

# Performance of various types of West Sumatera female ducks at starter period

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**Abstract.** West Sumatera has several breeds of germplasm ducks that have good potential for breeding, including Bayang Ducks, Kamang ducks, Pitalah ducks, and Sikumbang Janti ducks. This type of duck develops in the origin area to produce eggs and meat. The diversity of the performance of these ducks is still high. This study aims to determine the performance of various West Sumatera female ducks during the starter period. One hundred twenty heads of local female ducks were used in this study. This study used an experimental method of Completely Randomized Design (CRD) with four treatments and five replicates; each cage unit consisted of 6 ducks. The treatments in this study consisted of four breeds of local female ducks from West Sumatera, namely A (Bayang duck), B (Kamang duck), C (Pitalah duck), and D (Sikumbang Janti ducks). This study showed that four breeds of local female ducks in West Sumatera had no significant effect ( $P>0.05$ ) on feed consumption and body weight gain. In comparison, four breeds of local female ducks in West Sumatera significantly affected feed conversion ( $P<0.05$ ). The feed conversion for Bayang, Sikumbang janti, Kamang, and Pitalah ducks was 4.60, 4.89, 4.60, 4.38, and 4.29. Based on the feed conversion, female Pitalah ducks were more efficient than others.

## 1 Introduction

The potential of ducks in Indonesia is enormous, especially as a producer of meat and eggs. Duck also has the potential to be developed because it has relatively good adaptability and has many advantages compared to other poultry, including ducks being more resistant to disease. In addition, ducks have efficiency in converting feed into good meat [1].

Based on data from the Directorate General Animal Husbandry and Health obtained data on the population of ducks in Indonesia in 2021, as many as 50,311,991 heads while West Sumatera 1,185,955 heads (2). West Sumatera has several breeds of germplasm ducks that have good breeding potential. The ducks are named according to the name of the local area, such as Kamang duck, Bayang duck, Payakumbuh (Sikumbang Janti) duck, and Kamang duck [1-3].

Kamang duck is one of the local Indonesian duck families, which has an original geographic distribution in the province of West Sumatera in the Tيلاتang Kamang area. Kamang ducks have different characteristics from native ducks or other local ducks and are

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germplasm of local Indonesian livestock that needs to be preserved. According to Arlina et al. [3], the qualitative characteristic of Kamang duck is that the fur color tends to be brown with a black beak and is characterized by a curved white line above the eyes, and some have a white circle around the neck like a ring. Kamang duck is one of the local breeds with good prospects in meat production in West Sumatra [1, 3]. While Pitalah duck comes from Batipuh District, Tanah Datar Regency. Pitalah ducks are germplasm of ducks in West Sumatra Province which in 2011 was designated by the Ministry of Agriculture as a national livestock family Decree of the Minister of Agriculture number: 2923/Kpts/OT.140/6/2011 [4].

The Bayang duck is one of Indonesia's local ducks originating from Bayang District, Pesisir Selatan Regency, West Sumatra Province in 2012 by the Ministry of Agriculture as a national livestock family based on the Decree of the Minister of Agriculture number 2835/Kpts/LB.430/8/2012 [5]. The Bayang duck has the potential to be developed as a producer of meat and eggs. The quality and quantity of meat and eggs produced make Bayang ducks favored by livestock farmers to be kept. In addition, developing germplasm as a regional characteristic is an important step that needs attention [6].

The Sikumbang Jonti duck has a relatively uniform coat color. The results of Arlina et al. [7], the male Sikumbang Jonti duck has a head coat color that is dominated by white-black (70%), the color of the neck feathers is dominated by white-black (60%), the color of the chest hair is dominated by white (64%), the color of the back feathers is dominated by color. White-black (60%), the color of the primary wing feathers is dominated by green (64%), the color of the tail feathers is dominated by white-black (62%), and the color of the thigh feathers is dominated by white (100%).

Female ducks are kept as eggs and males as meat. Due to the quality and quantity of meat and egg produced, breeders favor ducks to be kept. Various breeds of local female ducks in West Sumatra allow duck breeders to choose the type of duck to be kept as egg producers. The performance of ducks during growth also influences duck egg production. The growth of female ducks at the beginning of the starter period also determines the level of egg production that will be optimal [1].

## 2 Materials and methods

### 2.1 Research materials

Four female local duck breeds in West Sumatra were used in this study, with a total of 120 female ducks consisting of 30 Bayang ducks, 30 Kamang ducks, 30 Pitalah ducks, and 30 Sikumbang Janti ducks. They were reared from four days to ten weeks old during the starter period. The cages used in this study were twenty colony cages measuring 75 x 60 x 50 cm<sup>2</sup>. Each cage unit contains six ducks equipped with a place to eat and drink, and a heat source is a 60-watt lamp/unit. The tools used consist of scales and stationery.

The feed used in this study was commercial feed Bravo 511 and Vivo 512 from PT. Charoen Pokphand Indonesia. Bravo 511 feed was given to ducks aged 0-4 weeks, and Vivo 512 feed was given to those aged 4-8 weeks.

### 2.2 Research methods

The research method used in this study was an experimental method using a Completely Randomized Design (CRD) consisting of four treatments and five replications. Each experimental unit consisted of six ducks. Four West Sumatra female ducks were used as a treatment: A. Bayang ducks, B. Kamang Ducks, C. Pitalah Ducks, and D. Sikumbang Janti Ducks.

## 2.3 Research variables

The variables measured in this study are as follows:

- Ration consumption = Total feed consumed/day - Leftover feed/day(g/duck)
- Body weight gain = initial body weight/week - Finalbody weight/week (g/duck)
- Feed Conversion (FCR) =  $\frac{\text{Total Feed Consumption (kg)}}{\text{Body weight Gain (kg)}}$

## 2.4 Statistical analysis

The data obtained were processed using a Completely Randomized Design (CRD) with the SAS (Statistical Analysis System) application.

## 3 Results and discussion

### 3.1 Ration consumption

The average ration consumption of four breeds of West Sumatra female ducks during the starter period of the research can be seen in Table 1.

**Table 1.** Average ration consumption of four breeds of West Sumatra female ducks during the study (g/head/week).

Treatment	Ration consumption (g/head/week)
A	493.25
B	491.41
C	462.83
D	488.08

Description: The treatment showed no significant results ( $P>0,05$ ). A = Bayang duck, B = Kamang duck, C = Pitalah duck, and D = Sikumbang Janti duck.

Based on Table 1, the consumption of four West Sumatra female ducks in the starter phase with each treatment was A of 493.25 grams/head/week, B of 491.41 grams/head/week, C of 462.83 grams/head /week, and D of 488.08 grams/head/week. The analysis of variance showed that four breeds of local female ducks from West Sumatra in the starter phase, which were kept for eight weeks, had no significant effect ( $P>0.05$ ) on ration consumption. The influence of various types of West Sumatera Female Ducks on the ration consumption was not significant. It caused the energy content of the rations given to be the same, and the research was carried out in an area with a comfortable temperature for ducks. Williamson [8] stated that feed consumption will increase at low ambient temperatures and vice versa; feed consumption will decrease if the ambient temperature is high. By the opinion of Amrullah [9], two factors affect the daily consumption of feed, namely the calorie content of the ration and the ambient temperature. Wilson et al. [10] states that the comfortable temperature for ducks is 18.3-25.5°C.

In this study, four breeds of local female ducks from West Sumatra came from different habitats, where the Bayang duck came from an area with an altitude of 2 -20 meters above sea level. The Sikumbang Janti duck came from an area with an altitude of 514 meters above sea level, while the Pitalah duck came from 600 meters above sea level. Kamang ducks come from an area with an altitude of 850 m above sea level. The four breeds of ducks are kept in

an area with an altitude of 700 -800 m above sea level with an average ambient temperature of 25°C according to the temperature at the time of the study. The temperature in this study included a comfortable temperature for ducks, so the ration consumption of four breeds of local female ducks from West Sumatra in the starter phase had no significant effect.

### 3.2 Body weight gain

The average body weight gain of four breeds of West Sumatra local female ducks in the starter period during the study can be seen in Table 2.

**Table 2.** Average body weight gain of four breeds of West Sumatra female ducks during the study (g/head/week).

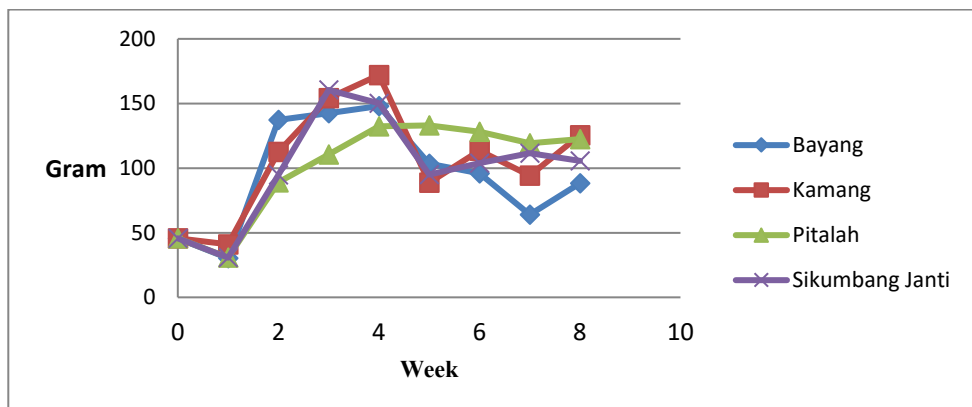
Treatment	Body weight gain (g/head/week)
A	101.23
B	112.69
C	108.21
D	106.53

Description: The treatment showed no significant results ( $P>0,05$ ). A = Bayang duck, B = Kamang duck, C = Pitalah duck, and D = Sikumbang Janti duck.

Based on Table, the body weight gain of local West Sumatran female ducks at the starter period with each treatment was A of 101.23 g/head/week, B of 112.69 g/head/week, C of 108.21 g/head /week and D of 106.53 g/head/week. The analysis of variance showed no significant effect on the body weight gain of local West Sumatran female ducks in the starter phase ( $P>0.05$ ).

The body weight gain of four breeds of West Sumatra female ducks in the starter period was relatively the same, presumably because the amount of ration consumption and the type of ration given were the same. According to Rafian [11], livestock that consumes rations containing the same nutrients will show almost the same body weight gain. This statement follows the opinion of Alyandari et al. [12] and Tillman et al. [13], which state that body weight gain is closely related to ration consumption; the higher the ration consumption

For more details, the body weight gain of four breeds of West Sumatra female ducks during the starter period is presented in Figure 1.



**Fig. 1.** Body weight gain of four breeds of West Sumatra female ducks.

Figure shows a graph of the body weight gain of West Sumatra female ducks during the starter period. The highest body weight gain in Bayang ducks occurred in the fourth week at 148.00 g, and the Kamang ducks occurred in the fourth week at 172.00 g, while in Pitalah ducks, it occurred in the fifth week at 133.03 g and the highest body weight gain in Sikumbang Janti ducks occurred in the third week of 160.47 g. [14] explained that the body weight gain of local ducks aged one to eight weeks sequentially was as follows: 40, 125, 195, 170, 130, 200, 70, and 35 grams. Genetic and environmental factors influence female local ducks' high and low growth in West Sumatra. The opinion of Soeharsono [15] and Warwick et al. [16] stated that growth is the overall effect of heredity interactions with the environment or treatment, and the genetic contribution to appearance is about 30%. In comparison, the environmental contribution is about 70%.

This study resulted [17] that the Pitalah duck almost has the highest body weight between 8 and 12 weeks of age, followed by Kamang and Bayang. Body weight of 8 weeks ago, the highest remain from Pitalah duck (1084.03 g), but the weight of Kamang (1067.82 g) higher than Bayang (1033.67 g). While the weight of the 12 week old, ducks Pitalah regained the lead with the highest weight (1315.12 g) than Kamang (1304.02 g) and Bayang (1254.30 g)

### 3.3 Feed conversion

The average feed conversion of four breeds of West Sumatra female ducks during the starter period can be seen in Table 3.

**Table 3.** The average feed conversion of four breeds of West Sumatra female ducks at the starter period during the study.

Treatment	Feed Conversion
A	4,89 <sup>a</sup>
B	4,38 <sup>b</sup>
C	4,29 <sup>b</sup>
D	4,60 <sup>ab</sup>

Description: a-b a b Different superscripts by column show significant influence ( $P < 0.05$ )

A = Bayang duck, B = Kamang duck, C = Pitalah duck, and D = Sikumbang Janti duck

Based on Table, the feed conversion of four breeds of West Sumatra female ducks at the starter period of each treatment was A of 4.89, B of 4.38, C of 4.29, and D of 4.60. Based on the results of the analysis of variance showed that the maintenance of four breeds of West Sumatra female ducks at the starter phase had a significant effect ( $P < 0.05$ ) on the feed conversion.

The results of Rezki [18] research showed that the ration conversion of four local West Sumatran ducks, namely Pitalah ducks 5.91, Bayang ducks 5.68, Kamang ducks 5.68, and Sikumbang Janti ducks 5.77, the amount of ration conversion in Rezki's research [18] because the ducks were reared for 12 weeks. Kataren [19] reported that the average feed conversion of MA (Mojosari x Alabio) ducks for eight weeks was 3.43. The ration conversion in this study ranged from 4.29 to 4.89, which was greater than the research by [19], with a feed conversion of 3.43 to MA ducks (Mojosari x Alabio). The amount of ration conversion of four breeds of local female ducks in West Sumatra occurred because the ration consumption is not proportional to the resulting body weight. According to Kataren [20], the efficiency of rations measured in the conversion of laying duck rations in Indonesia still needs improvement, ranging from 3.2 to 5.0. The study's results by Zurmiati et al. [21] showed that the feed conversion range for Pitalah duck rations for eight weeks was 4.52 to 6.50. Based

on the research results by Zurmiati et al. [21], the feed conversion of four local female duck breeds in West Sumatra in the starter phase of this study was good.

## 4 Conclusion

From the study results, it can be concluded that four breeds of local female ducks from West Sumatra in the starter period at the same time and place, as well as a feed with the same ration energy, had no significant effect on ration consumption and body weight gain. In contrast, it had a significant effect ( $P < 0,05$ ) on the ration conversion. The conversion of rations for Bayang ducks was 4.89, Kamang ducks were 4.38, Pitalah ducks were 4.29, and Sikumbang Janti ducks were 4.60. Based on the feed conversion, female Pitalah ducks were more efficient than others.

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