

# Colour constancy in chickens

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The birds easily learned under white light to choose a food container of a specific orange colour and to avoid food containers with a yellow or red colour. Credit: Peter Olsson

Chickens can find the correct colour in redder lighting conditions, researchers from Lund University and the University of Bristol have found. Their study indicates that – like us – chickens have colour constancy (a feature of the colour perception system which ensures that the perceived colour of objects remains relatively constant under varying illumination conditions).

Anyone who has taken a walk in a green beech [forest](#) during the spring will remember seeing the beautiful green light in such a forest. This is caused by the ability of fresh green leaves to absorb most of the light but specifically transmit the green light to the forest floor. Despite this apparent [green light](#), the banana in your backpack would still appear yellow to your eyes, much as it would in normal daylight. This fantastic ability to perceive colours the same in differently coloured illuminations is known as colour constancy.

Without colour constancy, all forest living animals would have problems reliably recognising others of their species or palatable food items in different forest environments and in sunlit patches.

Peter Olsson and Professor Almut Kelber of Lund University, in collaboration with Dr David Wilby from the Ecology of Vision Group in Bristol's School of Biological Sciences, investigated colour constancy in [chickens](#).

The birds easily learned under white light to choose a food container of a specific orange colour and to avoid food containers with a yellow or red colour. Could they recognise the same orange colour in changed illuminations? To what extent could they tolerate and still correctly identify the orange colour in increasingly redder lighting conditions?

The researchers found that the chickens could easily find the correct colour in redder illuminations, meaning that they do have colour constancy, just like humans. The birds could recognise the correct orange colour in more strongly changed illuminations if the difference between the orange and the yellow and red colour was also more pronounced. However, their colour constancy was not perfect.

Human colour constancy is not perfect either. This is why we sometimes perceive the colour of, for instance, an item of clothing in one way under

the artificial lighting of a store and as another colour in daylight. Recently, this was demonstrated in the worldwide phenomenon of 'The Dress': was it white and gold, or blue and black? Whether or not you remained colour constant dictated which combination of colours you saw.

In an analysis of their experiments, the scientists compared the amount of illumination change in which the chickens remained colour constant to the changes between forest light and daylight, which the chickens' Red Junglefowl ancestors would have experienced in their natural environment. The chickens in the experiment remained colour constant in larger illumination changes than they would experience in their natural environment. Chickens, and very likely other birds as well, can thereby rely on their [colour vision](#) in the different environments they move between to find and identify food and mates.

**More information:** Peter Olsson et al. Quantitative studies of animal colour constancy: using the chicken as model, *Proceedings of the Royal Society B: Biological Sciences* (2016). [DOI: 10.1098/rspb.2016.0411](https://doi.org/10.1098/rspb.2016.0411)

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