Light transfer at transfer

By Ron Meijerhof

Birds know when it is time to reproduce because of the increase in light during spring. However, they do not recognize this increase with their eyes, but with a little gland which is located in the brain area. This gland is triggered into producing specific hormones if the day length increases. It recognizes this increase because the skull at the location of this gland is not completely light tight, but allows light radiation to pass.

But not all light passes the skull evenly easy. White light is a combination of all different colors of light, and each color has a specific wave length. The wavelengths combined in white light range from 300 to 800 nm (1 nm is a millionth part of a millimeter). Violet light has the shortest wave lengths, then comes blue with about 400 nm wave length, then green and so on until red light which has the longest wave length, about 800 nm. But with wave lengths it is as with sound, the bass noise can penetrate much better through a wall, the door of a car or over a long distance. Bass sounds have a long wavelength, and long wavelength can penetrate better than short wave lengths. This holds also for light waves: red light (long wavelength) penetrates better through the skull than blue light (short wavelength).

This means that in any light source, the bird will only react on the amount of red lights for stimulation. The higher amount of red light in the total spectrum of the lamp, the more the bird will react to it with development.

This is important for us, because in breeders we do want to have stimulation of the reproductive system after 20 weeks, but not earlier. If we give high amounts of red light in the total spectrum of the lamps that we use in rearing, we do stimulate the birds more easily then when we use a spectrum that contains more blue light. If we want to reduce that stimulation, we have to reduce the total light intensity more if we use a lot of red light in the spectrum, than when we use more blue in the spectrum.

However, if we transfer the birds to the production farm and we want to stimulate the reproductive system, we do need more red in the total spectrum, as these wave lengths will pass the skull and stimulate the gland in the brain. When the lamps do not have a lot of red in their spectrum, we have to increase the total light intensity more to overcome that.

The consequences of this is that we preferably transfer birds from a more blue, bright, cooler type of light (little stimulation of the reproductive gland) in rearing to a more red, warm type of light in production. Even without an increase in total light intensity, the bird will receive a stimulation due to the change in color. If we do the opposite, rear in red warm light and transfer to production with blue, cool light, we have to increase the light intensity much more to get the same stimulation of the reproductive gland.

Lamp producers use specific codes to describe the color of the light that their lamps give. Usually that is a three digit code, for instance 825 or 835. The last two digits describe the color of the light, and the higher that number, the more cool, blue the light will be. Often, these lamps with a higher color coding are described as “cool day light”, where the lower color coding is often described as for instance “warm day light”.

When we install lamps in rearing and production, it is good to realize that ideally the color coding in rearing is higher than in production, so from “cool day light” in rearing towards “warm day light” in production. If we do it the other way around, we have to increase the light intensity in production much more to overcome this relative reduction of amount of red wave length in the light spectrum, to be able to stimulate the birds at the same level.