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Research Article

Quail Eggs (*Coturnic coturnic japonica*)'s Fertility, Hatching Power, Hatching Weight, and Saleable DOQ at Quail Farm

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ABSTRACT

This study aims to determine the level of fertility, hatchability, hatching weight, and saleable DOQ of quail eggs (Coturnix coturnix japonica) at puyuh Farm. This study used 16-week-old quails kept in 5 battery cages, in one cage there are 5 levels with a sex ratio of 1:4. Village, Payakumbuh Timur District, Payakumbuh City, West Sumatra. This study used 450 quail eggs which were collected randomly from 5 battery cages, each cage was taken 3 levels for 4 days of collection. This study used a survey method by means of observation and descriptive data analysis. The parameters observed were egg weight, fertility, hatchability, hatching weight and saleable DOQ. The results of this study obtained an average egg weight of 11.25 ± 0.80 g, an average fertility of 85.56 ± 10.13%, an average hatching power of 77.77 ± 12.00%, an average hatching weight of 7.53 ± 0.94 g, and a saleable DOQ of 87.58 ± 9.11%, because there were DOQs with physical defects in the form of deformed and weak legs. The conclusion of this study was that quail eggs at Farm produced standard egg weights, high fertility, high hatching power, standard hatching weights, and high saleable DOQ. However, in the maintenance of seeds at this farm, only female seeds are sold.

Keywords: fertility, hatch weight, hatchability, saleable DOQ

INTRODUCTION

Poultry is one type of livestock that is widely developed in Indonesia. One type of poultry that has great potential to be developed is quail. Quail is one type of poultry that is more often bred to produce eggs and meat. The quail that is currently famous consists of two types, namely wild quail and crossbred or domesticated quail (*Coturnix coturnix japon*ica). Wild quail has low egg production but has the ability to incubate its eggs, while crossbred or domesticated quail has high productivity but does not have the ability to incubate eggs.

Quail eggs produced from crossbreeding or domestication have a high level of productivity, including in terms of size, egg weight, fertility, hatching power, hatching weight and saleable DOQ (Wuryadi, 2014). So that it will have an impact on the production aspect and the aspect of the seeds that will be produced. One effort to improve the quality of quail is to crossbreed the quail parents. This crossbreeding is very good if done by mating two types of quail that have different advantages such as Japanese quail (*Coturnix coturnix japonica*) and hybrid quail (Ajria *et al.*, 2019).

Quail chicks produced from crossbreeding are final stock chicks that already have superior characteristics and high productivity. However, the chicks in circulation often come from

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inbreeding which can cause low quail productivity and a short egg-laying period (Rasyaf, 1995). Quail eggs and meat are obtained from quail farming which continues to grow along with the increasing needs of the community (Handayani *et al.,* 2013). The natural hatching process is less than optimal to meet the needs of the community which are increasing day by day. In the natural hatching process, the mother quail is only able to incubate 5 eggs (Rizki *et al.*, 2018).

Therefore, to produce a lot of quail chicks in a short time, hatching is carried out. Quail egg hatching is a process of embryo development in the egg until it hatches, which aims to get a new individual. The hatching method is divided into two, namely natural hatching (using the mother by incubating) and artificial hatching (using an incubator) the way it works is divided into two, namely automatic and manual. To get good hatching results, besides the maintenance factor, there are other factors such as mating, sex ratio, male age, egg weight, egg turning and egg storage time that must be considered because they will affect fertility, hatchability, hatching weight and saleable DOQ produced.

Lisnawati *et al.* (2020) conducted a study on egg hatching productivity using 125 eggs selected based on the age of the eggs or different storage times. The temperature used in this study was 38°C. The results obtained were a fertility rate of 84.0%, a hatching power of 80.21%, and a hatching weight of 6-8 g. Meanwhile, in a study by Hasanuddin (2017) who conducted a study on fertility, hatching power and hatching weight using different temperatures, a fertility rate of 90.0% was obtained with a temperature of 37°C, a hatching power of 71.52% and a hatching weight of 7.43 g.

Quail farm located in Payobasuang Village, Payakumbuh City. The farm cultivates quail livestock which are female quail from Surabaya, Japanese quail (*Coturnix oturnix japonica*) which are mated with male quail from Payakumbuh. The population of quail on the farm in 2016 was 200. In 2023, there were 2,700, until in 2024 the quail on the farm decreased, the total number of quail kept is now around 1,000 quail. Quails are kept in 5 tiered battery cages, each cage consisted of 5 tiers and each tier was filled with 40-45 quails (8 males and 32 females) with a sex ratio of 1:4. The eggs produced will be sold as consumption eggs and fertile eggs for hatching. After hatching, the chicks will be sold to breeders to be used as laying or meat quails.

The success of the farm in hatching has great potential to develop quail breeding. Because it is able to produce good quality hatching eggs. Quail egg hatching is carried out in a separate location from the quail maintenance farm, quail farm house, which has a special area for hatching quail. There are 5 manual incubators with a capacity of 1200 eggs. The temperature for hatching quail eggs at quail farm ranges from 38-40°C. Under the shelf is placed a tray filled with water to regulate humidity. The humidity for hatching quail eggs ranges from 55-70%.

Temperature and humidity are also important factors in determining the hatchability of quail eggs. And after hatching, it is also necessary to know the saleable quail to determine the quality of the DOQ produced. However, at Quail Farm, the temperature used for hatching is a very high temperature which causes the DOQ produced to have a weak condition and there are some quails with weak legs. In addition, the feed quail Farm affects the fertility rate of quail eggs where the feed given is commercial feed from Charoen Pokhpand.

MATERIAL AND METHODS

This study used 450 quail eggs. Eggs were taken from 5 battery cages, in one battery cage there are 5 levels. In each cage, 3 levels were taken for hatching egg samples, each level of eggs was selected as many as 8-10 eggs/day. So that 15 levels were obtained, in one level 30

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eggs/level were collected for 4 days. The hatched eggs weighed 10-13 g and were in accordance with the criteria for good hatching eggs for hatching.

This research was conducted using observation method with descriptive data analysis by calculating the average and standard deviation. Data were obtained from the results of hatching observations conducted at farm by looking at the weight of hatching eggs used, fertility rate, hatching power, hatching weight and saleable DOQ of quail eggs in each compartment.

Before hatching quail eggs, the incubator was first prepared starting from incubator sanitation using disinfectant, temperature and humidity settings of the incubator. Prepare a tray filled with water, place a hygrometer and digital thermometer in the incubator. The incubator temperature is set to 37.5-40℃ and the humidity is set to 60-70% (Jefrianus *et al*., 2019).

In a study conducted at the Quail farm, the temperature ranged from 38-40°C with a humidity of 5-70%. There were 15 bulbs in the incubator with 3 lights that remain on. A tray filled with 10 water was placed in the incubator. The incubator was given a partition and labeled 1-15. The incubator was turned on 1 hour before the hatching eggs were inserted.

Eggs that are put into the incubator are labeled with numbers and placed horizontally. Then on the fourth day, the eggs are turned or rotated, the eggs are turned 3 times a day, namely in the morning, afternoon and evening. Egg turning is stopped at the age of 15 days of hatching with a horizontal position hatching.

Candling quail eggs in the incubator aims to determine the development of the embryo of the eggs to be hatched. Candling was carried out one week after the eggs were put into the incubator, precisely on the 7th day using a candling tool. Candling was carried out to measure fertility data from quail eggs.

Observed Parameters

The parameters observed in this study include egg weight, fertility, hatchability, hatching weight and saleable DOQ of quail eggs.

1. Egg weight

Egg weight measurement is measured by weighing the eggs using a digital scale (g) before being put into the hatching machine (Lestari *et al*., 2013).

2. Fertility

Fertility is the percentage of fertile eggs from all eggs used so that the eggs can hatch into quail chicks or DOQ, the eggs must be in a fertile state called hatching eggs (Nurhayati *et al*., 2000). Hatching eggs are calculated as a percentage, namely by the formula:

Fertility (%) = number of fertile eggs /number hatchery egg × 100%

3. Hatchability

Hatchability is the percentage of eggs that hatch from the number of fertile embrocated eggs (Lisnawati *et al.,* 2020), calculated by the following formula:

Hatchability (%) = number of eggs that hatch/number of fertile eggs × 100%

4. Hatching weight

Hatching weight measurement is carried out by weighing (g) DOQ when pulling (removing DOQ from the incubator after the feathers are 95% dry) using a digital scale (Lisnawati *et al.*, 2020).

5. Saleable DOQ

Saleable DOQ is a day old quail that is suitable for sale. Saleable is calculated using the formula (Pangestu *et al*., 2021).

Saleable (%) = number of DOQ that are suitable for sale/number of eggs hatched ×100%

Data Analysis

The data analysis used is descriptive statistical analysis by calculating the average and standard deviation (Umar, 2009).

Average calculation: $\bar{x} = \sum Xi\ n$

Description:

$\bar{x}$ = Population average

$\sum$ = Sum

Xi = Value of the i-th observation

n = Number of samples

Standard deviation: $S = \sqrt{n\sum Xi^{\,2} - (\sum Xi)^2\ (n-1)}$

Description:

S = Standard Deviation

$\sum$ = Sum

X = Population Average

Xi = Observation Value to-i n= number of samples

RESULTS AND DISCUSSION

Cage system at Quail Farm

The cage system used at Quail Farm consists of three types of cages used for quail livestock maintenance, namely box cages, grower phase cages and battery cages. Box cages are used for newly hatched day old quail (DOQ) cages, grower phase cages are used for quail aged 10 days to 3 weeks, and battery cages are used for quail that will produce.

In the layer phase maintenance, there are 11 battery cages at Quail Farm. However, currently only 5 battery cages are used. There are 5 levels in one cage. The capacity of one level of battery cage is filled with 40-45 quails with a sex ratio of 1:4. The battery cage has dimensions of 110 cm x 60 cm x 175 cm, with a front slope of 9 cm and a rear slope of 12 cm.

The construction of the cage on the Farm is very good because in each maintenance the cage used is in accordance with the age of the quail. However, it is very unfortunate that the quail farm is that all livestock are mixed in one location. Where chickens, ducks and quails are placed in the same location with adjacent cage buildings. So that there is a risk of disease that can attack quail livestock and decrease the quality of eggs produced.

Quail Chicks

Quail chicks produced on the farm are obtained from hatching carried out by the breeders themselves. The initial chicks raised by the breeders came from mating between a female Japanese quail from Surabaya and a male Japanese quail from Payakumbuh. From this mating, 200 chicks were produced from 1000 eggs hatched. The quail chicks were bred by until their population increased.

The quails raised on the farm number 1000. The male and female quails used as breeders are 4 months old with a male to female sex ratio of 1:4. The mating carried out on the quail farm has produced final stock seeds from the mating of male quails with yellow feathers and female

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quails with black feathers, resulting in male quail chicks with blackish brown feathers and female quail chicks with yellowish brown feathers.

This mating pattern makes it easier for breeders to separate males and females, so that at the age of 1 day old quail (DOQ) male and female quail can be separated based on their morphology, namely from the color of their feathers. Male quails will have a brown color mixed with blacker, while female quails have brown feathers with a yellowish pattern. This is in line with the opinion of Tumbilung (2014) to be able to distinguish one-day-old DOQs can be distinguished based on their morphology through the color of their wing feathers, beaks, and legs (shanks).

The seeds produced from this Farm quail farm are quite good because they come from good parents, good mating, and good handling during hatching. However, the day-old quail (DOQ) produced at the age of 1-3 days are still relatively weak and most have a hatching weight of less than 7 grams. This is because the use of temperature during hatching is too high.

The feed given to quail at the Farm is commercial feed and mixed feed made by the farm itself. The commercial feed given is feed from PT. Charoen Pokhpand Indonesia. Feeding of quail livestock is adjusted to the age of the livestock. For quail in the starter phase, the feed given is in the form of flour or mash with the type of Bravo 311, feed is given ad libitum to quail aged 1 day-30 days. The grower and layer phases of the feed given are commercial feed and mixed feed. The commercial feed given in the grower phase is the type of Bravo 511 and the layer phase is the type P304C in the form of granules or crumble.

In addition to commercial feed, the farm also makes mixed feed for quail in the grower and layer phases. The mixed feed made by the farmer is a mixture of corn, bran, anchovy head flour, minerals, top mix and 511. The feed is combined using a feed machine grinder until all ingredients are evenly mixed. Feed on the farm is usually given twice a day, namely in the morning and afternoon. The amount of feed given is 1-2 scoops/level. In addition to commercial feed and mixed feed, the Farm quail farm also provides maggots to quail as additional protein for quail. The maggots were cultivated by Mr. Jafrisani as additional feed given to livestock and as additional income for farmers to be traded. The maggots given to quail livestock are usually fresh maggots without being processed into flour. The dosage of this maggot is usually 1-2 handfuls of maggots/battery cage level. The feeding at the Farm quail farm is in accordance with the quail maintenance period and in accordance with existing standards. However, giving fresh maggots to quail is not appropriate because the media where the maggots grow is not clean and the food given to the maggots is the carcasses of quail, ducks and chickens. This can result in risks to the health of the quail, because maggots that are given carcass food contain pathogens or fungi that can cause digestive and metabolic disorders in quail.

Quail Maintenance Management on Quail Farms

Maintenance management on the Farm is divided into 3 phases, namely the starter phase, the grower phase and the layer phase. Maintenance in the DOQ starter phase is kept in a box cage until the quail is 10 days old, the temperature in the box cage must be maintained so that the temperature is always stable, because it will affect the growth and development of the quail chicks. The temperature in the cage ranges from 30-35°C. After 10 days old, the quail are moved to the grower phase cage until they are 3 weeks old. The box cage and the grower phase cage have the same shape but have different sizes. Quail that are 2 weeks old are re-selected to ensure male and female chicks. After being separated, the chicks that will be used as parents are

separated from the quail chicks that will be sold. In the grower phase, the quail are left in the grower cage until they are 1 month old.

At the age of 40 days, the quail is moved to the production cage or battery cage. At the age of 40-45 days, the quail has started to lay eggs and will experience an increase in production at the age of 4-6 months. The quail kept at the Farm was 4 months old or 16 weeks old. Daily egg production is 650eggs/day. The maintenance system at the quail farms fairly well because the quail farm pays great attention to the cleanliness of the cage so that the livestock being kept are protected from disease attacks.

Marketing of Quail Farm Results

The results obtained from quail farming on quail farms are consumption eggs, hatching eggs and quail chicks. Consumption eggs are sold by farmers to stalls around the cage or left at stalls until the quail eggs are sold out. In addition, the marketing of quail eggs is also done by buying directly from the Farm. Consumption eggs sold by farmers are in packaged form, where quail eggs are put into plastic boxes. One plastic box contains 12 eggs at a price of Rp. 5,000/box. For hatching eggs in quail farms are not traded but are hatched by the farmers themselves. The results of the hatching produce quail chicks, the quail chicks produced are sold to farmers who will raise quail. Usually, farmers hatch if there is an order or request for chicks to be hatched. The age of quail chicks sold by farmers is 10 days old and the longest is one month old. The price of quail chicks sold by farmers is priced at Rp. 7,000-Rp. 9,000/head for female quail seeds and Rp. 5000/head for male seeds. However, in quail farms only sell female seeds.

Quail Egg Hatching in Quail Farms

Hatching carried out in quail farms is carried out in a different location from the farm. This hatching is carried out at the farmer's house where there is a special room for hatching. During hatching, quail farms pay close attention to the success rate of the hatching. The temperature used during hatching is 38-40°C with a humidity of 55-70%. In this hatching, there are several things that need to be considered such as the sex ratio of mating, the feed given, hatching management and the hatching eggs used. Because the factor will determine the success rate of hatching.

The quails used as laying quails to be hatched on the farm are 16-week-old quails with a total of 1000, with a sex ratio of 1:4 between male and female quails. In this hatching, the incubator used is a manual incubator measuring 150 cm x 80 cm x 75 cm. Inside the incubator, it is equipped with an egg rack and a glass door, in addition, the incubator is equipped with a thermostat as an automatic room temperature regulator, a thermometer to measure the temperature of the incubator and a hygrometer to measure humidity, the heat source comes from 15 bulbs (incandescent lamps) with 3 fixed lamps, the temperature used during hatching is 38-40°C with a humidity of 55-70%, there are 10 trays filled with water to regulate the humidity in the incubator.

The hatching results carried out in quail farms obtained good average fertility, hatchability, hatching weight and saleable values. However, during hatching, the temperature used was too high, resulting in many weak DOQs and deformed legs. In this study, 301 eggs hatched out of 450 eggs hatched, there were 66 infertile eggs, and 83 eggs died during hatching. In the sense that the embryo has formed a quail, but the quail is unable to get out of the shell.

This is because the hatching temperature at 14 days of age reaches 40.1°C and there is low humidity. In this study, the eggs hatched at 15 days of age. At 16 days of age, all eggs had

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hatched; this is due to the handling and use of temperatures during hatching being very high so that the development of the embryo in the egg is very fast. The use of this high temperature greatly affects the day-old quail (DOQ) produced and the hatching weight of DOQ decreased.

Quail Egg Weight in Quail Farms

The weight of quail eggs in quail farms can be seen in Table 1.

Table 1. Average weight, fertility, hatchability, of quail hatching eggs

Box	Egg Weight (g)	Fertility (%)	Hatchability (%)	Hatching Weight (g)	Saleable (%)
1	11.2	77	78.26	7.61	94.44
2	11.3	80	62.50	7.55	80.00
3	11.5	97	75.86	7.32	100.00
4	11.3	93	71.43	6.86	85.00
5	11.2	87	57.69	6.51	66.67
6	11.3	93	71.43	6.48	75.00
7	11.0	73	90.91	7.22	80.00
8	11.3	67	65.00	7.13	92.31
9	10.8	87	76.92	7.29	90.00
10	11.0	70	66.67	7.20	85.71
11	11.1	87	92.31	8.21	91.67
12	11.2	87	88.46	8.19	100.00
13	11.5	93	89.29	7.98	92.00
14	11.6	100	83.33	7.98	92.00
15	11.4	93	96.43	8.24	88.89
Average	11.25	85.56	77.77	7.53	87.58
Sd		10.13	12.00		9.11

In Table 1, it can be seen that the egg weight in quail farms ranges from 10.8-11.6 g with a general average egg weight of 11.25 ± 0.80 g. The average egg weight results in hatching obtained from this study are classified as egg weight sizes that are in accordance with the specified standards. The egg weight used in this hatching weigh between 10-13 g/egg/grain. According to the Directorate of Livestock Breeding (2011) the good hatching egg weight for quail is at least 10 g. Egg weight is selected to obtain uniform DOQ hatching weight results. In addition, this egg weight can affect the fertility of quail eggs. The egg weight in this study was higher than the results of the study by Mahi *et al*. (2012), namely the weight of hatching eggs that were hatched had a weight ranging from 9-10 g, but this study was lower than the results of the study by Parizadian *et al*. (2011), where the average weight of quail hatching eggs was 11.9 g, so the egg weight obtained in this study was said to be good.

In Nuha's research (2017), the weight of good quail eggs for hatching ranges from 10-11 g, to get good seeds, crossbreeding is carried out between pairs of quail. Seeds produced from crossbreeding will be superior compared to seeds from inbreeding. In accordance with Sugiharto's opinion (2005) to get good quality eggs obtained from parents aged 2.5 months, thus quail hatching eggs can be taken when the parents are 2.5-8 months old. Mahi *et al*. (2012) reported the weight of quail hatching eggs has an effect on the sex of the quail. At one day old, quail that hatches, breeders can separate between males and females. Male quail chicks are very rarely kept except for breeding purposes, besides that male quail are very rarely used as meat quail due to the relatively high maintenance costs and inefficiency (Sugiharto, 2005). The weight of hatching eggs will increase along with the age of the quail and will reach a stable peak at the

age of 150 days. The weight produced at the age of 80-150 days ranges from 8-11 g. The weight of hatching eggs that weigh between 8-11 g have a high hatching power, heavier eggs will produce a greater hatching weight compared to small eggs (Abidin, 2003).

Fertility of Quail Eggs in Quail Farms

The fertility of quail eggs in quail farms is seen in Table 1 above. Shows that the fertility of quail eggs in quail farms ranges from 70-100% with an average fertility of 85.56 ± 10.13%. The fertility results of this study are quite high because the fertility percentage for quail poultry is at least 70% (Directorate of Livestock Breeding, 2011). The fertility rate obtained in this study was very high. This is because the parents of the selected hatching eggs came from parents who had undergone purification, so that the eggs produced from the mating had a high fertility rate. The age of the male and the age of the parents on this farm are also very important because they will greatly affect the fertility of the hatching eggs. In addition, the sex ratio of mating used on this farm is 1: 4. So that there is no competition between males and females during mating.

In addition to the sex ratio of mating, feed also plays an important role in determining the fertility rate of these hatching eggs. The quality of the feed given will greatly affect the quality of the quail eggs produced. The results of this study are higher than the research of Kaharuddin and Kasusiyas (2006) the fertility of quail eggs hatched was 77%, but lower than the research of Hasanuddin (2017) the fertility of quail eggs was 90%. In the research of Hasanuddin (2017) the results were higher because the temperature used was 36.1°C - 37.2°C, while in this study a temperature of 38.9°C- 40°C was used. In addition, this fertility rate is influenced by the storage period of quail eggs which has an impact on embryo death before hatching. Fertility is greatly influenced by several factors including the age of the male, the age of the parent, nutrients, sperm motility, temperature, storage period and the percentage of abnormal sperm cells (Novieta, 2021). In line with the opinion of Bell and Weaver (2002), egg fertility is influenced by the age of the male and female, feed, egg age, egg management before entering the incubator and egg management during hatching. Quail eggs obtained from females aged 4-6 weeks to obtain high egg fertility. Egg fertility will decrease according to the increasing age of the parent (Sugiharto, 2005). In the study of Kaharuddin and Kasusiyas (2006) obtained low results due to poor seed quality, this is caused by continuous inbreeding without the use of seeds from outside the area.

While in this study using seeds resulting from mating between female Japanese quail from Surabaya and male Japanese quail from Payakumbuh. According to Sugiharto (2005) inbreeding that is carried out continuously will have impacts such as deformed quail chicks, short production period, imperfect body growth, and producing albino quail, namely white feathers and red eyes. Quail kept in battery cages require the availability of nutritious feed and sufficient drinking needs as well as a predetermined cage area, so the mating process will be easy to do because male and female quail are kept in one cage. High fertility can be obtained depending on the technical aspects when selecting hatching eggs. Selection of hatching eggs includes cleanliness of the shell and shape of the egg, weighing between 10-11 g, smooth shell condition and not storing the eggs for too long (Nuha, 2017).

Hatchability of Quail Eggs at Quail Farms

The hatchability of quail eggs at Jafrisani Farm can be seen in Table 1. Table 1 shows that the hatching rate of quail eggs in quail farms ranges from 57.69-96.43% with an average of 77.77±12.00%. The hatching results carried out on this farm obtained a fairly high hatching rate.

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This is due to the ratio between males and females used. The resulting hatching rate can be influenced by the length and temperature of egg storage, fertility, age of the parent and handling during hatching. The storage period for hatching eggs in this hatching is 4 days. The temperature and humidity used in this hatching are 38-40°C with a humidity of 55-70%.

The results of this study are lower than the results of the study by Novieta *et al.* (2021) which found that the hatching power of quail eggs was 86.67%. Lukman *et al.* (2020) stated that the factors that affect the hatching power of quail eggs are feed, egg shape, egg weight, egg interior quality, egg exterior quality or eggshell, disease and egg handling. In addition, hatching power and egg quality are also influenced by several other factors such as egg storage, storage temperature, egg storage time, temperature in the incubator, environmental temperature, humidity and egg turning during hatching (Sutiyono *et al.,* 2006). Short egg ages have high quality because the eggs are still fresh. According to Meliyanti *et al*. (2012), a good egg age for hatching is no more than 7 days because it will cause the hatching power of quail eggs to decrease compared to hatching eggs that are 1-3 days old, fresh eggs. Fresh eggs have good quality compared to old eggs. Fresh eggs have thick and thick egg white conditions with egg yolks in the middle. Egg white and egg yolk have a very important role and contain nutrients that are useful for the development of the embryo in the egg (Novieta *et al.,* 2021).

According to Abidin (2003) to obtain quality hatching eggs, it is necessary to conduct egg selection with good hatching egg criteria, eggs are obtained from parents aged between 80-150 days to obtain high hatching power. Hatchling power at the age of 80-150 days is higher compared to the age of parents that are below 80 days or above 150 days.

In this study, the quail used were 4 months or 16 weeks old, the average weight of the eggs used was 11.25 g, the eggs used were collected for 4 days. According to Kurtini and Riyanti (2003) eggs with average or medium weight will hatch better than eggs that are too small and too large. Egg weight, shell thickness, sex ratio, temperature and humidity are closely related to fertility and hatching power.

Hatch Weight of Quail Eggs in Farms

The hatch weight of quail eggs in quail farms can be seen in Table 1. Table 1 show that the hatching weight of quail eggs ranges from 6.48-8.24 g with a general average hatching weight of 7.53 ± 0.94 g/head. The hatching weight results obtained in this study are fairly good. This is because the egg weight used is between 10-13 g, this egg weight has a correlation with the DOQ hatching weight produced. Apart from the hatching weight, the length of egg storage can also affect the hatching weight produced. Where in the storage of hatching eggs in this study were stored for 4 days. The hatching weight obtained decreased because the temperature used in this hatching was quite high, namely the hatching temperature of 38-40°C.

However, the results of this study are higher than the results of Dualolo's (2017) which obtained a hatching weight of 7.24 g/head. This is due to the different egg weights and handling carried out during hatching. According to Science (2011) states that eggs have main components, where each component has its own advantages. The eggshell functions as a protector for the embryo from external disturbances such as bacteria from dirt that sticks to the eggshell. In addition, the eggshell also functions to protect the egg white and egg yolk so that they remain in their position and protect them from harmful substances.

According to Mahi (2012) to get a good hatching weight, an egg weight of between 9-10 g is required. Bucher *et al.* (2004) stated that in addition to affecting the hatching power of quail, egg weight also affects the hatching weight of quail eggs, high egg weight will produce high hatching

weight and vice versa. According to Neonnub *et al.* (2019) incubation temperature or specific embryo is an important factor that influences the hatching results or day-old quail (DOQ). Factors that affect embryo temperature are embryo heat production, air temperature in the incubator, humidity and air flow rate.

In this study, the temperature used in quail farming ranged from 38-40°C with humidity of 55-70%. Popescu and Miclosanu (2007) stated that the temperature used in hatching quail eggs still varies greatly from 37.5 to 40°C. Good temperature control for quail hatching is between 37°C and 38°C. In general, the highest incubation temperature is 40°C. Very high incubation temperatures will result in decreased hatching weight, while lower incubation temperatures will result in low hatching power and hatching weight (Romao *et al.,* 2008).

Saleable DOQ Quail Eggs in Quail Farm

Saleable DOQ quail eggs in quail farm can be seen. Table 1 shows that research on the saleable level in quail farms ranges from 66.67-100% and produces an average of 87.58 ± 9.11%. The saleable DOQ obtained is very high. The success factor in hatching can be seen from the high hatchability and saleable DOQ. Saleable DOQ is one of the benchmarks for success in hatching and breeding quail livestock, the higher the percentage of Saleable DOQ, the higher the opportunity to make a profit. In this study, the Saleable DOQ level obtained was very high, but the saleable DOQ results in each compartment were different because the hatchability results of each compartment were different, because this saleable is the number of DOQ that is worth selling from the number of DOQ that hatch. In this hatching, an average saleable of 87.58% was obtained from the 77.77% hatchability produced. Of the 301 eggs that hatched, there were 266 quails that were worth selling. Which consists of 142 females and 124 males. DOQ that hatch at the age of one day are immediately separated between males and females, in this study the ratio of the number of males and females was 45:55 where males numbered 136, and females numbered 165 from a total of 301 quail eggs that hatched. DOQ that are male can be seen from the color of the feathers so that at the age of one day the DOQ that hatch can be selected between males and females, so that it can make it easier for farmers to minimize the cost of using feed (Sugiharto, 2005).

Prasetyo and Susanti (2000) stated that what affects the results of hatching eggs is the incubator machine equipment in creating what environmental conditions are like, one of which is humidity and temperature in accordance with the rules for carrying out hatching, environmental factors beyond the manager's ability such as changes in electrical voltage or power outages. The hatching carried out at quail farm was without treatment, so the saleable results produced were lower than the research by Rahmdani (2022) in this study using natural antiseptics to clean quail egg shells from contamination of bacterial colonies in the egg shells. . Pangestu *et al*. (2021) stated that hatching without treatment got low saleable, not reaching 100%, this is suspected of being defective or contaminated with bacteria.

According to the Ministry of Agriculture (2014), there are several requirements for good DOQ quality, namely coming from quail parents who have the ability to lay eggs between 300-310/head/year, coming from parents who produce eggs weighing between 10-12g/egg, DOQ weight between 7-8g, healthy physical condition, normal legs and can stand upright, looks fresh and active, and has no defects on its body, as well as uniform feather color and dry feather condition and a mortality rate of 2%.

Sales of DOQ seeds at Quail Farms, the seeds sold are only female. While male quails are not used so that male quails are thrown away or used as food for maggots and catfish, but it is

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possible that all male seeds are given to maggots or catfish, some quails are used as males for breeding and used as males. Female quail seeds are sold after DOQ is 10 days old and a maximum of one month old; the price range for seeds sold is IDR 7,000 - IDR 9,000/head. The seeds sold are laying quail and quail for brood stock. In the hatching carried out during this period, DOQs that are kept for sale are only female quail, the number of females that are suitable for sale is 142 female quail. Marketing of DOQ is marketed to breeders who have made orders in advance.

CONCLUSION

The results of the research conducted, it can be concluded that the hatching rate of quail in quail farms obtained an average egg weight of 11.25 ± 0.80 g, fertility 85.56 ± 10.13%, hatchability 77.77 ± 12.00%, hatching weight 7.53 ± 0.94 g, and saleable DOQ of 87.58 ± 9.11%, because there are DOQs that have physical defects in the form of deformed and weak legs. However, in the maintenance of seeds on this farm, only female seeds are sold.

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REFERENCES

Abidin, Z. (2003). Meningkatkan produktivitas puyuh si kecil yang penuh potensi. Agomedia Pustaka.

Ajria, H., Latif, H., & Yaman, M. A. (2019). Pengaruh perbedaan rasio indukan puyuh jantan hybrid dan puyuh betina Jepang (*Coturnix coturnix japonica*) terhadap kualitas DOQ. *Jurnal Ilmiah Pertanian Unsyiah, 4*(1).

Bell, D., & Weaver. (2002). *Commercial chicken meat and egg*. Kluwer Academic Publisher.

Bucher, D. G., & Miles, R. D. (2004). Egg specific gravity: Designing a monitoring program. University of Florida.

Direktorat Pembibitan Ternak. (2011). Pedoman pembibitan burung puyuh yang baik (Good Breeding Practice). Direktorat Jenderal Peternakan dan Kesehatan Hewan, Departemen Pertanian.

Dualolo, R. Y. (2017). Fertilitas, daya tetas, dan berat tetas telur burung puyuh pada berat telur yang berbeda (*Skripsi*). Universitas Hasanuddin.

Handayani, I., Tana, S., & Saraswati, T. R. (2013). Panjang dan bobot saluran reproduksi puyuh betina (*Coturnix coturnix japonica*) setelah pemberian tepung kunyit (*Curcuma longa* L.). *Jurnal Akademika Biologi, 2*(3), 17–24.

Hasanuddin, A. (2017). Pengaruh suhu penetasan terhadap fertilitas, daya tetas, dan berat tetas telur burung puyuh (*Skripsi*). Universitas Hasanuddin.

Jefrianus, N., Lovita, A., & Iwan, S. (2019). Pengaruh level suhu mesin tetas terhadap daya tetas dan bobot tetas puyuh Padjadjaran. *Jurnal Ilmu Ternak*.

Kaharuddin, D., & Kususiyah. (2006). Performans sifat kualitatif dan kuantitatif puyuh asal Yogyakarta, Padang, dan Bengkulu. *Jurnal Peternakan, 9*(1), 1–10.

Kurtini, T., & Riyanti, R. (2003). Teknologi penetasan. Universitas Lampung.

Lestari, E., Ismoyowati, & Sukardi. (2013). Korelasi antara bobot telur dengan bobot tetas dan perbedaan susut bobot pada telur entok (*Cairina moscata*) dan itik (*Anas platyrynchos*). *Jurnal Ilmiah Peternakan, 1*(1), 163–169.

Lisnawati, L., Naflu, O., & Slamet, A. (2020). Fertilitas, daya tetas, dan bobot tetas telur puyuh (*Coturnix coturnix japonica*) dengan lama penyimpanan yang berbeda. *Jurnal Ilmiah Peternakan Halu Oleo, 2*(3), 238–243.

Lukman, B., Syamsuryadi, & Mutmainna, I. (2020). Frekuensi pemutaran telur terhadap nilai mortalitas, daya tetas, dan bobot telur burung puyuh. *Jurnal Agrominasa, 5*(1), 89–97.

Lystiowati, E., & Roospitasari, K. (2009). Beternak puyuh secara komersial. Penebar Swadaya.

Mahi, M., Achmanu, & Muharlien. (2012). Pengaruh bentuk telur dan bobot telur terhadap jenis kelamin, bobot tetas, dan lama tetas burung puyuh (*Coturnix coturnix japonica*). Universitas Brawijaya.

Meliyanti, N., Nova, K., & Septinov, D. (2012). Pengaruh umur telur tetas itik Mojosari dengan penetasan kombinasi terhadap fertilitas dan daya tetas. *Jurnal Ilmiah Peternakan Terpadu, 1*(1), 1–9.

Natsir, W. N. I., Rahayu, R. S., Daruslam, M. A., & Azhar, M. (2020). Palatabilitas maggot sebagai pakan sumber protein untuk ternak unggas. *Jurnal Agrisisem, 16*(1).

Nugraha, F. M., Somanjaya, R., & Widianingrum, D. (2016). Performa telur tetas burung puyuh Jepang (*Coturnix coturnix japonica*) berdasarkan perbedaan bobot telur. Universitas Majalengka.

Nuha, U. (2017). Kiat sukses beternak burung puyuh. Zahara Pustaka.

Pangestu, A., Nova, K., Septinova, D., & Riyanti. (2021). Pengaruh penggunaan ekstrak daun jambu biji (*Psidium guajava* L.) terhadap mortalitas embrio, daya tetas, dan saleable itik hibrida. *Jurnal Riset dan Inovasi Peternakan, 5*(2), 88–93.

Parizadian, B., Ahangari, M. S., Shargh, A., & Sardarzadeh. (2011). Effect of different levels of L-carnitine supplementation on egg quality and blood parameters of laying Japanese quail. *Journal of Poultry Science, 10*, 621–625.

Popescu, E., & Miclosanu. (2007). Cresterea pasarilor pentru production de oua. Ed Printech.

Prasetyo, L. H., & Susanti, T. (2000). Persilangan timbal balik antara itik alabio dan mojosari periode awal bertelur. *Jurnal Ilmu Ternak dan Veteriner, 5*(4), 210–213.

Rahmdani, D. (2022). Pengaruh penggunaan berbagai antiseptik alami terhadap total koloni bakteri kerabang telur, daya tetas, mortalitas embrio, dan saleable DOQ pada penetasan telur burung puyuh (*Coturnix coturnix japonica*) (*Skripsi*). Universitas Andalas.

Rasyaf, M. (1995). Pengelolaan usaha peternakan ayam pedaging. PT Swadya.

Romao, J. M., Moraes, T. G. V., Teixeira, R. S. C., Cardoso, W. M., & Buxade, C. C. (2008). Pengaruh lama daya tetas dan penurunan berat badan pada inkubasi telur dan daging burung puyuh Jepang. *Brazilian Journal of Poultry Science, 10*, 143–147.

Science. (2011). Karakteristik fisik dan kimia telur ayam arab pada dua peternakan di Kabupaten Tulungagung, Jawa Timur. Retrieved from http://repository.ipb.ac.id/handle/123456789/47642

Sugiharto, E. R. (2005). Meningkatkan keuntungan beternak puyuh. Agromedia Pustaka.

Sutiyono, Riyadi, S., & Kismiati, S. (2006). Fertilitas dan daya tetas telur dari ayam petelur hasil inseminasi buatan menggunakan semen ayam kampung yang diencerkan dengan bahan yang berbeda. Universitas Diponegoro.

Umar, H. (2009). Metode penelitian untuk skripsi dan tesis bisnis. Rajawali Persada.

Wuryadi, S. (2011). Buku pintar beternak dan bisnis puyuh. Agromedia Pustaka.

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