A comparative study on production efficiency of brown and white pullets

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Even though the laying hen industry in Kuwait is one of the most important animal industries, it covers only 55% of local egg consumption, and the remainder is imported resulting in increase in egg prices. In addition, a major problem that the egg industry is facing is the low quality of the eggshells, resulting in a large loss to the industry. Therefore, it is important to use a strain of laying hens that performs the best under local environmental conditions and produce high quality eggs so that the producers can reduce production cost and be able to increase profitability and compete with the imported products in both quality and price. Hens that produce brown eggs are more efficient and brown eggs have better egg quality, including shell quality. Therefore, the major objective of our study is to compare the production efficiency of strains that are used for production of both white and brown eggs under local Kuwaiti environmental conditions. Production efficiency of pullets is what will be reported in the present paper.

A total of 600 one-day old pullets from Lohmann LSL-Classic white and also 600 one-day old pullets from Lohmann brown-Classic were used in this experiment and their performance was compared. It was found that body weight of brown and white pullets were similar till 4 weeks of age and then body weights of brown pullets were higher than that of white pullets. At sexual maturity (22 weeks of age) body weight of brown hens was 1785gms and that of white pullets was 1551gms. Even though cumulative feed consumption till 22 weeks of age for the brown pullets (8418gms) was higher than that for the white pullets (8289gms) feed efficiency for brown pullets was better (4.82) than that for the white pullets (5.47). These results indicate that performance of brown pullets is better than that of white pullets.

Key words: brown and white pullets; body weight; feed consumption; feed efficiency.

Introduction

Poultry production is affected by such factors as breed and strain of chickens used, environmental conditions in the poultry house, management practices, and feed and feeding management (Bell and Weaver, 2002). Different breeds and strains vary in their genetic makeup. A strain is a group of birds, within a breed, that is selected for specific criteria, such as age at sexual maturity, livability, egg production, or egg quality or a combination of more than one. Recently, different strains of Leghorn that lay brown eggs in addition to strains that lay white eggs were developed. Strains such as Lohmann (LSL, white), Lohmann Brown, Hy-Line-W-36 and W-98 and Hy-Line Brown, have been developed from the Leghorn breed. The different strains vary in the different criteria of egg production and quality (Moreng and Avens 1985; American Poultry Association 1985; Crawford, 1990; North and Bell, 1990; American Poultry Association 2001; Bell and Weaver, 2002). In addition, the stress response to handling is greater in white leghorn than that in brown leghorn as reported by Fraisse and Cckrem (2006). The brown strains were developed because there was an apparent demand for consumption of brown eggs. In addition, there was apparent problem with shell quality in white eggs. This problem was more evident in the egg industry in Kuwait. Therefore, there was interest to use strains of laying hens that lay better quality eggs.

In comparing strains used for production of white and brown eggs, Scott and Silversides (2000) found that eggs from ISA-Brown hens were heavier than those from ISA-White hens and had more shell and albumen, but less yolk and albumen weight. In addition, Silversides
and Scott (2001) reported that eggs from ISA-Brown hens had greater percentage of shell than those from ISA-White hens. In addition, Grobas et al. (2001) compared production performance of ISA-Brown hens with Dekalb Delta, a White Leghorn egg layer. They found that egg weight and egg mass from ISA-Brown were more than that from Dekalb Delta, and feed efficiency was also better for the ISA-Brown hens.

In addition, Anderson (2002) provided detailed information on the differences in egg production and quality between different white and brown egg strains. Strains used were Hy-Line-W-36, Hy-line-W-98, Bovans (white), DeKalb (white) and DeKalb (sigma) for white eggs, and Hy-Line (Brown), Bovans (Brown) and DeKalb (Brown) for brown eggs. He found that the average age at sexual maturity for the brown hens was 132.7 days, which was shorter than that of white hens (137.8 days). He also found that the overall average of hen-day egg production for the brown hens was 85.6%, which was higher than that of white hens (83.2%). It is important to emphasize that any improvement in egg production of laying hens would be translated to economic benefits to the company. An increase of only 1% in egg production in Kuwait would reflect again of approximately KD 115,000. Anderson (2002) also found that egg weight was more for brown hens (61.1 g) than that of white hens (58.3 g). In addition, he found that feed efficiency was similar in both brown and white hens and percent mortality was higher in brown hens than in white hens. However, he reported that net income per hen (egg income – feed cost) was more for the brown hen than the white hen.

Therefore, it can be stated that differences in egg production and quality do exist between different strains of laying hens and that brown egg hens perform better than white egg hens.

The present study was conducted to compare the difference in pullets performance between brown and white egg laying hen strains) raised in Kuwait; and to investigate egg production and egg quality of brown and white hens. Currently, only data on pullet performance of white and brown chickens will be reported.

Materials and methods

The experiment started on September 13, 2005. Six hundred one-day old chicks from two strains of Leghorn laying hens were used. These strains were Lohmann LSL-Classic, which is white egg producers, and Lohmann Brown-Classic, which is a brown egg producer. The optimum space needs as reported by Weeks and Nicol (2006) was provided to both the brown and white pullets.

Feed rations were prepared at the poultry research farm in KISR. The feed rations included grower (CP = 18.6% and ME = 2870 Kcal/Kg), developer (CP = 14.9% and ME = 2750 cal/Kg), and pre-lay (CP = 18.0% and ME = 2755 Kcal/Kg). The grower diet was provided to pullets from day one to eight weeks, the developer from eight to sixteen weeks, and the pre-lay from seventeen to twenty four weeks.

Disease control is crucial and its prevention is through both strict biosecurity and the use of recommended vaccination programs. Vaccination includes vaccine for different diseases (Newcastle Disease, Infectious Bronchitis, Gumboro and Fowl Pox) at different ages.

Body weight and feed consumption were measured at 4 wk intervals. In addition, mortality was recorded daily and percent mortality was calculated weekly.

Results and discussion

Both brown and white pullets started to lay eggs at 19 weeks of age, and reached sexual maturity (50% egg production) at 21 weeks of age. Body weight of White and Brown pullets from day one to eight weeks, from eight to sixteen weeks, and from seventeen to twenty four weeks was measured at 4 wk intervals. In addition, mortality was recorded daily and percent mortality was calculated weekly.
Feed consumption for brown and white pullets is shown in Fig. 2. The results indicate that feed consumption for brown pullets was higher than that for white pullets. The total feed consumption for brown pullets was 8417 gm while that for white pullets was 8289 gm. However, feed efficiency for brown pullets was better (4.82) than that for the white pullets (5.47). These results indicate that production performance for brown pullets is better than that of white pullets.

The results show that the cumulative percent mortality till 22 weeks of age was similar for brown pullets (3.96) and white pullets (3.55).
It is important to indicate that both brown and white pullets reached sexual maturity at the same time (147 days of age). This is different from that reported by Anderson (2002). The difference could be due to different lighting programs used in the two studies.

**Conclusion**

The feed efficiency for brown pullets was better than that for the white pullets. Both strains reached sexual maturity at the same age (147 days of age).

**References**


