

# The influence of lighting on layer breeder performances

The importance of good lighting is being increasingly recognised, which is well-deserved. An optimal light climate has a major influence on layer breeder behaviour, welfare and performance.

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Compared to humans, poultry have relatively large eyes. Due to the location of the eyes on both sides of the head, they have narrow binocular vision and wide monocular vision.

Binocular vision enables poultry to perceive a single three-dimensional image of their surroundings. Monocular vision means that poultry can use their two eyes separately.

Since poultry are prey animals, their main focus is on monocular vision. This is a useful skill that allows them to forage and be alert for predators at the same time.

## Photoreception

Poultry have a specific way of perceiving light through both the eyes and the skull.

The light that is perceived through the eyes affects behavioural responses and regulates the biorhythm. Light with an intensity of above four lux is also perceived

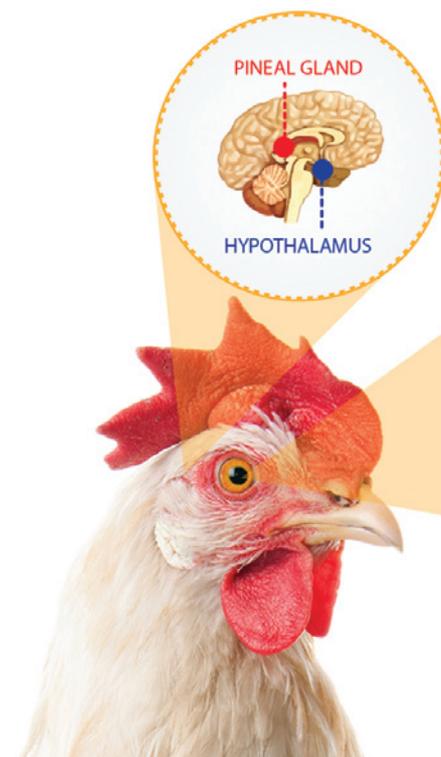


Fig. 1. The way poultry receives light.

stimulates the release of LH and FSH. These sexual hormones play a role in both sexual maturation and stimulation.

Light perception is a species-specific biological process. This means that poultry have a different spectral sensitivity

compared to humans.

They have a broader spectral

sensitivity and an additional cone, which enables them to perceive UV-A light as well as red, blue and green light.

Due to their differing spectral sensitivity, poultry also perceive light intensities differently. For humans, light intensity is measured in lux; for poultry, it is measured in gallilux. To find out what a chicken really sees, it is important to measure light intensity in gallilux.

## Photostimulation

The number one goal for layer breeders is to produce a maximum number of eggs with high hatchability. Light has a major influence on this.

As stated before, the light that enters the skull is responsible for sexual stimulation, and thus influences egg-laying and hatchability. It is important to use lights with

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through the skull. Light perceived through the skull influences both the biological clock and sexual development:

- It gives a signal to the pineal gland to regulate melatonin. Melatonin plays a role in the sleep-and wake rhythm of a chicken.
- It also goes to the hypothalamus and from there to the pituitary gland, which

Fig. 2. Warmwhite LED vs. human & poultry spectrum.

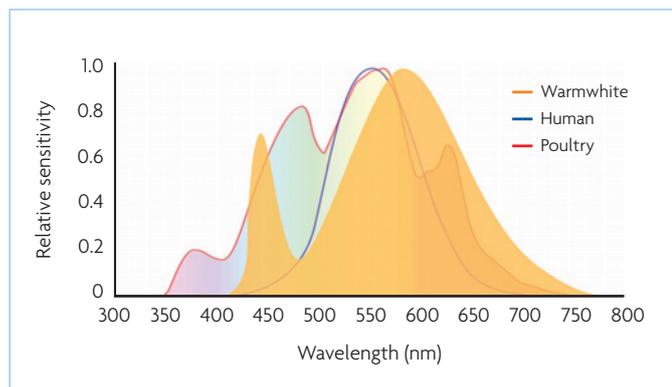
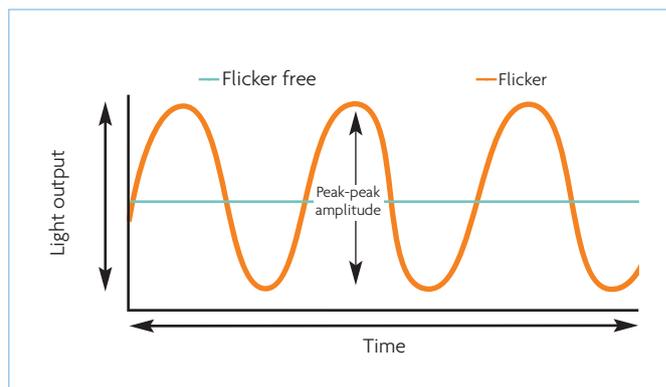


Fig. 3. Flicker vs. flicker-free lighting.



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a broad light spectrum in which all colours are present, since each colour has its own characteristics that influence the chickens in a particular way.

Long wavelengths are responsible for sexual stimulation, since they penetrate the skull more easily than short wavelengths. Long wavelengths represent the red part of the light spectrum, which is why it is important to use warm white lights in the layer breeder house.

## Distribution

A uniform light distribution that is adjusted to the needs of the house and the poultry in it significantly influences animal welfare and performance.

With floor housing, for example, the nests should be darker. This will encourage breeders to go to the nests to lay their eggs rather than laying them on the floor.

Brighter light is important in the activity areas where they forage and have their feeding and drinking spots; it stimulates activity and prevents floor eggs.

This explains the importance of devising a tailor-made lighting plan prior to purchasing the lamps. Creating a lighting plan will give a clear view of the lux levels in each area of the house, which enables you to see whether the lamps suit the house.

## Dimmability

It is important that lights can be dimmed evenly from 100-0%.

Research shows that turning lights on and off abruptly has negative effects on animal welfare and production results. One of the effects is to increase stress levels amongst the hens. It is therefore important to naturally simulate sunset and sunrise to make the chickens more at ease, increase welfare and thus improve production results.

Another important reason for being able to dim lights evenly from 100-0% is that it enables you to influence breeder behaviour. Feather pecking, increased FCR or other unwanted behaviour may arise when the layer breeders are very active. This can be prevented by dimming the lights when unwanted behaviour occurs.

When dimming, make sure that the light intensity decreases evenly without flickering.

## Flicker

The use of 100% flicker-free lights is highly recommended.

Flicker, or photometric flicker, is the rapid change in the light output of a lamp.

Poultry are more sensitive to light than humans, which is why they also perceive flicker faster than we do.

Flicker has a very stressful effect on layer breeders, which can be explained by going back to the layer breeder's roots.

In nature they were prey animals, which meant that they had to be continuously on their guard. Flickering lights give layer breeders the impression that a bird of prey is hovering overhead. This perceived threat leads to higher heart rates and increased stress levels.

## Conclusion

Lighting is a very important aspect of layer breeder housing equipment. It influences behaviour in general, sexual stimulation, the biological clock and stress levels.

We always recommend carrying out detailed research to find out what lighting solutions suit you best, using a proper light scheme and making sure a lighting plan is set up before purchasing.

Make sure that the lighting meets all the criteria mentioned above. This will allow you to boost animal welfare and performance. ■

Request your custom-made lighting plan at [www.hato.lighting/en/lightplan](http://www.hato.lighting/en/lightplan) or send an email to [sales@hato.lighting](mailto:sales@hato.lighting)