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Effect Of Egg Weight On Hatchability And Hatching Weight Of Quail (*Cortunix cortunix Japonica*)

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ABSTRACT

The research was conducted to determine the fertility, hatchability and hatching weight of quail (Corturnix-corturnix japonica) eggs in various egg weights. The research was carried out experimentally using a Randomized Block Design (RAK) consisting of 3 treatments and 4 replications. This research will be carried out from October to December 2020 at Kandang Puyuh, Kasih Ibu Orphanage, Jalan Bali, Bengkulu City. The tools used in this research were 4 manual hatching machines, box-shaped with a capacity of around 300 quail eggs, scales and an electrical energy source. The materials used are 300 quail eggs and disinfectant. The research was carried out experimentally using a Randomized Block Design (CRD) with 3 treatments and 4 replications. The treatment applied is egg weight consisting of: B1 = Light (≤9.5g), B2 = Medium (9.6 – 10.5g), B3 = Heavy (≥10.6g)

INTRODUCTION

The development of various types of livestock, including quail, is an effort to maximize the potential of livestock commodities in providing animal protein to meet community needs. Quail were developed to produce eggs and meat. However, their contribution is still relatively small compared to the contribution of other poultry commodities such as chickens and ducks. The quail that we know today consists of two types, namely wild quail or Gemak and domesticated/crossed quail (Cortunix-cortunix japonica). Wild quail have very low egg production but have the ability to incubate their eggs; on the other hand, cross-bred quail have high egg production but have lost the ability to incubate their eggs. This means that the regeneration process of cross-breed quail is only possible through artificial hatching using hatching machines. Quail eggs produced by cross-bred parents have a high diversity and exterior characteristics, including the aspect of egg size/weight. To produce maximum hatchability and hatching weight, a selection of hatching eggs needs to be carried out. Egg weight is one indicator in selecting hatching eggs. The weight of the egg will affect the success of hatching because the weight of the egg greatly influences the composition of the egg,

which is a source of food during embryo growth. However, in reality, breeders often choose eggs for hatching without paying attention to the exterior quality of the egg, especially the weight of the egg, and many breeders even choose eggs that are too heavy or too light. Variations in egg weight are one of the causes of low fertility, hatchability and hatching weight of eggs, which are commonly found in poultry hatcheries.

The type of quail that is usually bred comes from the Coturnix-coturnix japonica type. The productivity of quail eggs reaches 250-300 eggs per year, with an average of 10 grams per egg. The female starts laying eggs at the age of 35 days. Quail are very good for breeding because they can produce more than 4 generations per year. The eggs are dark brown, blue and white with black, brown and blue spots. Food factors have quite a big influence. If the quality of the food given is not good or the amount given is not enough, then it is almost certain that the quail will not lay many eggs (Rasyaf, 1991; Listiyowati & Roospitasari, 2000; Hartono, 2004).

The protein and fat content of quail eggs is quite good when compared to other poultry eggs. The protein content is high, but the fat content is low, so it is very good for health. Quail chicks that have just hatched from eggs are called DOQ (Day Old Quail). This day-old quail is the size of a finger, weighs 8-10 grams and has fine needle hair. A healthy day-old quail has fluffy yellow fur, moves quickly, is usually uniform and actively looks for food or drink. In the world of animal husbandry, the DOQ rearing period is called the starter-grower (stagro) period until the quail chicks are 8 weeks old (Sugiharto, 2005).

The extent to which variations in quail egg weight affect the success of the hatching process, especially those related to hatchability and hatching weight, needs to be studied. Based on this, this research aimed to examine the effect of egg weight on hatchability and hatching weight of quail eggs hatched artificially using an incubator. Meanwhile, the expected use is as reference material for breeders and academics regarding the influence of egg weight on the success of hatching using an incubator.

MATERIALS AND METHODS

Time and Place

This research will be carried out from October to December 2020 at Kandang Puyuh Kasih Ibu Orphanage, Bali Street, Bengkulu City.

Research Materials

The equipment used in this research is 1 unit of the manual incubator, box-shaped with a capacity of around 300 quail eggs, scales and an electrical energy source. The materials used are 300 quail eggs and disinfectant.

Research Design

The research was carried out experimentally using a Completely Randomized Design (CRD) with 3 treatments and 4 replications. The treatment applied is egg weight, which consists of the following:

A = Light (≤9.5g)
B = Medium (9.6 – 10.5g)
C = Heavy (≥10,6g)
Implementation of Hatching

Selection of Hatching Eggs

Agromedia (2002) states that hatching eggs is a form of accumulation of nutrients such as protein, carbohydrates, fat, energy, vitamins, minerals and water, which are needed for embryo growth during incubation. In order for them to be hatched, quail eggs must be selected. Selecting quail eggs to hatch must be careful; several ways to select good quail eggs for hatching are: 1) Selecting eggs that are clean, smooth and even; 2) Choose eggs whose color is not too dark; 3) Eggshell spots must be clear; 4) the egg shell is not cracked; 5) choose new eggs, not eggs that have been stored for more than 7 days; 6) If you want to use it specifically as an egg after it comes out of the quail, the egg must be taken and cleaned.

It is recommended that the eggs hatched be of normal size, weighing 11-13 grams per egg. This normal size can be achieved after the mother is 2.5 months old. Thus, quail-hatching eggs are collected when the parents are 2.5-8 months old (Sugiharto, 2005).

The length of egg storage can affect the hatchability of quail eggs. Abidin (2003) strengthened this opinion by providing data from research results that the hatchability of eggs stored for 6 days was higher compared to hatching eggs stored for 7 days. Eggs that are stored for too long, especially in unfavorable environmental conditions, can cause egg weight to decrease and the air sacs to decrease (Andrianto, 2005).

Hatching With Hatching Machines

Quail eggs can be hatched using a chicken egg incubator. During hatching, the egg is rotated 900 times and at least 4-6 times a day. Hatching quail eggs is no different from chicken eggs. First week: 38.30 C (1010 F). Second week until hatching: 390 C (1030 F). Try not to keep the temperature more than 39.40 C (1030 F). The thermometer that measures the temperature of the hatching machine must be placed parallel to the tip of the egg, with the aim that the thermometer showing the temperature of the eggs being hatched. The humidity temperature should not be less than 60% (wet tube on the hygrometer) 30.60 C (870 F) until the 14th day, after which it is increased to 32.20 C (900 F) until the hatching process is complete (Nugroho & Mayun, 1986).

Hatching Machine Temperature

In practice, the hatching machine temperature is often kept stable at around 103 0F (39.4 0C) for all hatching poultry eggs. The humidity of hatching machines for hatching eggs for various types of poultry is relatively the same, namely around 60-79% RH. During preparation, the top ventilation of the hatching machine is closed until the third hatching day (Suprijatna et al., 2005).

Egg Turning

Turning the eggs is done every day from the third or fourth day until two days before the eggs hatch. Spinning the eggs should be done at least 3 times, or it is better to spin up to 5 or 6 times a day, half a turn (Djanah, 1984).

RESULT AND DISCUSSION

The average value of data analysis in the form of hatchability and hatching weight from samples of 3 treatments of quail eggs with different weights can be seen in Table 1 below.

Table.1 Average results of analysis of hatchability and hatching weight of quail eggs during the research

Variable	A	B	C	Average
Hatchability (%)	70,63[a]	80,00[b]	76,25[ab]	75,62
Hatching Weight (gr)	7,19[a]	8,03[b]	8,21[b]	7,81

Note: Superscripts followed by different lowercase letters in the same column indicate very significant differences (P<0.01) between treatments

Hatchability

The results of research on the average hatchability of eggs hatched with different egg weights are presented in Figure 1.

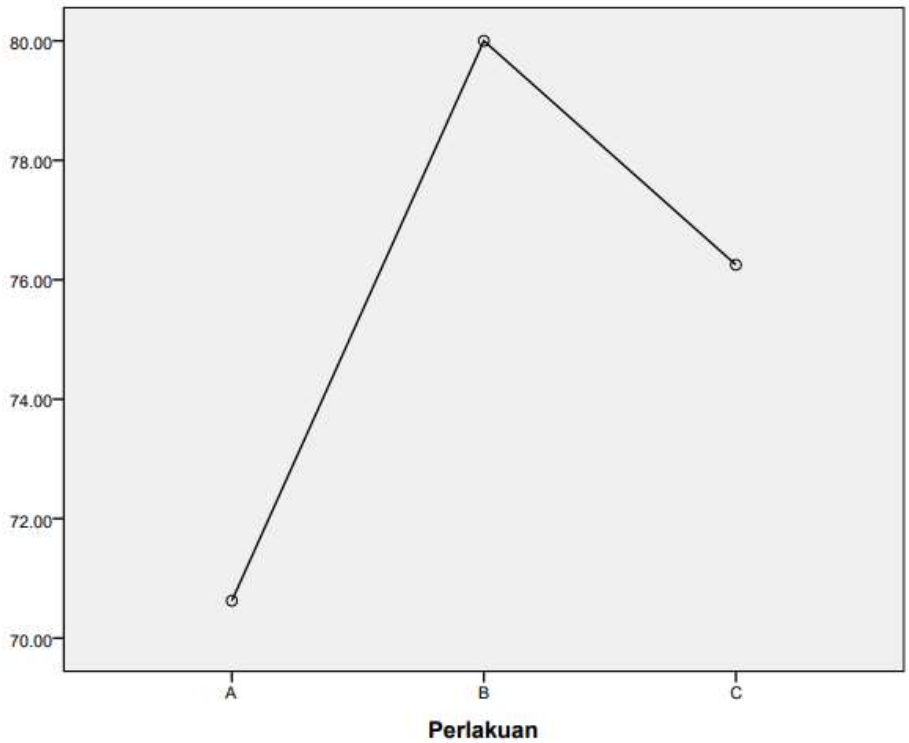


Figure 1. The effect of egg weight on the hatchability of quail eggs.

Based on the results of the research carried out, the average hatchability in treatments A (light eggs), B (medium eggs), and C (heavy eggs) were 70, 63, 80.00 and 76.25%, respectively, with an average percentage of overall hatchability namely 75.62%. The research results of Adeyanju *et al*. (2014), which used Japanese quail with different varieties, were 41% and Dudusola (2013) 81.2%. The results of the analysis of variance showed that egg weight treatment had a significant effect on the hatchability of quail eggs. Medium-weight eggs (9.6-10.5 gr) showed the best results. This indicated that egg weight had a significant influence on egg hatchability. Many factors influence egg hatchability, storage methods, temperature and humidity settings in the incubator, egg cleanliness, egg collection and storage (Nazirah, 2014). Sutiyono (2006) added that egg storage, genetic factors, temperature and humidity, parent age, egg cleanliness, egg size, egg nutrition and fertility influence egg hatchability.

Hatching Weight

Hatching weight is one of the determinants of the success of hatching efforts. Therefore, selection is needed to select eggs that come from healthy parents. The results of research on the average weight of hatchlings hatched with different egg weights are presented in Figure 2.

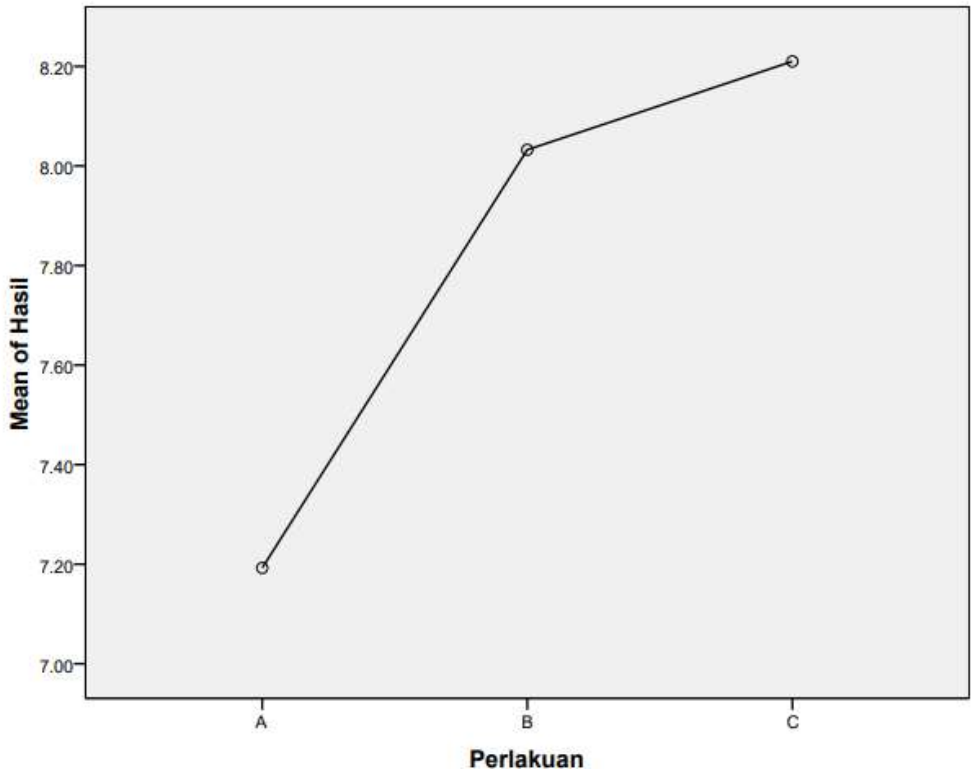


Figure 2. The effect of egg weight on the hatching weight of quail eggs. Different letters indicate significant differences (P<0.05).

Based on the results of the analysis of variance, it shows that egg weight has a real influence on hatching weight. The DMRT test results indicated that the highest treatment was treatment C (heavy eggs), 8.21 g/head, not significantly different from treatment B (medium) 8.03 g/head and significantly different from A (light) 7.19 g/head. Condition This shows that the heavier the egg, the higher the hatching weight. This is because eggs that have a higher weight have a greater composition percentage. According to Science (2011), eggs have several main components; each component has its function. The eggshell functions as a protector for the embryo from unfavorable external disturbances. The shell also functions to protect the egg white and egg yolk from coming out and being contaminated by unwanted substances. In general, the average hatching weight in this study was 7.81 g, higher than the research results of Adeyanju *et al*. (2014) of 6.35 g. This is because the weight of the hatching eggs used is different.

CONCLUSION AND SUGGESTION

Conclusion

Based on the results and discussion, it can be concluded that the hatchability and hatching weight of quail eggs are greatly influenced by egg weight, with the highest

hatching weight shown in the treatment with heavy quail eggs. In contrast, the highest hatchability was shown in the treatment with medium egg weight.

Suggestion

To get maximum hatching power and weight of quail eggs, it is best to hatch eggs using medium-sized eggs.

REFERENCES

Adeyanu, T.M., S.S. Abiola, J.A. Adegbite, and S.A. Adeyanju. 2014. Effect of egg size on hatchability of Japanese quail (Coturnix-Coturnix Japonica) of Japanese quail. Journal of Emerging Trends in Engineering and Applied Sciences (JETEAS) 5(7): 133-135.

Agromedia. 2002. Puyuh Si Mungil Yang Penuh Potensi. Agromedia Pustaka, Jakarta.

Andrianto, T.T. 2005. Panduan Praktis Beternak Burung Puyuh, Absolut, Yogyakarta.

Butcher, D. Gary and R.D. Miles. 2004. Egg Specific Gravity – Designing a Monitoring Program. University of Florida.

Card, L.E. and Leslie. 1993. Poultry Production. Lea and Febriger, Philadelphia. Djanah, D.J. 1984. Beternak Ayam dan Itik, Jasaguna, Jakarta.

Dudusola, I.O. 2013. The effect of parental age and egg weight on fertility, hatchability and day-old chick weight of Japanese quail (Cortunix cortunix japonica). Journal of Agricultural Sciences (2): 13–16.

Gaspersz, V. 1991. Metode Perancangan Percobaan. Penerbit Amrico. Bandung. Hartono, T. 2004. Permasalahan Burung Puyuh dan Solusinya. Penebar Swadaya, Jakarta.

Hassan, K.H., A.R.B. Alsattar. 2015. Effect of Egg Storage Temperature and Storage Period Pre-incubation on Hatchability of Eggs in Three Varieties of Japanese Quail. Journal Animal and Veterinary Sciences ; 3 (6-1): 5-8

Heuser, G.F. 1975. Feeding Poultry. 2 Ed. John Willey and Sons. New York. Listiyowati, E. dan K. Roospitasari. 2000. Burung Puyuh tata Laksana Budidaya Secara Komersil. Penebar Swadaya, Jakarta.

Nazirah. 2014. Pengaruh Lama Penyimpanan Telur Puyuh (Coturnix coturnix japonica) Terhadap Daya Tetas dan Berat Telur (Skripsi). Fakultas Kegiatan dan Ilmu Pendidikan. Universitas Syiah Kuala Darussalam, Banda Aceh.

Nugroho dan Manyun IGT. 1986. Beternak Burung Puyuh. Eka Offest, Semarang.

North, M.O. and D.D. Bell. 1990.Commercial Chicken Production Manual. 4 th Ed. Avi Book, Nostrand Reinhold, New York.

Nuryati, L.K. Sutarto dan S.P. Hardjosworo. 2000. Sukses Menetaskan Telur, Penebar Swadaya, Jakarta.

Rasyaf M. 1991. Memelihara Burung Burung Puyuh. Kanisius, Yogyakarta. Sidabutar. 2009. Pengaruh Frekuensi Inseminasi Buatan Terhadap Daya Tetas

Telur Itik Lokal (Anas Plathyryncho) yang di inseminasi Buatan Semen Entok. Skripsi. Fakultas Pertanian. Universitas Sumatera. Medan.

Sugiharto, R.E. 2005. Meningkatkan Keuntungan Beternak Puyuh. Agromedia Pustaka, Jakarta.

Suprijatna, E.U. Atmomarsono dan R. Kartasudjana. 2005. Ilmu Dasar Ternak Unggas. Penebar Swadaya, Jakarta.

Sutiyono, S.R. dan S. Kismiati. 2006. Fertilitas, Daya Tetas Telur Dari Ayam Petelur Hasil Inseminasi Buatan Menggunakan Semen Ayam Kampung Yang Diencerkan Dengan Berbeda (Skripsi). Fak. Peternakan Universitas Diponegoro. Semarang.