

## CORRELATION BETWEEN BODY WEIGHT & EGG WEIGHT OF DOKKI AND FAYOUMI HEN IN PAKISTAN

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### Abstract

Dokki & Fayoumi hens were studied for their egg production and feed consumption features. Feed consumption of 101.67 and 105.4 gram per day per Dokki & Fayoumi hens bird was observed in the under test poultry from 20th to 40th weeks of age. In Dokki breed, the total egg production was recorded as 47.2% and average number of egg per hen was 66.2%. In this type an average increased egg weight was found from 39.2g to 45.9g. An average body weight gain during the 20th to 40th week of age was observed as 0.67kg. The survival/viability was 93.74% under the test conditions. On the other hand in Fayoumi breed, total egg production was 54.7% and the average egg weight 41.6 grams. The average body weight of the hen at 20th week of age was 1.35 kg and at 40th week of age was 1.684 kg; with an average gain in the body weight during 20th to 40th week of age was 0.325 kg. The mortality in Fayoumi was 5.45% recorded and survival was 94.55% whereas in Dokey it was 6.36 & survival was 93.74. In the both under test breed positive correlation between body weight and egg weight was recorded.

**Keywords:** Correlation, body weight, egg weight, Dokki breed and Fayoumi breed hens.

### INTRODUCTION

The Dokki hen was introduced in Pakistan (Anonymous, 2003). It is a cross breeds from Fayoumi and barred Plymouth Rock and is basically crossed for high body weight gain and egg production. Aslam and Nishibori (2009) indicated that certain crossbreeds of hen shows improve characters in respect of growth and egg production. Dokki has yellow or white shanks and having barred plumage; autosomal and sex linked (Nordskog, 1970) on the entire body including hackle and tail. It has single comb and red ear lobes. The egg shell color is light brown. Dokki are fairly normal active chicken and good looking plumage pattern color on entire body. They are normal maturing, but not aggressive to people and still less common than Fayoumi. The majority of reports indicated a strong positive genetic correlation between body weight and egg weight (Kruger et al., 1952; Peeler et al., 1955 and Merritt 1968 Duncan and Mench, 2000; Santos et al ,2000; Webster, 2000). These reports suggest a provision of positive correlation between body weight and egg production in Dokki as well.

The Fayoumi is also a foreign introduced breed in Pakistan. Nordskog (1970) found two-plumage colors in Fayoumi i.e. dark and light. According to him the dark phase was autosomic barring or penciling, while the light phase was a Colombian type pattern. The color of shank was almost dark and the plumage was green or grey while the light plumage was yellow. Highly positive correlation between body weight and egg weight of Fayoumi also has been reported (Peeler *et al.*, 1955). Huang *et al.* (2009)

has worked on Impact on growth features, weight, and other characteristics in broiler chickens Gunawardana *et al.* (2009) reported on hen performance, egg solids, egg composition, and egg quality of different hen breeds.

The objective of this study was to evaluate the performance of Dokki breed at 20 and 40 weeks of age in comparison with Fayoumi breed for their economic benefits.

### MATERIALS AND METHODS

This experimental work was carried out at Poultry Production and Research Institute, Industrial area Korangi, Karachi. The birds hatched in spring were brooded in an electronic brooder. In order to having enough vigorousness to bear handling at the age of 24h, all the under test chickens were wing banded pedigree and properly vaccinated. At 20 weeks of age pullets were chosen by numbered wing bands and they were kept in separate cages.

During the experiment a commercially available diet was supplied to the all under test birds *ad libitum*. As usual the diet was composed of carbohydrates, protein, fat, minerals and vitamins etc. The observation on body weight and egg weight of each hen was made at 20 and 40 weeks of age. Egg production was recorded three times a day. Feed consumption was recorded once a week.

The experimental data was collected from 110 Dokki and 110/103 Fayoumi hens. It was thereafter, subjected to statistical analysis as suggested by Snedecor and Cochran (1967).

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## RESULTS

Some economically important traits of Dokki & Fayoumi hens were studied with reference to Pakistan. Results so far obtained are presented in Tables 1-5. It was found that During 20th to 40th weeks of age average feed consumption (in g/hen/day) remained about normal. In Dokki, the total egg production was found 47.2% and average number of egg per hen remained 66.2% and the average egg weight was observed to increase from 39.2 to 45.9 grams during observation period. The average gain in the body weight during the 20th to 40th week of age was obtained as 0.67kg. The correlation between body weight and egg weight in all cases were found positive. The correlation was + 0.325 and 0.082 at 20 to 40 weeks of age respectively. The mortality was recorded 6.36% and survival was recorded as 93.74% respectively.

In Fayoumi, total egg production was found to be 54.7% and the average egg weight was obtained as 41.6 grams. The average body weight of the bird at 20th week of age was recorded as 1.35 kg and at 40th week of age it was found to be 1.684 kilograms, with an average gain in the body weight of during 20th to 40th week of age was 0.325 kg/week. The correlation between body weight and egg weight in all cases were found positive. The mortality was found to be 5.45% and survival was recorded to remain 94.55% respectively.

Table 1. Feed Consumed by 110 Doki and 110 Fayoumi hens each during the observation period.

Breed	Total Feed consumption (Kg)	Average Feed consumption (gram)per day per bird	Feed consumption per Egg (gram)
Dokki	1,565.75	101.67±1.86	215.1± 9.75
Fayoumi	1,635.75	105.4±4.74	195.6±8.80

Table.2. Egg production from 110 Doki and 110 Fayoumi hens each during the observation period.

Breed	Total percentage of egg production	Av. No. of Eggs/hen ±SD
Dokki	47.2	66.2± 5.0863
Fayoumi	54.4	76.2± 2. 987

Table 3. Egg weight at different age periods of the under observation breeds of poultry.

Breed	Av. Egg weight at 20 weeks of age (gram)	Av. Egg weight at 40 weeks of age (gram) ±SD
Dokki	39.2	43.9± 1.72088
Fayoumi	38.9	41.6± 1.6372

Table 4. Body weight of the under test breeds

Breed	Av. Body weight at 20 weeks of age (kg) ± SD	Av. Body weight at 40 weeks of age (kg) ± SD	Av. Body weight gain from 20-40 weeks of age (kg) ± SD
Dokki	1.302± 0.051034	1.972± 0.0773024	0.670± 0.02626
Fayoumi	1.359± 0.0532728	1.684± 0.0660128	0.325± 0.01274

Table 5. Correlation between body weight and egg weight of the under test breeds.

Breed	Age (weeks)	df	Coefficient of correlation (r)
Dokki	20	44	+ 0.325** 10.56 %
	40	73	+ 0.082 N.S
Fayoumi	20	44	+ 0.333 ** 11.09 %
	40	73	+ 0.231 * 5.34 %

\* p < 0.05, \*\* p < 0.01.

## DISCUSSION

The feed consumption and weight has an obvious relationship (Duncan and Mench 2000; Webster 2000) the average weight in gram of feed consumption per day per hen was in taken from 20 to 40 weeks of age. Dozier *et al.*, 2010 used criterion of 18 and 42 weeks that is similar to that was used in the present study.

Table No.1 shows the result of total feed consumption of Dokki and Fayoumi. Feed consumption of Dokki was 1565.75 kg and the average feed consumption per day per bird was 101.6 gm, whereas total and average feed consumption of Fayoumi was 1635.75 kg and 105.4 gm respectively. On an average each egg of Dokki required 215.1 gram of feed as compared to 195.6 gram in case of Fayoumi. This indicates that difference in the average daily consumption of the two types of birds is not significant. It was also observed that male convert feed to meat more efficiently than female as showed by Lesson and Summer, 1997.

The total egg production in percentage and average egg production from 20 to 40 weeks for Dokki and Fayoumi is given in table no.2. The total egg production data was collected for 110 birds of Doki and Fayoumi each. In Dokki, the total egg production and average number of egg per hen was 47.2% and 66.2 respectively, whereas in Fayoumi, total egg production and average number of egg per hen was 54.4% and 76.2 respectively. This show that Fayoumi has higher percentage of total egg production and average number of egg per hen as compared to Dokki.. However, the difference in mean egg production was statistically non-significant.

Feed and egg weight and size has a close correlation Santos *et al.* (2010). The average egg weight at 20 and 40 weeks of age is given in Table 3. Average 50 eggs of 20 weeks and 50 eggs of 40 weeks broods of the each breed were obtained and analyzed. The average egg weight at 20 week was 39.2 gram and average egg weight at 40 week was 43.9 gm of Dokki. Shoffuer and Sloan (1948) summarized estimates of egg weight in Dokki which ranged between 46 to 48g. Kinney (1949) also summarized the average egg weight 52g for light breeds and 49g for heavy breed in Dokki. Though these authors have reported a relatively higher weight of eggs obtained from the Dokki breed than the present findings; that could be their better conditions of housing and the environment etc., whereas, in Fayoumi breed, these were found as 38.9 gm and 41.6 gm, respectively. It shows that average egg weight in Dokki was higher than that of Fayoumi. However, the difference in mean egg weight was statistically non-significant (5% level) at 20 weeks old, but significant (5% level) at 40 weeks old.

**Body weight:** The body weight of each bird taken from 110 Doki and 110 Fayoumi at 20 and 40 weeks; which listed in Table 4. The average body weight at 20 and 40 week and Average gain in weight from 20 to 40 weeks for Dokki and Fayoumi are given in Table 4. The average body weight at 20 week was 1.302 kg, and the average body weight at 40 weeks was 1.972 kg. The average gain in weight from 20 to 40 weeks was 0.490 kg. whereas in Fayoumi, average body weight at 20 and 40 weeks were 1.359 kg, and 1.684 respectively, with an average gain in body weight of 0.325 kg. It was also observed that average body weight of Dokki, increases regularly from 1.302 to 1.972 kg, during 20 to 40 weeks and average weight gain was 0.670 kg. Krueger *et al.* 1952 and Abd-el-Gawad 1961 have also published few reports on the estimates of body weight at sexual maturity in Dokki, which ranged from 0.19 to 0.43kg, whereas Peeler *et al.* 1955 gave higher estimates of body weight in Dokki which ranged from 0.71 to 0.85kg. However, when it compared with Fayoumi, it was observed that average body weight of Fayoumi was heavier than Dokki at 20 weeks of age and decreased at the 40 weeks of age. This shows that average body weight in Fayoumi after age 20 is lesser than that of Dokki.

The correlation between body weight and egg weight are given in Table 5 that indicates a positive correlation between body weight and egg weight in all cases. The correlation between body weight and egg weight of Dokki was  $\pm 0.325$  and  $\pm 0.082$  at 20<sup>th</sup> and 40<sup>th</sup> week of age respectively. Meritt *et al.*, 1968 have reported body weight- egg weight correlation between  $\pm 0.10$  to 0.50. Jaffe (1966) and Kinney (1969) indicated a strong positive generic correlation between body weight and egg weight, the estimates summarized gave a mean value of and  $\pm 0.35$  whereas, Kinney and Lower (1968) and

Kinney (1969) reported that though the correlation between age after sexual maturity and egg weight in Dokki was found as positive with a range from  $\pm 0.10$  to 0.30, however; the correlation was highly significant (1% level) at the age of 20 weeks and non-significant at 40th week of age in Dokki. In Fayoumi, there was a positive significant correlation between the body weight and egg weight at 20th weeks and 40th week of age as well as it was found in the Dokki breed. Kinney (1969) has reported the value of correlation coefficient to be  $\pm 0.41$ . The correlation was non-significant at 40 weeks of age as he reported in the case of Dokki breed. Total hens at 20 weeks were 110, but few birds died during 20 to 40 weeks. The mortality rate was 6.36% in Dokki and 5.45% in Fayoumi. It was corresponding to the survival/viability of 93.74% in Dokki and 94.55% in Fayoumi

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