



## Performance of Quail with Different Hatch Body Weight by Fasting Treatment Post-hatch

### AUTHORS INFO

---

**Bahri Syamsuryadi**

Sekolah Tinggi Ilmu Pertanian Muhammadiyah  
Sinjai  
[bahrissyamsuryadi25@gmail.com](mailto:bahrissyamsuryadi25@gmail.com)  
085299255242

**Khaeruddin**

Sekolah Tinggi Ilmu Pertanian Muhammadiyah  
Sinjai  
[Erukhaeruddin@gmail.com](mailto:Erukhaeruddin@gmail.com)  
085241620927

### ARTICLE INFO

---

e-ISSN: 2548-3803  
p-ISSN: 2548-5504  
Vol. 3, No.2, December 2018  
URL: <http://dx.doi.org/10.31327/chalaza.v3i2.815>

---

© 2018 CJAHA All rights reserved

### Abstract

The purpose of this study was to determine the relationship of broiler quail's initial body weight which is fastened at post-hatch to growth and attainment the last body weight. One hundred thirty-five quails aged 12 post-hatch had kept in a cage plot which had prepared based on a completely randomized design with 3x3 factorial pattern and three replications which each replication consisted of 5 quails. The first factor is body weight post-hatch (B) consist of  $B_1 = 5.1 - 6.0$  g (light),  $B_2 = 6.1 - 7.0$  g (medium) and  $B_3 = 7.1 - 8.0$  g (heavy), the second factor is the duration of fasting post-hatch (P) consist of  $P_1 = 24$  hours,  $P_2 = 36$  hours and  $P_3 = 48$  hours. The observed parameters to fasting were feed consumption, body weight, and feed conversion. The result of this study is the quail with light early body weight (5.1-6 g) post hatch showed that the lightest last body weight is related to the value of feed conversion. Accession good performance of quail can be reached by access feed approximately 24 hours.

**Keywords:** hatch weight, fasting, performance, quails

### A. Introduction

Quail (*Coturnix-coturnix japonica*) has long been cultivated as an egg and meat producer. Females quail are commonly grown to produce an egg, while male quail is not used as a male that can be used as a meat source. Male quail is still getting less attention because quail breeding is always focused on laying quail, whereas quail's meat is already favored commodity by society.

Rapid growth rates on broiler quail are primarily due to the improvement of feed quality and appropriate setting of environment condition so that the last body weight is 172 grams which can be reached during 35 days (Alkan, Karabag, Galic, & Balcioglu, 2008).

Several factors related to eggs, and quail chicks' condition post-hatch can influence the optimal growth rate and reach optimal performance. Characteristic of eggs, especially egg

weight (Alkan *et al.*, 2008), handling of newly hatched quail chicks such as the expenditure time of chicks from the hatching rack (Farooq, Mian, Murad, Durrani, Asghar, & Muqarrab, 2001), selection and vaccination activities, and transportation conditions until the enlargement (Willemsen, Debonne, Swennen, Everaert, Careghi, Han, Bruggeman, Tona, & Decuypere, 2010) is an early growing condition in poultry that determines the attainment of last performance.

Quail chicks hatch with varying weights depends on age and egg weight (Ipek, Sahan, & Yilmaz, 2004). Murad, Farooq, Mian, & Muqarrab (2001) suggested that elderly mothers produce eggs will produce quail chicks with a higher hatching weight than eggs are produced from younger mothers. Furthermore, Ipek *et al.* (2004) reported that more massive quail chicks at hatch would reach a higher last weight than lighter quail chicks, the improvement of previous weight' mean was 5 to 8 g if 1 g improvement of hatch weight.

In financial conditions, quail chicks can be retained about 24-48 hours since hatching until the process of sending quail to farmer's enlarged cage with a location that far enough from the hatchery location (Lamosova, Macajova & Zeman, 2004). During this period, quail chicks usually do not get ration or drinking water intake. The condition is reported to lead to weight loss, mobilization of body energy reserves stored in muscle and liver during the fasting period (Peebles, Burnham, Walzem, Branton, & Gerard, 2004; and Vargas, Baratto, Magalhães, Maiorka, & Santin, 2009).

The weight loss occurs after hatching, reportedly depends on the length of time required until the outer feed replaces the role of yolk which is the primary source of nutrition in the newly hatched quail (Lamosova *et al.*, 2004). However, there is no information about the magnitude of weight loss that occurs in quail chicks with different early weight when fasting post hatch and its effect on the last performance of the broiler quail. Therefore, it is necessary to conduct research which aims to get information about the relationship between quail broilers that is fastened post hatch to the growth and attainment of last body weight. Furthermore, it is used as a basis to improve the aspects of broiler quail's maintenance management so that the previous performance can be achieved more optimally.

## B. Methodology

### 1. Research Design

The study used 135 quails ages 12 hours after hatching, kept in a cage plot, prepared by Completely Randomized Design with 3 x 3 factorial pattern and three replications which each replication consisted of 5 quails. The first factor is weight post hatch (B) consists of  $B_1 = 5.1 - 6.0$  g (light),  $B_2 = 6.1 - 7.0$  g (medium) and  $B_3 = 7.1 - 8.0$  g (heavy), Second factor is the length of fasting post hatch (P) consists of  $P_1 = 24$  hours,  $P_2 = 36$  hours and  $P_3 = 48$  hours.

### 2. Research procedures

The cage plot is 0.50 x 0.50 x 0.30 m (each cage is filled with five quails), and each is equipped with an incandescent lamp (60 Watt), a dining area, and a drinking pot — the combination of weight treatment post hatch by commercial standards: light (5.1-6.0 g), medium (6.1-7.0 g) and heavy (7.1-8.0 g), and fasting respectively for 24 hours, 36 hours and 48 hours.

The incandescent lamps were used in each row of cages as light sources and heaters. The use of incandescent bulbs as heaters was performed in chickens aged 1 - 10 days; in this period the cage was isolated with transparent plastic to avoid heat release in the cage plot environment. On the 11<sup>th</sup> day until the end of the study period (35 days), used two fluorescent lamps 40 Watt as sources of internal lighting which were placed about 2.5 m above the cage plot.

The used feed is a commercial ration consisting of grain feed (*crumble*) that was given in the starter phase aged 1-14 and mixed feed between commercial concentrate and corn with a ratio of 33: 67% for the *financer phase* of 15-35 days and the given water is water *leading*.

## C. Result and Discussion

The initial condition of the more massive quail chicks at the beginning of the study showed the best weight which this indicated a growth consistency rate than the lighter quail chicks although got fasting treatment. At fasting treatment without equilibrium new influence, the quail showed improvement of feed intake levels by the length of fasting (Table 1). The level of fasting over 36 hours indicated the increase in feed consumption percentage.

**Table 1. Quails' feed consumption (g/e/h) with different hatch weight which fasting post hatch**

Feed Consumption (g/e)	Weeks						Total (g/e)
	I	II	III	IV	V	VI	
Early weight (B)							
a) light	1.92±0.17 <sup>a</sup>	7.43±0.60 <sup>c</sup>	9.81±1.84 <sup>a</sup>	12.72±1.19 <sup>a</sup>	14.54±2.56 <sup>a</sup>	23.32±2.21 <sup>a</sup>	488.25±42.33 <sup>a</sup>
b) medium	2.32±0.13 <sup>b</sup>	5.87±0.86 <sup>a</sup>	11.85±1.05 <sup>c</sup>	15.72±1.42 <sup>b</sup>	18.53±2.07 <sup>c</sup>	24.85±0.68 <sup>b</sup>	553.94±18.92 <sup>c</sup>
c) heavy	2.95±0.44 <sup>c</sup>	7.09±0.86 <sup>b</sup>	10.24±3.21 <sup>b</sup>	16.04±3.44 <sup>c</sup>	16.88±2.31 <sup>b</sup>	25.16±0.85 <sup>c</sup>	548.59±62.54 <sup>b</sup>
<i>P value</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Fasting(P)							
a) 24 hours	2.23±0.23 <sup>a</sup>	7.19±0.80 <sup>c</sup>	8.49±2.59 <sup>a</sup>	13.08±0.72 <sup>a</sup>	14.89±1.42 <sup>a</sup>	23.24±2.22 <sup>a</sup>	483.68±36.26 <sup>a</sup>
b) 36 hours	2.53±0.63 <sup>b</sup>	6.44±0.94 <sup>a</sup>	11.90±1.55 <sup>c</sup>	14.12±1.99 <sup>b</sup>	15.78±2.91 <sup>b</sup>	25.34±0.64 <sup>c</sup>	532.72±49.16 <sup>b</sup>
c) 48 hours	2.44±0.58 <sup>b</sup>	6.76±1.16 <sup>b</sup>	11.51±0.66 <sup>b</sup>	17.30±2.72 <sup>c</sup>	19.28±1.56 <sup>c</sup>	24.74±0.52 <sup>b</sup>	574.29±26.55 <sup>c</sup>
<i>P value</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000
<i>P value (BxP)</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000

ABC Different Superscript follow mean in the column, and the same treatment factor showed a significant difference(P<0.01)

Quails with the lighter initial weight at pre-maintenance are indicated lower feed-consumption ability than the more substantial weight quail, but this condition is not related to the duration of fasting. It shows that the level of quail's nutritional needs in the light group is also lighter. It suggests that the higher dietary requirements for the more substantial weight quail. A similar condition was reported by Ipek et al. (2003), lighter initial weight of 5.8 g also produces the light last weight of 151.2 g while in the broad category, 7.4 g obtains the previous mass of 172.8 g. Other studies by Adeyanju, Abiola, Adegbite, & Adeyanju (2014) stated that quail eggs weight 8.91 g produces a hatching weight of 5.74 g and egg weight of 10.76 g produces a hatching weight of 7.15 g.

**Table 2. The quails' body weight gain and the last weight (g/e) with different hatch weight which fasting post hatch**

Body weight gain (g/e)	Weeks						Total (g/e)
	I	II	III	IV	V	VI	
Early weight (B)							
a) light	11.98±1.94 <sup>a</sup>	25.14±3.02 <sup>a</sup>	25.91±4.25 <sup>a</sup>	23.31±2.78 <sup>a</sup>	11.63±2.14 <sup>b</sup>	9.77±1.37 <sup>a</sup>	107.74±10.93 <sup>a</sup>
b) medium	12.75±1.02 <sup>b</sup>	24.78±1.09 <sup>a</sup>	28.92±3.38 <sup>b</sup>	27.30±5.50 <sup>b</sup>	9.83±1.28 <sup>a</sup>	11.92±1.21 <sup>b</sup>	115.50±2.07 <sup>b</sup>
c) heavy	12.50±0.96 <sup>b</sup>	26.37±2.62 <sup>b</sup>	27.34±2.37 <sup>a</sup>	24.47±2.06 <sup>a</sup>	14.33±2.28 <sup>c</sup>	10.57±1.34 <sup>ab</sup>	115.57±4.15 <sup>b</sup>
<i>P value</i>	0.046	0.000	0.000	0.000	0.000	0.014	0.000
fasting (P)							
a) 24hours	13.31±1.39 <sup>b</sup>	25.94±2.50 <sup>b</sup>	29.05±1.88 <sup>b</sup>	23.19±2.29 <sup>a</sup>	14.10±2.31 <sup>b</sup>	10.95±1.55	116.54±2.79 <sup>b</sup>
b) 36 hours	11.76±0.87 <sup>a</sup>	24.49±2.56 <sup>a</sup>	25.85±4.95 <sup>a</sup>	23.83±2.19 <sup>a</sup>	10.54±1.42 <sup>a</sup>	10.51±1.92	106.99±9.50 <sup>a</sup>
c) 48 hours	12.16±1.39 <sup>a</sup>	25.86±2.10 <sup>b</sup>	27.26±2.52 <sup>a</sup>	28.06±1.80 <sup>b</sup>	11.15±2.74 <sup>a</sup>	10.80±1.24	115.28±5.30 <sup>b</sup>
<i>p value</i>	0.000	0.000	0.000	0.000	0.000	0.790	0.000
<i>P value (BxP)</i>	0.000	0.000	0.000	0.000	0.023	0.617	0.000

ABC Different Superscript follow mean in the column, and the same treatment factor showed a significant difference(P<0.01)

Weight gain during maintenance at low initial weight treatment until the sixth week did not sustain rapid growth after fasting; different things in medium weight had experienced compression growth in the first week to the sixth week with quail get feed by ad libitum during the study. This case is associated with the lower amount of feed that has been consumed, especially in lighter initial weight group (5.1-6.0 g) than the group (6.1-7.0 g) and (7.1-8.0 g). In line with this, Ipek et al., (2004) stated that weight gain based on initial weight with light category of 5.8 ± 0.21 g, in the first week of 20.7 ± 0.78 g with feed intake of 55.0 ± 0.92 g, in the fifth week of body weight quail average 151.2 ± 4.18 g with feed consumption 145.5 ± 4.16 g.

Ad libitum feeding post hatch shows a significant impact on the growth rate at the sixth week of all levels of occupation post-hatch. However, quail with 36 and 48 hours of fasting, showed a relatively light final weight achieving a rate of 106.99 and 115.28 g. It indicates that the recovery process of quail conditions that experienced delayed access to feed and drink after hatching more than 36 hours is not able to walk. The fasting treatment after hatching in some

studies indicates there is no a rapid growth rate or so-called compensatory growth. According to Lamosova et al. (2004) reported that female quail without ultimate weight fasting ( $136.9 \pm 4.4$  g), 12 hours fasting ( $132.1 \pm 8.2$  g), 24 hours fasting ( $131.9 \pm 3.8$  g) and 48 hours ( $113.2 \pm 13.7$  g) have same results for the male quail with no final weight ( $123.6 \pm 3.3$  g), 12 hours ( $113.5 \pm 13.4$  g), 24 hours ( $109.3 \pm 1.7$  g) and 48 hours ( $106.3 \pm 4.1$  g)

**Table 3. The quails' feed conversion ratio (FCR) with different hatch weight which fasting post hatch**

FCR	Weeks						Total (g/e)
	I	II	III	IV	V	VI	
Initial weight (B)							
a) Light	1.14±0.17 <sup>a</sup>	2.08±0.11 <sup>c</sup>	2.74±0.73 <sup>b</sup>	3.84±0.24 <sup>a</sup>	9.08±2.61 <sup>a</sup>	17.05±3.20	5.99±0.85
b) Medium	1.28±0.10 <sup>b</sup>	1.65±0.18 <sup>a</sup>	2.88±0.20 <sup>ab</sup>	4.11±0.49 <sup>a</sup>	13.48±2.86 <sup>b</sup>	14.74±1.67	6.36±0.56
c) Heavy	1.65±0.19 <sup>c</sup>	1.88±0.11 <sup>b</sup>	2.64±0.89 <sup>a</sup>	4.66±1.27 <sup>b</sup>	8.54±2.19 <sup>a</sup>	16.90±2.17	6.05±0.70
<i>P value</i>	0.000	0.000	0.011	0.000	0.000	0.051	0.092
Fasting (P)							
a) 24 hours	1.19±0.22 <sup>a</sup>	1.94±0.06 <sup>b</sup>	2.03±0.54 <sup>a</sup>	3.98±0.45 <sup>a</sup>	7.68±2.04 <sup>a</sup>	15.11±2.54	5.32±0.48 <sup>a</sup>
b) 36 hours	1.49±0.28 <sup>c</sup>	1.85±0.30 <sup>ab</sup>	3.27±0.34 <sup>c</sup>	4.14±0.44 <sup>a</sup>	10.65±2.47 <sup>b</sup>	17.37±3.03	6.46±0.35 <sup>b</sup>
c) 48 hours	1.39±0.21 <sup>b</sup>	1.83±0.24 <sup>a</sup>	2.97±0.21 <sup>b</sup>	4.49±1.33 <sup>b</sup>	12.77±3.37 <sup>c</sup>	16.22±1.75	6.61±0.38 <sup>b</sup>
<i>p value</i>	0.000	0.014	0.000	0.003	0.000	0.094	0.000
<i>P value (BxP)</i>	0.037	0.000	0.000	0.000	0.000	0.083	0.224

ABC Different Superscript follow mean in the column, and the same treatment factor showed a significant difference ( $P < 0.01$ )

Compensation growth which is a rapid growth phenomenon in quail that experienced delayed access to feed at the beginning of growth and is restored by ad libitum feeding which can be optimized quail growth rate. Some reports stated that generally, quails could grow better than the quail is not fasting, but the capacity depends on the length of fasting (Lamasofa et al., 2004).

Restriction of feed access after hatching showed an effect on feed conversion rate which represents the efficiency level of feed used. Lower feed efficiency is at 36 and 48 hours of fasting with different initial quail weights. Improvement of feed intake was not followed by weight gain, so for conversion value is less feed on less than 24 hours. The results of Ipek et al., (2004) study showed that feed conversion with light initial weight ( $5.8 \pm 0.21$  g) had a feed conversion of 3.63 whereas feed conversion of 3.50 was obtained at the earliest heavyweight ( $7.4 \pm 0.51$  g).

#### D. Conclusion

The earliest weighing quail post hatch shows the lightest final weight in line with the feed conversion value. Attainment of good performance in quail can be attained with access to feed no more 24 hours.

#### E. Acknowledgment (optional)

Acceptance in submitted to the Dirjen Dikti for the grant aid of the Beginner Lecturer research 2018, so that this study could take palace.

#### F. References

- Adeyanju, T. M, Abiola, S. S., Adegbite, J. A., & Adeyanju, S. A. (2014). Effect of egg size on hatchability of Japanese quail (*Coturnix coturnix japonica*) chicks. *Journal of Emerging Trends in Engineering and Applied Sciences*, Vol. 5(7), pp. 133-135.
- Alkan, S., Karabag, K., Galic, A., & Balcioglu, M. S. (2008). Effects of genotype and egg weight on hatchability traits and hatching weight in Japanese quail. *South African Journal of Animal Science*, Vol. 38 (3).
- Farooq, M., Mian, M. A., Murad, A., Durrani, F. R., Asghar, A., & Muqarrab, A. K. (2001). Egg traits of Fayumi birds under subtropical conditions. *Sarhad J. Agric.* Vol. 17 (2), pp. 141-145.
- Ipek, A., Sahan, U., & Yilmaz, B. (2004). Effect of hatch weight on the performance of Japanese Quails (*Coturnix coturnix japonica*) during growth and egg production period. *Arch. Geflugelk*, Vol. 68 (6), pp. 280-283.

- Lamosova, D., Macajova, M., & Zeman, M. (2003). Effects of Short-term fasting on selected physiological functions in adult male and female Japanese Quail. *ACTA VET, Vol. 73*, pp. 9-16.
- Murad, A., Farooq, M., Mian, M. A., & Muqarrab, A. K. (2001). Hatching performance of Fayumi eggs. *Sarhad J. Agric, Vol. 17 (1)*, pp. 1-6.
- Peebles, E.D., Burnham, M. R., Walzem, R. L., Branton, S. L., & Gerard, P. D. (2004). Effects of fasting on serum lipids and lipoprotein profiles in the egg-laying hen (*Gallus domesticus*). *Comparative Biochemistry and Physiology, Part A, Vol. 138*, pp. 305-311
- Vargas, F S. C., Baratto, T. R., Magalhães, F. R., Maiorka, A., & Santin, E. (2009). Influences of breeder age and fasting after hatching on the performance of broilers. *Poult. Sci, Vol. 18*, pp. 8-14.
- Willemsen, H., Debonne, M., Swennen, Q., Everaert, N., Careghi, C., Han, H., Bruggeman, V., Tona, K., & Decuyper, E. (2010). Delay in feed access and spread of hatch: the importance of early nutrition. *World's Poult. Sci., Vol. 66*, pp. 177 - 188.