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Performance Production Based on the Type of Mating in Local Ducks

DP Candrasari[1]*, D Purwantini[1], S A Santosa[1], A Susanto[1], and Harwanto[2]

[1]Department of breeding and applied animal science, Faculty of Animal Science, Jenderal Soedirman University, Purwokerto, Indonesia
[2]Department of Nutrition of Animal Science Faculty of Animal Science, Jenderal Soedirman University, Purwokerto, Indonesia

ORCID
http://orcid.org/0000-0003-3241-231X

Abstract.
This study aims to determine the effects of the local duck mating patterns (Tegal and Magelang) on production performance based on feed consumption, feed conversion (FCR), and egg production (DDP). The research used 80 Magelang and Tegal ducks. The research is an experimental study with a completely randomized design (CRD). The research used 4 treatments and 5 replications. The number of ducks in each cross consisted of 5 (five) males and 15 (fifteen) females. P1 crossed Magelang and Magelang ducks (MM), P2 Magelang Tegal (MT), P3 Tegal Magelang (TM), and P4 Tegal and Tegal (TT) which were given the same feed in the form of concentrate feed. Ducks were kept for 3 months to observe their production performance. The results showed that there was no significant difference between the feed consumption of P1 and P3, but significantly different (P> 0.05) between P2 and P4. The highest egg production was produced by P3 followed by P1, P2, and P4, while the lowest FCR is P2 followed by P4, P3 and the highest was P1 (MM). From the research, it was concluded that the Tegal-Magelang (P3) duck crossbred had the best productivity and the most efficient use of feed compared to other cross treatments.

Keywords: Duck cross breeding, Local Ducks, Egg production, Feed Consumption, FCR.

Corresponding Author: DP Candrasari; email: dewipus-pita.chandra@unsoed.ac.id

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1. Introduction

Ducks in Indonesia have considerable potential to be developed and can be expected to provide food sources of protein. Local ducks that are well known among the Indonesian people are Tegal ducks, Bali ducks, Mojosari ducks, Magelang ducks[1]. According to [2], local ducks as Indonesian germplasm are classified as Indian runner ducks, namely ducks that produce eggs. In general, ducks are kept for their eggs or meat as a source of animal protein. [3] stated that Tegal ducks have physical characteristics that resemble Indian Runner ducks with an upright, slender, bottle-like body, shape and, high egg production. Tegal ducks are classified as laying ducks. According to [4] productivity of Tegal ducks is 225 ± 27,386 eggs/year.

Magelang ducks according to [5] is a native local Indonesian duck, precisely in Magelang Regency, Central Java Province. Good immunity is one of the advantages of Magelang ducks so that they can be developed in other areas. The maintenance of Magelang ducks as laying ducks is due to their high production. According to [4] Magelang ducks have egg productivity 290 ± 4,438 eggs/year. According to [6], Magelang ducks with an average population of 152.70 ± 31.62 individuals can produce 75.44% eggs with a weight of 66.15 g.

[7] state that crossing is to avoid inbreeding, increases heterosis and brings out complementary traits. Crosses between Tegal and Magelang ducks are carried out to improve genetic quality, especially to improve the production characteristics of this livestock. Qualitative traits (coat color, claw shape, beak, body shape) and quantitative (age at first egg production, egg weight, hatch weight) can be improved by genetic improvement. According to [2], genetic factors affect the development of the ovum and the ability of the ovum to ovulate the yolk.

Production performance is a factor used to measure the quality of livestock in terms of body weight gain, feed consumption, feed conversion and total egg production. Calculation of body weight gain is done by subtracting the results from weighing the final body weight from the initial body weight. Feed consumption is calculated from the amount of feed given minus the remaining feed, for feed conversion it is calculated from the amount of feed consumed divided by body weight gain. This study aims to determine the different types of mating types of local ducks that are kept in breeders on egg productivity. The benefit of this research is to provide information on how the type of mating type of local ducks reared at the farmer has on egg production, feed consumption and feed conversion

2. Materials and Methods

The research material consisted of 80 Magelang and Tegal ducks divided into 4 (four) types of crosses (P1, P2, P3, P4). The number of ducks in each cross consists of 5 (five) males and 15 (fifteen) females. This research uses experimental methods with completely randomized design (CRD). There were 4 treatments and 5 units of replication. Each replication unit consisted of 3 female ducks and 1 male duck. The treatments are as follows:

P1 = cross of Magelang male ducks (M) and Magelang females (M)

P2 = cross of Magelang (M) and Tegal (T) female ducks

P3 = cross of Tegal male duck (T) and Magelang female (M)

P4 = cross of Tegal male ducks (T) and Tegal females (T)

The parameters measured in this study were feed consumption, egg production, feed conversion. Measurement of feed consumption and egg production were carried out every day from the start of maintenance until 40 days by direct observation in the field.

Parameter measurement is done by:

1. Feed consumption

Feeding (g) - Leftover Feed (g)

2. Egg Production is calculated in DDP (Duck Day Production)

DDP= $\frac{number\ of\ eggs}{number\ of\ eggs}$ x 100%

3. Feed Conversion (FCR)

FCR = $\frac{feed\ consumption\ (g)}{egg\ weight\ (g)}$

The data obtained were processed using the Analysis of Variant (ANOVA) to determine whether there were differences between the treatments given, then continued with the HSD test.

3. Results and Discussion

The feed given to all ducks contained in the treatment was the same in composition. The composition of the feed uses available feed ingredients, namely corn, concentrate, bran, and dry rice (aking). The composition of the feed ingredients for the ration showed in the Table. 1.

Table 1: Duck Feed Formula and Proximate Analysis.

Ingredient	(%)
Yellow corn	20.00
Concentrate	20.00
Rice bran	50.00
Dried rice	10.00
Total	100.00
Nutrient content*	
Moisture Ash Crude protein (CP) Ether extract (EE) Crude fiber (CF) Metabolic energy (ME)	10.64 11.49 12.04 13.39 22.84 2,876.00 kkal

Results analysis Laboratory of Animal Nutrition, Faculty of Animal Science Unsoed

Based on the Table. 1, it was found that the energy demand for ducks was fulfilled from that given, namely 2876 kcal according to [8] which states that the energy demand

for layer phase ducks is 2700 kcal. Protein given to laying ducks is still lacking, only 12.04%. [9] stated that the feed for laying ducks must have a CP of 17-19%.

Table 2: Feed intake, ration conversion and DDP.

	Treatment			
	P1	P2	P3	P4
Feed intake (gram)	172 ± 2.47^{a}	141 ± 3.03^{b}	171.33 ± 3.61^{a}	152 ± 5.08^{b}
Egg production (%)	46.98 ± 0.002^{b}	44.13 ± 0.04^{c}	50.79 ± 0.02^{a}	33.33 ± 0.08^{d}
Feed conversion	2.54 ± 0.005^{a}	2.06 ± 0.01^{c}	2.36 ± 0.003^{b}	2.23 ± 0.01^{d}

**The numbers followed by the same letter are not significantly different in the HSD 5%*

The mean feed consumption, feed conversion, and egg production of several cross-breeds of ducks are presented in Table 2. The results of the analysis showed that there was no significant difference in Magelang duck P1 and P3 treatments. Magelang ducks were seen consuming 171.33 ± 3.61-172 ± 2.47 grams/day of feed. Tegal ducks in P2 and P4 treatment consumed less feed than Magelang ducks, namely 141 ± 3.03-152 ± 5,08 grams/day. Different feed consumption in treatment can be caused by various factors, including environmental factors, palatability, and type of feed. Whereas in P2 and P4 the consumption is below P1 and P3 not the same with the opinion of [10] which states that Tegal ducks consume 160 grams of feed per day. [11] stated that the need for adult laying ducks> 20 weeks requires a feed of 160 - 180g/head /day. The low feed consumption of Tegal ducks is thought to be due to their genetics and sufficient energy requirements. In line with the research of [12] who reported that ration consumption in ducks were influenced by energy requirements and energy content in the ration. If energy needs fulfilled, the consumption will be a little. Than, [12] explained that the energy content of rations, ration consumption was also influenced by differences in species, types, age of livestock, growth speed, crop capacity, feed texture, crude fiber, and anti-nutritional properties.

Egg production is influenced by several factors, one of which is feed consumption, it is necessary to provide adequate nutrition in the ration so that feed consumption is sufficient [13]. Based on (table. 2) indicated that duck egg production at 3 weeks of production was significantly different (P> 0.05). The highest production was in the Tegal and Magelang duck group (P3) 50.79 ± 0.02 followed by P1 46.98 ± 0.002, P2 44.13 ± 0.04, and finally P4 33.33 ± 0.08. This production rate is different from research by [14] and [9] which states that duck egg production is 55.6% - 58% equivalent to 203 eggs/head/year. This difference is thought to be caused by the feed adequacy factor. The results showed that the higher feed consumption in each treatment was also followed by an increase in egg production in accordance with the research of [15]

on Mojosari ducks. In treatment 3 and 1, which consumed a lot of feed, it was seen that they had a greater egg production than treatment P2 and P4. According to the opinion of [17] which states that the amount of feeding ducks also affects duck egg production. Ducks are unable to produce eggs if the amount of feed consumed does not meet their production needs. [16] research strengthens the results of the study that the level of feed consumption of ducks will affect the weight of duck eggs, the higher the feed consumption, the heavier the duck eggs. Other factors that affect egg weight are genetics, feed, age, type of livestock, season changes when livestock lay eggs, and the body weights of the livestock [18].

The low egg production compared to other studies is thought to be due to cages that are too narrow and dense which causes stress on the ducks. This is in line with the opinion of [16] which explains that population density in a cage can affect the growth and production of duck eggs. The condition of the cage that is too narrow can result in a decrease in oxygen levels and an increase in the accumulation of carbon dioxide in the cage which can cause slow growth, low egg production, and increased mortality because ducks are susceptible to disease. Research by [16] added that the denser the duck cage, the more likely it is to increase drinking water consumption because the ducks feel congested (hot) due to ammonia in the cage at night, causing disruption of body metabolism and reducing egg production. The less suspected protein content is another factor that causes egg production to be less than optimal, according to the opinion of [19] which states that if the protein is not sufficient for basic living, the production is not optimal. According to the opinion of [20] the protein content in feed was 19.86% a can meet the nutritional needs of ducks so that the maximum productivity and egg weight was obtained.

The results showed that the Feed Conversion Ratio (FCR) value of the ducks in the Magelang-Tegal cross (P2) was 2.06 $\pm$ 0.01 lower than the other crosses. The highest FCR was at the Magelang-Magelang (P1) cross 2.54 $\pm$ 0.005 followed by P3 2.36 $\pm$ 0.003 and finally P4 2.23 $\pm$ 0.01. However, the FCR of the four crosses is still at normal limits, this is following the opinion of [9] which states that the use of rations is more efficient if the FCR value is getting smaller, and it is said to be bad if the FCR value reaches 3.2 - 5. Although the smallest FCR does not mean P4 is the most efficient, it can be seen from egg production which is at least. Another factor that affects FCR is feed consumption, which is shown in Table. 2 P4 feed consumption is also low. [21] stated that the rate of ration conversion is highly dependent on the consumption of rations spent at a certain time. Ration conversion is influenced by genetics, body size, environmental temperature, health, adequate dietary nutrients, number, and weight of

eggs produced [22]. In this study presented in Table 2, it can be seen that (P3) the Tegal-Magelang duck crossing is efficient in feed use in terms of feed consumption and egg production followed by P1 and P2. The higher the feed conversion rate, the more inefficient the ration is consumed in producing egg production, conversely the lower the feed conversion rate the more efficient the ration used in producing egg production [15]. Apart from being influenced by ration consumption, ration conversion is also influenced by maintenance management and the health status of the livestock. [12] explained that the size of the ration conversion rate obtained was influenced by several factors, including genetics, sanitation, type of ration, and maintenance management.

4. Conclusions

Based on the results of the study, it can be concluded that the Tegal-Magelang duck cross (P3) is the most efficient in the use of feed and productivity is the best compared to other crosses.

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