

## Research Summary

June 18, 2020

# The effects of light wavelength on broilers: more than meets the eye

## Purpose of the study

Light has mainly 3 components: photoperiod, which is the number of hours of light and dark, and the pattern that they are distributed; intensity, which is the brightness of the light, and wavelength, which is the spectral distribution of light, i.e., light color. Several studies have been conducted on the impact of light wavelength on production, welfare and behaviour of broilers. Birds raised under low wavelengths, such as blue, are usually calmer than birds raised under long wavelengths, such as red. The common thought is that the reason for this to happen is because birds are not able to see well under low wavelengths, which would result in changes in behaviour. To test this hypothesis, tested eye health and vision of broilers reared under three wavelengths. This study is part of a larger study that aims to understand the impacts of raising broilers under different light color on their behaviour, welfare, health and production

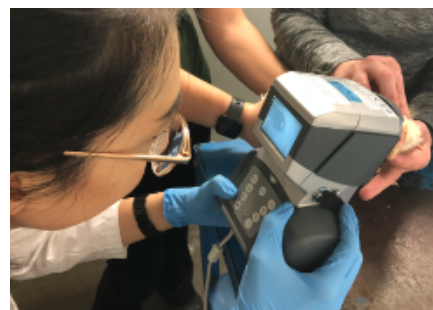
## What we did

Ross 708 male broilers were raised under either blue light (435-500 nm), green light (500-565 nm) or white light (380-780). Light was provided using LED light bulbs. Lighting program started at 23L:1D for day 1, decreasing 1 hour daily until reaching 16L:8D by day 5, with dawn and

dusk transitions daily of 15 min. Light intensity was measured in clux, which takes in account the specific characteristics of how birds perceived light, was 14.3+0.1 clux during week 1 and 9.6 +-0.5 clux for the remaining weeks.



A series of eye health assessments and vision tests were performed (complete ophthalmic examination, eye dimensions and weights, assessment of refraction index and spatial vision test), in order to identify if raising birds under different wavelengths would lead to deformations diseases on the visual system, or if light colours would affect birds ability to discriminate details in their visual scene.



## What we found

No abnormalities were found on the complete ophthalmic examination and on eye sizes and weight, where alterations would lead to vision impairment or potential vision loss. The refraction index test resulted in birds raised under blue light being considered slightly more farsighted and birds raised under white light slightly more nearsighted. Besides that, the spatial vision test revealed that birds raised under blue light approached a stimulus faster at smaller distances, and at longer distances were more successful in their approach the correct stimulus as compared to birds raised under white light.



## Conclusions

Our results indicate that the exposure to blue light results in minor differences in vision. However, it is not clear if these differences alone are sufficient to fully explain the substantial changes in bird behavior that have been observed.

## Who we are



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