

Productivity of Laying Alabio Duck and its Eggs Quality under Exposure of Different Intensity and Color of LED Light

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ABSTRACT

The purpose of this study was to analyze the different combinations of intensity and color of LED monochrome lamps for optimal productivity, as well as the internal and external quality of Alabio duck eggs. The study was carried out for 4 weeks period of raising which was divided in 2 stages. In the first stage, it was used a completely randomized factorial design of 4 light colors x 3 light intensities with 4 replications with 5 ducks of each replicate, totaling 240 laying Alabio ducks. The light color was 4 colors consisted of yellow, red, blue, and green, alongside with intensity levels of 10 lux, 15 lux, and 20 lux. The irradiation method of layer ducks was 18 hours light and 10 hours dark (18L: 10D of ahemeral method). The variables observed were laying age, egg production and the total weight of eggs, mortality, feed consumption, FCR, and income over feed cost (IOFC). In the second stage, it was selected 3 best combination treatments from the first phase. The experimental method was based on a completely randomized design, encompassing the best treatments as P1, P2, and P3, with 5 replications with 10 duck per replicate, totaling 150 laying Alabio ducks. The variables were egg internal quality, which consisted of haugh unit egg, yolk index (EYI), egg albumin index, and yolk color. The external egg quality observed were egg weight, shell thickness, shape index, and specific gravity. The results of the first phase showed the best productivity was achieved in blue color with an intensity of 15 lux on all measured variables. The results in the second stage showed the best treatment is blue light color treatment with a light intensity of 15 lux, on the internal qualities of duck eggs include HU (95.11±2.39), EYI (0.421±0.63), EAI (0.121±0.12), egg yolk color (8.36±0.31), and also the best in terms of external quality, with the highest egg weight (66.76±5.21 g). It was concluded that the combination of blue light color with an intensity of 15 lux significantly increased the egg production and performance of Alabio duck from Kalimantan.

Keywords: color and intensity; ahemeral; monochromatic light; duck productivity; egg quality