

Conference Paper

Phenotypic Characterization of the Quantitative Traits of Magelang Duck in Sempu Hamlet, Magelang Regency

A Rahayu^{1*}, S Ratnawati², R W Idayanti¹, L Hartati¹, and P B Pramono¹

¹Faculty of Agriculture, University of Tidar, Jl. Kapten Suparman No. 39, Magelang 56116, Central of Java, Indonesia

²Faculty of Economic, University of Tidar, Jl. Kapten Suparman No. 39, Magelang 56116, Central of Java, Indonesia

ORCID

<http://orcid.org/0000-0002-9398-0743>

Abstract.

The aim of this research was to analyze the phenotypic characterization on quantitative traits of Magelang ducks in Sempu Hamlet, Secang District, Magelang Regency. The Magelang Duck has been designated by the government as belonging to the original local Magelang family. The research material are 100 ducks from four farmers in Sempu Village, Secang District, Magelang Regency. The research method is descriptive analysis. The variable measured was the phenotypic characterization of body weight (BW), body length (BL), neck length (NL), chest circumference (CC), and body temperature (BT) of the duck entering the production phase. This research showed that the average BW, BL, NL, CC, and BT were $1,54 \pm 0,14$ kg; $58,89 \pm 2,05$ cm; $15,28 \pm 1,45$ cm; $33,57 \pm 1,23$ cm; and $40,59 \pm 0,89^{\circ}\text{C}$. Based on the results of this study, it can be concluded that the average physical size of Magelang Duck between the farmers were not much different from each other, as the farmer maintenance system were similar. This duck also has the characteristics of active poultry, because it moves more.

Keywords: Phenotypic, Characterization, Magelang Ducks, Sempu Hamlet.

1. Introduction

The development of livestock in Indonesia, especially the Magelang area, has increased every year, especially in the field of poultry. One of these types of poultry is Magelang ducks. Magelang ducks are a family of local Indonesian ducks that have been cultivated from generation to generation, thus becoming a wealth of Indonesia's local genetic resources. Magelang ducks come from mallard ducks that migrate to Indonesia and adapt to the environment and are then selected, so that characteristic characteristics emerge. The distribution area of Magelang ducks is Central Java province (Magelang Regency, Semarang Regency, Surakarta City, and Yogyakarta Special Region Province) [3]. These ducks are a local family that has been widely cultivated, one of which is in

Corresponding Author: A

Rahayu; email:

ayu.rahayu@untidar.ac.id

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the Sempu area. This duck is widely cultivated because of the production of meat and eggs which can be used for resale or for other products. According to [19], ducks have the following classification: kingdom: Animalia, phylum: Chordata, class: Aves, order: Anseriformis, family: Anatidae, genus: Anas, species: *Anas platyrhynchos*.

Magelang ducks are one of the most productive local poultry for producing meat and eggs. Along with domestic activity, ducks make various adaptations to adapt to the new environment. Adaptations such as very active behavior either in the cage or outside the cage [15] [18]. Animal behavior is an expression of an animal that is generated by all the factors that influence it, both internal and external factors that come from the environment [2]. Apart from being active, the ducks' behavior is eating and drinking to fulfill their daily needs. This is very influential on the growth of Magelang ducks. The better the quality of feed consumed, the more ducks will grow, especially their weight [12].

Magelang ducks have a characteristic white necklace around their neck, these ducks act as a source of egg production ranging from 48 - 70%, if they are intensively maintained, the production can reach 80%, Magelang ducks, which are rejected to be used as meat ducks [23]. According to [6], Magelang ducks have a large body proportion that can reach 1.5 kg, egg production is relatively high and has varied plumage colors compared to other local ducks [13]. According to [10], the difference between male and female Magelang ducks is in their posture, namely male ducks are slimmer when compared to female ducks. According to [14], the body weight of Magelang ducks is around ± 1.9 kg, body length $\pm 30, 67$ cm, neck length ± 14.18 cm and chest circumference ± 39.09 cm. From these data, the researcher wanted to find more complete information about the phenotypic characteristics of the quantitative traits of Magelang ducks in Magelang Regency.

2. Materials and Methods

This research was conducted in Sempu hamlet, Secang District, Magelang Regency by surveying several breeders in the area. The sample used in this study was 100 Magelang ducks. The equipment used is a sitting scale, tape meters, and other supporting tools to support this research. The samples taken were Magelang ducks that had entered the layer or production phase. The variables observed were body weight (BW), body length (BL), neck length (NL), chest circumference (CC) and body temperature (BT). This morphological measurement is carried out in several parts including the body length which is measured from the tip of the beak to the base of the tail, the neck length is

obtained from the measurement of the length of the duck's neck from the base of the neck to the bottom of the head, and the chest circumference which is obtained from the measurement of the length of the duck's chest. For body weight measurement, it is obtained by weighing the ducks. Any data obtained from the study will be compared with real data or normal standard data of ducks. This is to determine the quality of Magelang ducks in Sempu hamlet, Ngadirojo, Secang sub-district, Magelang district. Descriptions of the quantitative phenotypic characteristics of Magelang ducks were analyzed using descriptive statistical analysis which included the mean and standard deviation values. Data analysis using SPSS version 22.0 software.

3. Results and Discussion

Research data in the form of body weight (BW), body length (BL), neck length (NL), chest circumference (CC), and body temperature (BT) can be seen in Table 1.

TABLE 1: Mean of quantitative morphological characteristics of Magelang ducks.

Farmer	Parameters				BT (°C)
	BW (kg)	BL (cm)	NL (cm)	CC (cm)	
Farmer 1	1.82 ± 0.21	59.79 ± 2.60	11.29 ± 0.98	34 , 48 ± 2.21	40.61 ± 0.99
Farmer 2	1.41 ± 0.14	59.78 ± 1.85	17.04 ± 1.79	33.21 ± 1.61	41.14 ± 1.04
Farmer 3	1.48 ± 0.12	57.31 ± 2.02	15.94 ± 1.24	33.14 ± 1.11	40.31 ± 0.73
Farmer 4	1.46 ± 0.25	58.67 ± 2.57	16.83 ± 2.89	33.46 ± 1.45	40.33 ± 0.89

Quantitative traits are traits that can be measured, influenced by many gene pairs and environmental factors [17]. Measurement of this quantitative trait consists of chest circumference, body weight, body length, neck length and body temperature. Magelang ducks are the most dominant livestock raised by breeders in Sempu, Ngadirojo Village, Secang District, Magelang District. The survey which was carried out in four breeders showed a variety of physiological sizes of the ducks being kept. From the data obtained, the ducks are kept using a semi-intensive maintenance system, namely the maintenance is carried out in the cage and outside the cage. Ducks will be released or slaughtered in the rice fields to obtain additional food such as small insects or seeds. Towards noon, the ducks will be led to the cage and given food in the form of a mixture of bran, corn and rice bran. This is why the ducks that are kept by many breeders have large bodies. This is in accordance with the opinion of [23] which states that the body posture of the Magelang duck is relatively larger than other types of ducks in Indonesia, there are white feathers that are perfectly circular around the neck with a thickness of 1-2 cm

shaped like a necklace. So that the Magelang duck is known as the necklace duck. From breeder 1 (Mr. Darsin) with 28 ducks, the average body weight was 1.82 kg, BL 59.79 cm, NL 11.29 cm, CC 34.29 cm and BT 40.61°C. Breeder 2 (Mr. Margono) showed an average body weight of 1.41 kg, BL 58.79 cm, NL 17.04 cm, CC 33.21 cm and BT 41.14 °C. Breeder 3 (Mr. Tohari) showed an average body weight of 1.48 kg, BL 57.31 cm, NL 15.94 cm, CC 33.14 cm and BT 40.31 °C. Breeder 4 (Mr. Tofa) showed an average body weight of 1.46 kg, BL 58.67 cm, NL 16.83 cm, and CC 33.46 cm, and BT 40.33 °C. From the data held by the [3] and according to [6] male ducks have body weight of 1.8-2.5 kg and female ducks have body weight of 1.5-2.0 kg. The varying weight of ducks due to higher consumption of protein and energy will result in a faster growth rate. The effect of nutrition will be greater if the treatment is started at the beginning of the growth period, so that livestock growth can be manipulated by different nutritional treatments [4]. In addition, the growth is also influenced by genetic inherited from previous sires [11].

Growth rate, nutrition, age and body weight are factors that have a close relationship with one another. So that the increasing weight of the ducks, it will also affect others such as body length, neck length, and chest circumference. Meanwhile, body temperature is not influenced by duck weight. According to [20], normal body temperature in poultry ranges from 40.5-41.5 C, so to maintain this body temperature, birds are kept in an environment with temperatures ranging from 20-24°C and relative humidity around 50-70%. [9] stated that ducks are animals homeothermic with a comfort temperature of 24 °C. Of the four breeders in Sempu Hamlet, the average body temperature of ducks ranges from 40-41 °C. The high temperature of Magelang ducks in Sempu hamlet is also caused by the high ambient temperature. Ducks will try to maintain their body temperature in a relatively constant state, among others by increasing the frequency of breathing and the amount of drinking water consumption as well as decreasing feed consumption. The high environmental temperature in the tropics can result in the accumulation of heat in the body, so that livestock experience heat stress. High temperatures will reduce feed consumption and increase the need for drinking water [18]. The maintenance system which is carried out semi-intensively shows good growth, especially the ideal weight of all ducks. Livestock growth will not be affected if the surrounding environment factors, maintenance and management fulfilled in good condition [1].

Meanwhile, other physical characteristics are almost the same, it can be seen from the bright brown eye color, black feet color and dry texture, bright brown and light brown fur color, and normal wing size. From research conducted by [21] that the wing size of

Magelang ducks ranges from 34-36 cm. This is also influenced by the feed consumed by the ducks during growth. This has an overall effect on increasing the size of the tibia, beak length, wing length, body length, neck length and body weight of ducks. According to [23] the color of chest, back, and thigh hair is dominated by dark and light brown, with white wing tips, black-brown legs, black beak. In male ducks have a darker color than female cattle. From the farm owned by Mr. Margono, the majority of the ducks that are kept are white on the whole coat. Feather color variations in poultry are divided into two groups, namely the color produced by the presence of pigments with granule size and structural color, which is indicated by the presence of feathers breaking, absorbing, bending or reflecting light. Inheritance of coat color is a genetic complexity and the most important in the interaction between alleles and in alleles (Hardjosubroto, 2001). The feather color pattern of local Indonesian ducks is divided into nine, namely the color of branjang, namely the light brown color decorated with black striated; the color of the jarakan, namely dark brown decorated with black streaks (if there is a necklace around the neck it is called jarakan stripes); bosokan color, which is black when young, but as an adult turns dark brown; Gambiran colors, namely black and white; Weak color, which is a mix between light brown and gray; jalen and white colors, namely smooth white with orange or greenish yellow beak and legs; pudak color, namely white fur but black beak and legs; irengan color, namely dark black fur, and; The color of the crest, which is the dominant black color of the coat and there is a crest on the head [13] [16].

Some of the tails have longer wings than others, this is due to genetic disorders or heredity from previous parents. In addition, all ducks had active characteristics, which indicated that the ducks were in good health and were not attacked by diseases. This is in accordance with the opinion of [7] that good male and female ducks are bright and clear eyes, healthy bodies are not deformed, when walking the body position is upright, ducks are agile and active. The higher the quality of Magelang ducks, the effect on their reproduction, including egg production every day.

4. Conclusions

Based on the results of this study, it can be concluded that from research conducted on farmer in Sempu Hamlet, the average physical size of Magelang Duck viewed from the physical include has a size that is not much different. Because the farmer maintenance system with one another is not much different. This duck also has the characteristics of active poultry, because it moves more.

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