

PRODUCTIVE PERFORMANCES OF COMMERCIAL BROILER CHICKEN UNDER INTERMITTENT LIGHT AND COLOURED LIGHT REGIME

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ABSTRACT

A total of 200 broiler chicks of Vencob-100 strain were procured and reared under standard management conditions till 42 days of experiment. After completion of one week they were divided into 8 groups according to different light regime mixing colour of light and intermittent light. The values for body weight (gm) at the end of 4th week of age under blue and green coloured light having light duration 20 L + 4D was differ significantly ($P < 0.05$). The values for body weight gain (gm) at the end of 5th week of age under blue coloured light (20L + 4D) and green coloured light (18L + 6D) was differ significantly ($P < 0.05$). At the end of 6th week of age the feed conversion ratio of broiler chicken under blue light (18L + 6D) and under white light (23L + 1D) were differed significantly ($P < 0.05$). From the results it can be concluded that overall performance of blue coloured light and intermittent light show better performance on weekly mean body weight (gm) and weekly mean body weight gain than other coloured light and continuous light regime. When economic performance was taken into consideration it was seen that blue, green coloured light and intermittent light increase the profit.

Key words: Broiler Chicken, Coloured light, Growth Performance

Broiler production needs comparatively lower investment and very small area of land than needed for any other livestock enterprises. This enterprise is very attractive of the flexibility of the operations in obtaining a live weight of about 1.5 kg at an age of 6-7 weeks. This will facilitate the poultry farmers to raise 5-6 crops of broiler in a year. Light is an important aspect of avian environment. Typically broilers are reared under 23L:1D during first week of life followed by variable duration of light lengths for the rest of the grow-out period. However several investigations showed that using continuous light programs induces sleep deprivation and causes severe physiological stress responses. Therefore most of the recent

researches have focused on restricting light regime to improve productivity of broiler chicken because the physical activity is very low during darkness and energy expenditure is considerably less. Colour is also a major aspect of light which exerts variable effects on broiler performance. Blue light has a calming effect on birds. However red has been used to reduce cannibalism and feather picking. It has also been shown that blue-green light stimulate growth in chicken while orange red stimulate reproduction. Keeping the above facts in view the present study was planned to find out the productive performances of commercial broiler chicken under different coloured light i.e. blue, green, red & white and to compare the productive

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performances of commercial broiler chicken under intermittent light and continuous light regime.

MATERIALS & METHODS

The research was conducted at the Department of Livestock Production Management, West Bengal University of Animal & Fisheries Sciences, Kolkata-37. A total of two hundred commercial day old broiler chicks (Vencob-100

strain) were purchased from commercial broiler hatchery for the study. A standard brooding was provided for the chicks. After completion of one week they were divided into 8 groups according to different light regime mixing colour light and intermittent light. All the groups housed in deep litter system with adequate ventilation throughout the period. All the birds were under uniform management condition and procedure.

Table 1: Lighting schedule during growing periods

Treatment code	Colour of light	Natural day light (hrs)	Artificial light (hrs)	Darkness (hrs)
Control - x	White	12	11	1
Control - y	Red	12	11	1
Test – A 1	Blue	12	8	4
Test – A 2	Green	12	8	4
Test – B 1	Blue	12	6	6
Test – B 2	Green	12	6	6
Test – C 1	Blue	12	4	8
Test – C 2	Green	12	4	8

The intermittent light schedule used for Test A (A1 & A2) was (20L & 4D) and light schedule was (18L + 2D + 2L + 2D).

The intermittent light schedule for Test B (B1 & B2) was (18L & 6D) and light schedule was (12L + 3D + 6L + 3D).

The intermittent light schedule used for Test Group – C (C1 & C2) was (16L + 8D) & light schedule was (12L + 4D + 4C + 4D).

In the present study, the data obtained from experiment were statistically analyzed and interpreted according to Statistical Package for Social Science¹⁸ and processed in software. Probability of $P < 0.05$ was described as significant.

RESULTS AND DISCUSSION

Body weight & Body weight gain, Feed conversion Ratio

At 4th week of age the average weekly body weight (gm) of broiler chicken under blue and

green coloured light having light duration (20L + 4D) was statistically significant ($P < 0.05$) (Table-2). Mean \pm SE for blue light (20L + 4D) and green light (20L + AD) were 750 ± 19.97 gm and 794.75 ± 13.64 gm respectively. Few workers^{6 & 15} reported that intermittent lighting programs have frequently resulted in superior broiler productivity in comparison to constant light. According to earlier worker¹⁶ the broilers exposed to 16L: 8D were heavier than those exposed to 23L: 1D until the age of 42 days. According to earlier finding¹¹, performance of broiler chickens is improved by intermittent lighting of repeated cycles of 1h light and 2h darkness schedules compared to continuous lighting.

At 5th week of age, the mean weekly body weight gain (gm) of broiler chicken under blue coloured light (20L + 4D) and green coloured light (18L + 6D) was statistically significant ($P < 0.05$). Mean \pm SE for red light (23L + 1D) and white light

(23L + 1D) were 416.56 \pm 36.4 gm and 385.93 \pm 25.4 gm respectively. Some researchers^{1, 3, 4 & 5} reported that the weight gained by the bird when kept on intermittent lighting program was significantly better than on continuous light. According to earlier worker¹⁶, broiler birds exposed to blue or green lights were heavier at 35 d of age as compared to red or white light. Another scientist¹⁰ recorded increased growth rate when the broiler birds were reared under blue light environment along with broiler under red light when compared to other coloured light environment.

At 6th week of age, the feed conversion ratio of broiler chicken under blue (18L+6D) and white light (23L+1D) was statistically significant ($P < 0.05$). Mean \pm SE for blue (18L+6D) and white light were 1.66 \pm 0.02 and 1.92 \pm 0.02 respectively. According to some researchers^{8, 12, 13 & 17}, no significant difference in feed conversion was observed when subjected to red light environment and other coloured light environments. Feed conversion

efficiency was most efficient under blue light environment than those raised under other light sources in broilers chickens. It is in agreement with the finding of other worker⁹. The feed conversion ratio of the chick grown under various intermittent light regimes was significantly better than those grown under continuous light. The present observations are in agreement with the earlier findings^{1, 2, 3, 7 & 14}.

CONCLUSION

Blue coloured light and intermittent light show better performance on mean body weight and mean weight gain than other coloured light and continuous light regime. Therefore it may be concluded that to increase profit, blue or green light is preferable to red or any other light. Intermittent light is preferable than continuous light. But considering the limitation of experimental facilities the experiment should be further practiced with large number of birds in different season of the year for better conclusions.

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