The Effect of Chicken – house Light Intensity level on Egg Production in Lohman and Hisex layer breed.

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Abstract

The chicken layer industry in Malaysia is the important poultry industries which are the 5th world range in export volume. Most of the chicken houses were close - system management and intensively control the other factor and environment that supported the high production. The objective of the study is to estimate the effect of light intensity on the capacity in two layer breed, Lohman and Hisex, by the egg production evaluation. The result showed total 7,927 eggs from the different light intensity cages were significantly difference. The level 2 light intensity (20 – 40 lux) has the highest qualified – egg at 48% (1,265/2,634). The information from the cooperative project will be benefit for the light – system development in the farm for good quality production

Keywords: light intensity, egg production

1. Introduction

The poultry industries especially the laying hens in Malaysia is the economically export value. Most of chicken house were closed system with multilayers tiers. The artificial condition both thermal, humidity, air ventilation, lightening and nutrition has been develop for supportive the highest productivity of layer hens. In poultry industries, the artificial lighting system plays the crucial role for environment factor controlling. The physiological reaction of light in poultry presented as the chicken maturation, behavior, health status and egg production [1]. The affection of light is influenced by the light period, intensity and color of the lamb, therefore, the artificial lighting is expanding used in poultry commercial industries for increasing the ability of reproductive of layer hens [2]. The light intensity (LI) influenced to the onset of sexual maturity and consequently reproductive performance [3].

However, there are not many researches have been apply the resultant of the light intensity on Lohman and Hisex breed which are the commercial breed of layer hen in recently poultry industries. Therefore, the objective of this project is to determine the light intensity affectation on egg production of Lohman and Hisex layer breed. The result of this study will be useful for the farm to motivate the suitable light system for each layer breed and ensuing the higher hens performance and egg production.

2. Methodology

2.1 Light intensity evaluation

The 2 studies chicken houses were selected by the chicken breed and egg – produce aging.(30 – 50 wks). The light intensity level were examined by the light meter (AI 13344 model) The light intensity were grouped as the different of light within 3 group; (1) over 40, (2) between 20 – 40 lux and (3) less than 20 lux.

The studies cages were marked among the 3 cluster of light intensity areas in the chicken house as present in figure 1

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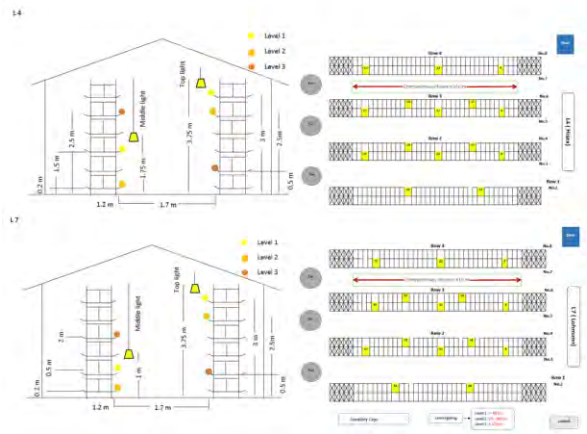

Figure 1 the light location and the sampling cage of the chicken house L4 (Hisex breed) and L7 (Lohman breed)

2.2 Egg production Examination

The eggs from the studies cages were sort out and weight 3 days/week for 4 weeks. Total 7,927 eggs were weight by digital egg – weight machine (H – 30000 model) and separate into two group; over standard quality (within/over egg weight level with chicken age) and under standard quality. In addition, the eggs were clustered by egg – grade standard among no. O – 5 egg size.

Table 1 Standard of egg weight within the chicken age (week)

Week	Lohmann age (week) /standard weight (g)	Hisex age (week) /standard weight (g)
1	41 wks / 63.3 g	40 wks / 64.2 g
2	42 wks / 63.4 g	41 wks / 64.4 g
3	43 wks / 63.4 g	42 wks / 64.6 g
4	44 wks / 63.5 g	43 wks / 64.7 g

2.3 Statistical Analysis

Chi – square and Number Cruncher Statistical System (NCSS) ver. 2000 (Kaysville, UT) program were used to assess differences in egg quality among the light intensity level.

3. Result

Total 7,927 egg samples were weight and classified as 3,584 (45.2%) standard – qualified egg and 4,343 (54.8%) of under standard – qualified eggs. The highest standard – qualified eggs were present in the light level 2 group and significantly difference from another group (X^2 = 15.078, df = 2, p < 0.01) as showed in table 2. By grading the weight of egg into 6 group (egg no 0 – 5), additionally, the biggest egg sized (egg no 0 "Jumbo") rate were highly found in light intensity level 2 as showed in table 3.

Table 2 The egg quantities among the light level group

Light level	Total	Standard	Under-standard
1	2,667 (33.6%)	1,140 (42.7%)	1,527 (57.3%)
2	2,634 (33.2%)	1,265 (48.0%)	1,369 (52.0%)
3	2,626 (33.1%)	1,179 (44.9%)	1,447 (55.1%)
Total	**7,927**	**3,584 (45.2%)**	**4,434 (54.8%)**

Table 3 The number of egg in egg – grading cluster

Light level	Total eggs	Egg grading					
		0	1	2	3	4	5
1	2,667	202	699	1,172	538	53	3
2	2,634	276	727	1,120	460	51	0
3	2,626	243	674	1,153	479	69	8
Total	7,927	721	2,100	3,445	1,477	173	11

4. Conclusion and Discussion

The light is one important factor in inducing the bird behavior, the maturity and egg production in laying hen[1]. The result in this study showed the suitable light intensity level for producing standard egg weight in Lohman and Hisex breed layers were between 20 – 40 lux significantly (p < 0.01). In addition, the result about egg – size grading showed the light intensity between 2- -40 lux also yield the highest sized egg rate (10.5%; 276/2,634). The result data also correlated with previous report which informed the effective influence of light intensity on egg production was 32 to 40 up to 343 to 409 lux during the 8 – months laying period. However, there was no significant factor in light intensity and the thickness of egg – shell [5].

However, neither the light intensity is affected to the quality of egg production in layers hen, but also the light color also is the important factor on hen behavior and productions [6]. This result related with the previous studies public about the red LED light at 30 lux increased the egg production [4]. Moreover, the light color also presented the affection to the meat chicken and demonstrated that the red color influenced the aggressive behavior, floor pecking and wing stretching more than green and blue light color while the white light color effected to the longer sleeping and walking time [7].Conversely, there are many researches has been public about the higher aggressive action and mortality rate of chicken.in blue light [1]. The blue light chicken showed the higher of offensive action, walking, and feather pecking [8]. The significantly highest of egg production have been discovered in both red color and white color illumination [9][10].

The information of this study will be the benefit for light system management in farm which might provide the suitable light intensity range for layer cage tiers level.

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