

Broilers and layers respond differently to coloured light

Israeli research illustrates that layers and broilers show a different response to coloured light. Layers seem to dislike green light, however, broilers tend to grow better under this colour.

By Aaron Priel, Rehovot, Israel



◀ **Coloured light has an effect on bird performance, but not always in the same way.**

control room and by operating the two parallel lighting systems simultaneously in the other two rooms.

“Upon photo stimulation at 30 weeks of age, the day length was increased to 16 hours of light in the white light control room, while in the other rooms either by increasing the red light only, leaving the green light exposure for 6 hours, while increasing the green light in the 3rd room for 16 hours and leaving the red light on for 6 hours,” Rozenboim commented. The final result of the turkey experiment showed us that the activation of extra photo receptors, while providing non-photo stimulatory condition to the retina, “significantly increased egg production from 84 eggs per hen at 27 weeks to 95 eggs for the same period, while retinal stimulation combined with non-photo stimulation condition to the brain photo receptors depressed the egg production process below normal, to 28 eggs for the same period of time,” said Rozenboim.

The role of photo stimulation in both the growth rate and reproduction of birds is a focus of the research carried out by Professor Israel Rozenboim of the Department of Animal Science at the Hebrew University of Jerusalem’s Faculty of Agriculture in Rehovot. Photo stimulation, he says, refers to the effect of light and light quality - such as light spectra, duration of exposure of a certain kind of light and its intensity in poultry houses where turkeys, laying hens, broilers and broiler breeders are being grown. “The problem is introducing the right type of the light to the birds in order to achieve efficiency regarding growth rate and re-productivity,” Rozenboim explains.

Reproductive performance

Many years ago it was proven that light has a direct effect on the productivity process of birds. In many broiler houses throughout the world, green lights are used to enhance growth. The basis of the new research conducted by Rozenboim is based on recognising the fact that there are two major photo reception sites in birds: retinal (particularly sensitive to green and yellow bands) and extra-retinal photo receptors (located in the brain, mainly in the hypothalamus). “The basis of our new research project was the evidence that neutralising the retinal tissue increases the reproductive performance, expressed by increased egg production in birds,” says Rozenboim.

Red light or green light?

The initial research was carried out in cooperation with Professor Muhamed el Halawani of the Animal Science Department at the University of Minnesota. The research was supported by a grant from Willmar Poultry Company. The research pertained to turkey hens aimed at investigating the role of retinal and extra-retinal photo receptors on the reproductive activity of turkey hens housed in three environmental light-controlled rooms. The first room, according to the Israeli scientist, was equipped with white light, while the second and third rooms were equipped with two parallel lighting systems - red and green. Before the photo stimulation, the birds were maintained for 6 hours of light - short day provided by white light in the



Professor Israel Rozenboim: “Neutralising the retinal tissue increases the reproductive performance, which is then expressed by increased egg production in birds.”

Increased egg production

The research project has been resumed in Israel with the participation of Nader Mobarkey, a Ph.D student at the department. The experiment was extended to broiler breeders hens characterised by a major change compared with previous experiments: the broiler breeder hens were grown in cages and each cage was equipped with individual lighting infrastructure. The results of this experiment show that the impact of the red light combined with depressing the retina by emitting green light - similar to the procedure we used in the experiment with the turkeys - resulted in a 10-egg rise in production per bird compared to the controlled test (after a 12-month period of egg laying) whereas the green light decreased the egg laying level to 30 eggs compared with the results attained from the controlled test.

“We decided to study the depressive impact and influence of the retina on the reproductive process. If we understand the mechanism that activates the ‘depressive process’, this understanding might provide us with an opportunity to develop pharmacological or environmental treatment procedures that would somehow abolish the ‘depressive process’,” Rozenboim concluded. ■