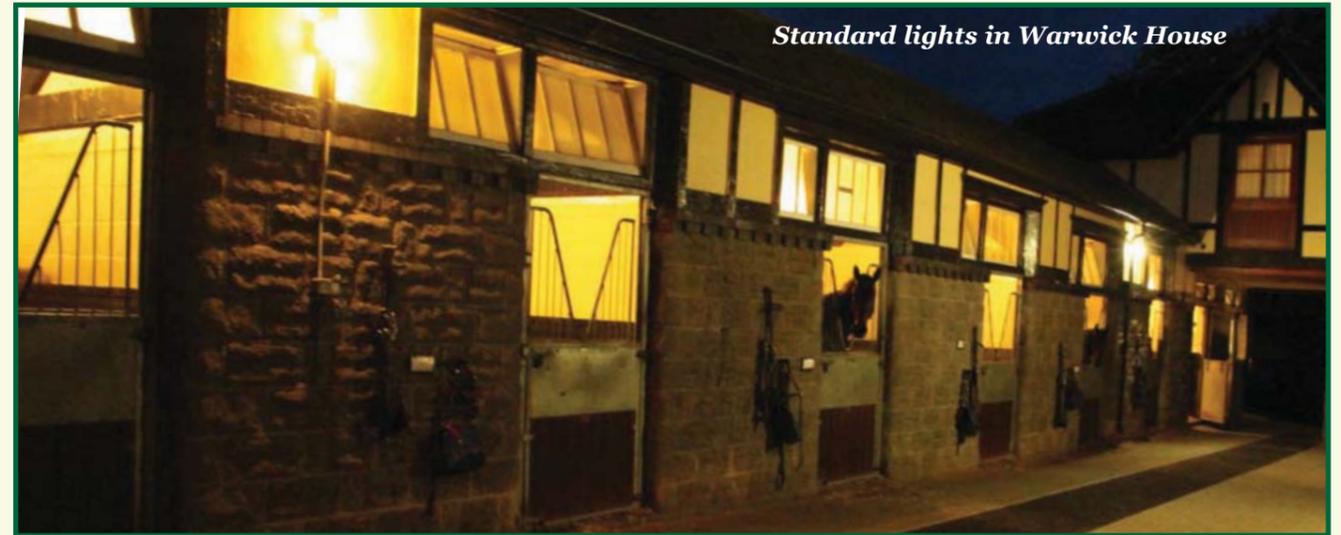
project we could carry out in conjunction with them.

After nearly a year with the new lights in place at Kingsley House we have found no obvious improvement in performance, but as stated earlier this would be very hard to quantify and prove.

However, the horses look extremely well and the staff find working in the brighter lights advantageous.

We will be following up those lines of investigation referred to above, and we will continue to look into the effects of extended daylight on the horses. ■

*Standard lights in Warwick House*



*Neil Mechie*

At Mark Johnston Racing, the peace of mind of our owners is a priority. This is why we have included the vet fees in our inclusive daily rate for horses in training.

Neil Mechie did his veterinary degree at the University of London. He then worked for 14 months as an intern at the Minster Equine Hospital, York, where his duties included surgical and colic work. After a spell at the specialist equine practice of vet Simon Stirk, near Ripon, Neil worked for six months at Clevedale Veterinary Practice at Guisborough. Neil's keen interest in racing is heightened by the fact that he has a point-to-pointer, and when not kept busy with work by Mark, Neil spends time looking after his border collie.

## The MJR veterinary team



*John Martin*

John Martin is from the town of Stradbally in County Laois in Ireland's Midlands. He was raised on a farm and from a young age had ambitions to be a vet.

He trained at University College in Dublin and it was there that he first took an interest in horse racing, which nurtured an ambition to eventually specialise in working with horses as a vet. After graduating he took up a post at a veterinary hospital in Navan, County Meath, before moving to England to join a practice in Louth, Lincolnshire.

He joined MJR at the start of 2010, staying for more than two years before returning to Ireland for a brief spell and then resuming his position at the yard in April 2013.

