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The Effect of Floor Differences in Cages on the Incubation Results and Live Weight of Japanese Quails

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Abstract: This study was carried out to assess the effects of floor differences in cages on the incubation results of quails and live weight. This study was performed in the test units present in Quail Research Department of Canakkale Onsekiz Mart University, Technological and Agricultural Research Center (TETAM) and in the Department of Animal Science of Agricultural Faculty. About 108 hatching eggs were collected from each floor of five story breeding cage to be a group and put into the machine. The results of incubation were calculated at the end of incubation period. The best results were seen in the eggs obtained from the 4th floor. Here, the hatching performance of 72%, fertility rate of 90% and hatching chick of 80%, respectively. The quail hatches based on the groups in cages were grown up in five different groups for a period of 5 weeks. At the end of the 5th week, the highest value with 183.96 g averaged live weight was reached in the quails obtained from the 4th floor. Variance Analysis Technique was used for the statistical evaluation of the data obtained.

Key words: Japan quails, incubation results, live weight, feed consumption, cage, Turkey

INTRODUCTION

Intensive breeding system quail, diseases can be kept under control, the lack of litter problem, many authorities to be easy because of labor and space saving advantages such as 4-5 storey cage breeding is preferred. This is due to differences in times such as quails, some shelter, lighting and temperature in the climatic conditions not provided enough. Quails in this case, delayed age at sexual maturity, falling egg production, egg weight decreases, body weight gain, feed efficiency ratio negatively affected by decreasing incubation results (Nagarajan *et al*., 1991; Morris, 1994; Lewis *et al*., 1999).

Incubation, poultry is an important process to keep the generations. Breeders to produce the desired number and quality of high-quality live chicks, hatching results in a higher required. The results of incubation quails male female ratio, age and live weight of breeding flock, herd health, breeding, genetic factors, mating type, sperm quality, egg weight, storage duration, frequency of placement, maintenance and management (breeding place or a cage) and the feed conditions are effective (Narahari *et al*., 2002; Parizadian *et al*., 2011; Al-Matubsi *et al*., 2011; Christaki *et al*., 2011). Hatching performance, fertility rate and hatching chick rate, many studies have been conducted into the factors mentioned earlier. According to the study of Saylam hatching performance of 63.46%, fertility rate of 88.40 and 71.98% as hatching chick rate, Kucukyilmaz, hatching performance of 57.6%, fertility rate of 78.6 and 73.3% as hatching chick rate, Erensayin, hatching performance of 65.24%, fertility rate of 84.17 and 77.35% as hatching chick rate and Ozbey and Ekmen hatching performance of 69.27%, fertility rate of 86.83 and 79.78% of hatching chick rate, the public and colleagues. According to Toplu hatching performance of 76.73%, fertility rate of 82.46 and 93.05% as hatching chick rate and Sari hatching performance 71.45%, fertility rate of 90.17 and 79.23% reported an hatching chick rate.

Quails, the egg output from the live weight increase rapidly. In particular, the weights of the output period of the 1st 3 weeks of life they reach approximately 6 times the live weight (Jones *et al*., 1997). The female quail, live weight gain is slightly higher in male until the age of maturity (Oguz *et al*., 1996). Quail on live weight gain, a large number of studies have been conducted to investigate the effect of various factors. The 5th week average of live weight, Jones and Huges (1978), 117.0 g, Khalid *et al*. (1986) 177.9 g, Okamoto *et al*. (1989) 122.4 g. According to Ozcan and Akcapinar 182.3 g, Yazgan, 178.3 g and Kirmizibayrak reported a 144.82 g and Balcioglu and Altinel, quails 5th week average live weight,

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females 170.1 and 159.6 g of the men reported. This study was carried out to assess the effects of floor differences in cages on the incubation results of quails and live weight.

MATERIALS AND METHODS

Research, Canakkale Onsekiz Mart University, Technological and Agricultural Research Center in the Quail Production Unit and the Department of Animal Science, Faculty of Agriculture with the trial chambers in December, January and February was conducted between the months.

Animal material in experiment, quail production unit is 75 breeding quail. Adult quails, 17-18% crude protein feed is given. Adult quails at 20°C with a temperature of room lighting was applied 16 h a day. Feed and water *ad libitum* as a given. Five storey cage for breeding quail 1 male 2 female to be placed in each eye. Group 1 the lower level at the base of the topmost group 5 will be classified in the group. For seven days, 1st-5th floor, respectively, 20, 20, 23, 22 and 23 including a total of 108 eggs were collected. After the eggs were weighed, placed incubator machine has been hatching chick. After hatching performance, fertility rate, hatching chick is calculated as the incubation results.

After receiving the output weights of the chicks hatch, creating a one story enlargement cages placed in five different groups. The first group of incubation machine, enlarging cage, the first group to be created in all groups. n groups in order to ensure that equal numbers of quail, selected 10 chicks from each group by chance was put into cages. Chicks sexsual determination in the chest hair the color of the 3rd week and was looking at the distribution. After the determination of gender, determined the number of male and female groups. Total 5 group, 2 male and 8 female, 3 male and 7 female quail are in the other groups.

To chickens during the 5 weeks trial, the 1st week, 23 h and 1 h dark light, the last 2 weeks have been a 10 h light application. Temperature, 36°C in the 1st week and every week applied reduced to 2.5-3°C reduction of 20-24°C. Chickens, the 1st 3 weeks period, 27-28% crude protein with 2800 kcal ME quail starter feed between 3-5 weeks 24% crude protein in the 2600-2800 kcal ME are given feed containing the quail grower. Water to chickens has been given daily *ad libitum* and feed, 30 g of each chick was weighed to be. Thus, the daily feed consumption were determined. Live weight gain of chicks was determined on a weekly basis. Study obtained data on live weight, in order to demonstrate the diversity of groups and by gender, repeated measures analysis of variance technique (repeated measurement) than in the differences in determining the results of incubation, the Z-ratio test was used.

RESULTS AND DISCUSSION

In the study, Japanese quail reared in cages on different floors hatching performance, fertility rate and the hatching chick criteria such as the incubation were investigated. The chicks hatch, live weight and feed intake were investigated such as performance characteristics.

Incubation in the proportional results of the analysis, the highest hatching performance (72%) and fertility rate (90%) 4th floor were found. In the most high hatching chick ratio of 80% 4th and 5th floors were found. Incubation with the lowest results 1st floor, hatching performance, fertility rate and hatching chick was 55, 75 and 73%, respectively (Table 1). Within the cage were not significant ($p>0.05$) differences between the floors.

Saylam shows that hatching performance of 63.46%, fertility rate of 88.40 and 71.98% as hatching chick rate, Kucukyilmaz, hatching performance of 57.6%, fertility rate of 78.6 and 73.3% as hatching chick rate, Erensayin hatching performance of 65.24%, fertility rate of 84.17 and 77.35% as hatching chick rate and Ozbey and Ekmen hatching performance of 69.27%, fertility rate of 86.83 and 79.78% of hatching chick rate, the public and colleagues. Toplu hatching performance of 76.73%, fertility rate of 82.46 and 93.05% as hatching chick rate, Sari hatching performance 71.45%, fertility rate of 90.17 and 79.23% reported an hatching chick rate. The results of this study in terms of the incubation, the best values with 4th floor was obtained from the eggs. On this floor, hatching performance 72%, fertility rate 90% and hatching chick 80%, respectively. This research examined the results of past studies in terms of some values, some of the differences found to have similarities in terms of values.

During the 1st week as the chicks were not significant statistical difference between the output weight ($p\leq0.05$). The differences between the weights of the weight of the chicks out to other weeks, a statistically significant ($p\leq0.05$) were found.

Table 1: Incubation results of Japonica quails and Z-ratio significance test

	Incubation results (%)			
Floors	Hatching performance	Fertility rate	Hatching chick	p-value
1	55	75	73	0.749
2	60	85	70	0.724
3	65	87	75	0.585
4	72	90	80	0.753
5	70	87	80	0.815

Table 2: The mean live weight of Japanese quail on a weekly basis and significance states

Floor	Hatching chick weight	Week 1 weight	Week 2 weight	Week 3 weight	Week 4 weight	Week 5 weight
1	8.02 ± 0.28^{Ea}	10.75 ± 0.64^{Ea}	33.01 ± 3.19^{Da}	71.52 ± 3.90^{Ca}	109.83 ± 4.23^{Ba}	140.99 ± 4.25^{Ac}
2	8.23 ± 0.31^{Ea}	11.11 ± 0.71^{Ea}	33.08 ± 3.22^{Da}	72.07 ± 3.86^{Ca}	110.39 ± 4.25^{Ba}	141.41 ± 4.11^{Ac}
3	7.61 ± 0.26^{Ea}	10.36 ± 0.75^{Ea}	34.23 ± 2.57^{Da}	77.04 ± 4.66^{Ca}	126.42 ± 7.21^{Ba}	164.96 ± 7.50^{Aab}
4	8.98 ± 0.13^{Ea}	12.78 ± 0.41^{Ea}	47.97 ± 1.31^{Da}	91.98 ± 1.64^{Ca}	127.29 ± 2.24^{Ba}	183.96 ± 3.70^{Aa}
5	8.92 ± 0.15^{Ea}	13.75 ± 0.26^{Ea}	43.78 ± 1.14^{Da}	85.27 ± 1.56^{Ca}	122.55 ± 2.26^{Ba}	157.79 ± 4.88^{Abc}

$\bar{X}\pm S_{\bar{x}}$ shows±values; important differences between the averages shown in capital letters on the same floor ($p\leq0.05$); different small letters the same week, the differences between the floors is important ($p\leq0.05$)

Table 3: The mean live weight of male and female quail on a weekly basis and significance states

Sex	Hatching chick weight	Week 1 weight	Week 2 weight	Week 3 weight	Week 4 weight	Week 5 weight
Male	7.84 ± 0.20^{Ea}	10.39 ± 0.53^{Ea}	33.14 ± 2.65^{Db}	72.86 ± 3.72^{Cb}	111.74 ± 4.19^{Bb}	147.20 ± 5.75^{Ab}
Famele	8.55 ± 0.15^{Ea}	12.28 ± 0.35^{Ea}	40.44 ± 1.50^{Da}	82.19 ± 1.97^{Ca}	122.24 ± 2.43^{Ba}	161.95 ± 3.59^{Aa}

$\bar{X}\pm S_{\bar{x}}$ shows ±values; showing the different capital letters of the same sex, the differences between the mean weeks is important ($p\leq0.05$); different small letters the same week, the differences between averages sex is important ($p\leq0.05$)

Output from the weight of chicks, quail until the 4th week of live weight does not change according to the differences between the floors of the differences between the floors is not statistically significant ($p\leq0.05$) is observed. At of the end of 5th week of the experiment, the highest live weight (183.96 g) is seen with the 4th floor, between 1st, 2nd and 5th floor statistically significant ($p\leq0.05$) shows a difference (Table 2).

About 5 weeks long study, the highest average live weight, 183.96 g live weight reached 4th floor quail were obtained. At the end of the experiment, average live weight 140.99 g, 1st floor has the lowest group. This 2 floor between difference the observed near 43 g, it is very important to breeding. Because under the same conditions quail have gained higher live weight, 4th floor.

The 5th week average of live weight, Jones and Hughes (1978) 117.0 g, Khalid *et al.* (1986) 177.9 g, Okamoto *et al.* (1989) 122.4 g, Ozcan and Akcapinar, 182.3 g, Yazgan, 178.3 g and Kirmizibayrak and Altinel reported a 144.82 g. Values in the literature, the study gives the best result 4th floor quail 183.99 g is lower than the value of the live weight. However, the study mean live weight from the other floors, the results of the literature seem to have almost similar. This difference in the literature studies, the average live weight of all of the cage may be due to being covered. Because the results of this study were calculated separately on each floor of the cage.

During the trial, the female quail male quails that they have a higher live weight is observed. Both sexes with the weight of chicks out differences between the weights of 1st week, a statistically insignificant ($p\leq0.05$) were found. Japanese quail females, males have more of live weight. Chicks of this weight difference, usually 3-4 emerge a week (Oguz *et al.*, 1996). In this study, live weight differences between male and female quail 2 apparent since weeks. Balcioglu quails 5th week average live weight, females 170.1 and 159.6 g of the men reported. In this study, the female quail live weight averaged 161.9 and 147.2 g of the men, respectively (Table 3). These values are lower than literature.

Table 4: Japanese quail as a weekly live weight gain

	Live weight gain (g)				
Weeks	Floor 1	Floor 2	Floor 3	Floor 4	Floor 5
1	2.721	2.885	2.750	3.803	4.836
2	22.262	21.965	23.861	35.125	30.023
3	38.506	38.989	42.813	44.074	41.498
4	38.314	38.324	49.386	35.309	37.273
5	31.167	31.014	38.532	56.673	35.239

Table 5: Japanese quail at the end of the trial of live weight and feed consumption values

Floor	Live weight (g)	Total feed intake (g)
1	140.99	4307
2	141.41	4526
3	164.96	5053
4	183.96	5425
5	157.79	4764

At the end of the experiment, the highest increase in live weight gain 56.673 g 4th floor reached. 4th floor quail, 4th week was the lowest live weight gain. The 5th week, with the values of live weight gain 1st-5th floor values are close to each other is (Table 4). Closer to the ground floors of the cages, live weight and feed consumption values is actually lower (Table 5). Insufficient growth of quail in the lower floors, light and temperature can result in homogeneously not dispersed. Quails, the lower floors due to low temperatures, gathered together try to protect their body temperatures. In this case, sufficient growth may not be shown. In addition if the light homogeneously not dispersed, the lower floors and the dark areas may occur in animals such as feed and water trend, activities can be reduced. As researchers know, light and temperature, poultry, growth, development, yield and quality which is effective on the important environmental factors. Before due to the warming of the air upward, the upper floors, the temperature increases. Increase in temperature may result in decreased feed intake and quails, performance may decline. In addition due to the

lighting equipment hanging from the ceiling, the upper floor, quail and engage in more light being exposed to stress such as kannibalizm and illnesses can develop. Such negative, quails, egg production and decrease in quality, reduction in the number of fertile eggs and animals can cause decline in health.

CONCLUSION

According to the results of this study, obtained from the cage 4th floor eggs, hatching performance, fertility rate and hatching chick, obtained from the quail such as live weight and feed consumption, performance characteristics that are better than the other floors.

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