The body weight performance of indigenous indonesian chickens in the grower phase

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Abstract. Body weight is a critical parameter to monitor in chickens due to its correlation with better performance during the production phase. Hence, this study aimed to present an overview of the body weight performance of indigenous Indonesian chickens in the grower phase. The study was conducted in Gunung Kidul, Yogyakarta. Data of body weight performance data of 227 Merawang, 157 Murung Panggang, and 416 KUB chickens in the grower phase were collected. These weights were measured 4 times at 6, 8, 10, and 12 weeks while rearing the chickens in battery cages in a closed house under similar management. The result showed that the Murung Panggang chickens at each age had the highest body weight and uniformity value (P<0.05), followed by Merawang and KUB. The body growth curve of the Merawang, Murung Panggang, and KUB chickens at the 6th week showed similar weights, ranging between 400-600 g. However, at the 8th, 10th, and 12th weeks, the Merawang and Murung Panggang chickens had higher body weight performance. Therefore, this study suggested that Merawang and Murung Panggang chickens may have a greater potential to attain higher final body weights.

Keywords: Indigenous chicken, body weight performance, grower phase

1. Introduction

Indigenous chickens are distributed diversely in the Indonesian archipelago with wide variations in body size, conformation, plumage color, and other characteristics. In this study, Merawang, Murung Panggang, and KUB chickens were used to represent the islands of Sumatra (Bangka Belitung and South Sumatra Province), Kalimantan (South Kalimantan Province) and Java (West and East Java Provinces). Merawang chickens have been reported to possess a moderate body conformation, high adaptability to tropical environments, brown-dominated feather color, alongside early maturity age, as they lay eggs at 5.5 months of age. As reported by Hidayat et al. [1], mature male and female Merawang chickens may reach 2147 ± 469 g and 1438 ± 243 g body weight. This differs from the Murung Panggang chickens, which originated from South Kalimantan, have a majorly dark or black color, reach full maturity at 5 months, and weigh up to 4 kg [2]. Conversely, the KUB chickens are a new line developed by Puslitbangtan with dual purposes to produce meat and egg [3]. Their body weight may reach 556.9 to 618 g in 10 weeks, and the females and males can attain 1561.27 g and 2074.53 g in 22 weeks, respectively. [3-4]. Consequently, the diverse chicken germplasm existing in Indonesia needs to be studied to enable the establishment of a breeding program for poultry production [5].

Generally, body weight is an important parameter to monitor in chickens because it is correlated with better performance during the production phase. Meanwhile, the grower phase in chickens is crucial in achieving the slaughter weight since cell size increases during this process, also called hypertrophy,
where the body frame grows until the ideal shape is attained. There are three critical ages to consider during the grower phase, namely 6–7, 12, and 14 weeks. The peak growth of the body frame (frame size) occurs between the 6th and 7th weeks, while the final dimension is achieved at 80% of the frame size [6]. Therefore, this study aimed to provide an overview of the body weight performance of indigenous Indonesian chickens during the grower phase.

2. Materials and methods

2.1. Materials
This study was conducted to evaluate the growth performance of indigenous Indonesian chickens, using three population types collected from the origin zone. Meanwhile, the study location was Gunung Kidul, Yogyakarta, and the data were gathered from the body weight performance of 227 Merawang, 157 Murung Panggang, and 416 KUB chicken in the grower phase. Their body weights were measured 4 times in 6, 8, 10, and 12 weeks, which represented the grower phase. The chickens evaluated were raised in a battery cage in a closed house under similar conditions.

2.2. Methods
Live weight data was collected by weighing the chickens every two weeks at the age of 6, 8, 10, 12 weeks (grower phase) on a scale with a 10 kg capacity and an accuracy of 1 g.

2.3. Statistical analysis
The analysis of variance (ANOVA) was conducted on the data, followed by Duncan's Multiple Range Test. [7]. Then, statistical analysis was performed using SPSS version 26 [8].

3. Results and discussion
As shown in Table 1, the Murung Panggang chickens had the highest body weight and uniformity values (P<0.05) at each age, followed by the Merawang and KUB chickens. The growths of the three indigenous chicken breeds were consistent with Rose [9], and the rise and shift in the body weights towards the adult range corresponded with their physiological conditions. Their body weight changes followed a sigmoid curve, meaning they increased slowly, then quickly, and slowly again or stopped. Generally, the breed is one of the factors that influence growth in chickens [10].

| Weeks of Age | Trait            | Merawang (n=227) | Murung Panggang (n=157) | KUB (n=416) |
|--------------|------------------|------------------|-------------------------|-------------|
| 6            | Body Weight (g)  | 477.22±78.345b   | 533.23±65.550a          | 417.67±65.740c |
|              | Uniformity (%)   | 45               | 60                      | 49          |
|              | Coefficient of variation (CV) (%) | 16.42       | 12.29                   | 15.74       |
| 8            | Body Weight (g)  | 693.11±121.728b  | 743.14±94.701a          | 582.62±107.226c |
|              | Uniformity (%)   | 39               | 62                      | 45          |
|              | Coefficient of variation (CV) (%) | 17.56       | 12.74                   | 18.40       |
| 10           | Body Weight (g)  | 927.59±163.317b  | 1043.57±126.370a        | 763.00±151.979c |
|              | Uniformity (%)   | 42               | 60                      | 40          |
|              | Coefficient of variation (CV) (%) | 17.61       | 12.11                   | 19.92       |
| 12           | Body Weight (g)  | 1149.12±192.294b | 1364.27±126.370a        | 945.56±180.255c |
|              | Uniformity (%)   | 45               | 60                      | 44          |
|              | Coefficient of variation (CV) (%) | 16.73       | 13.14                   | 19.06       |

Note: The means in the same rows with different superscripts are significantly different (P<0.05).
The body weight of the Merawang, Murung Panggang, and KUB chickens at 6 weeks of age ranged between 400-600 g. Subsequently, the weight growths from the highest to the lowest at weeks 8, 10, and 12 were Murung Panggang (743.14 ± 94.701 g, 1043.57 ± 126.370 g, and 1364.27 ± 126.370 g), Merawang (693.11 ± 121.728 g, 927.59 ± 163.317 g, and 1149.12 ± 192.294 g), and KUB (582.62 ± 107.226 g; 763.00 ± 151.979 g; and 945.56 ± 180.255 g), as shown in Figure 1. The Murung Panggang and Merawang chickens attained slaughter weight at 12 weeks, while KUB did not. According to Fathoni et al. [11] and Husna [12], the minimum slaughter weight of indigenous chicken is 700–1000 g at 8 weeks. Based on this study, the Murung Panggang and Merawang chickens can be slaughtered at 6 and 8 weeks, respectively.

4. Conclusion
This study showed that Murung Panggang and Merawang chickens may be excellent choices for meat production and may have more potential to reach a higher final body weight.

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