

Balinese and Landrace Pig Body Size Used for Spit Roast Pork

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Abstract. Spit roast pork or commonly called “be guling” is food from pigs of approximately 3-4-month-olds, varied between female or male pigs, filled with spices and vegetables such as cassava and grilled (rolled) to be cooked, marked by color transformation from skin color to brownish red and crispy skin. In Bali Island, Balinese and Landrace pigs are commonly used for cooking spit roast pork. The pig selection is determined by the market price and customer needs. A high market price and demand such as ceremonies lead people to select small-sized pigs; however, a low market price and demand (sold for consumption) lead people to select large-sized pigs. This study aimed to examine Balinese and Landrace pig body sizes used for spit roast pork. The study was performed by measuring the pig's length, height, chest circumference, and abdomen circumference. Data collected were then analyzed using the T-test to discover the mean difference. Meanwhile, the variation difference was tested using the F-test. The study demonstrated that Balinese pig's body size was insignificantly ($P>0,05$) smaller than the Landrace pig for spit roast pork on 3-4-month-olds. Balinese pig's body size had a significantly larger variation ($P<0.05$) (more varied) than the Landrace pig on 3-4-month-olds.

Keywords: Body size; Balinese pig; Landrace pig; Spit roast pork

I. INTRODUCTION

In general, there are three pig types in Indonesia, i.e., lard, bacon, and meat [1]. Bellini's peak is included in the largetype. Genetically, Balinese pig growth is slower than the import pigs. However, Balinese pig is more sustainable to diseases, saves more water, and can survive in a limited food condition. On the other hand, Landrace pig is originated from Denmark

and categorized as a high-quality bacon pig. Landrace pig is white with a long body resembling an arrow, wide, fine hair, and long legs. The male pig weighs approximately 320-410 kg, and the females weigh 250-340 kg. This pig's shortage is their weak hind legs, particularly during pregnancy, and pale meat [2].

According to [3], most Balinese people consume pork. The pork consumption per capita in Indonesia in 2019

reached 2.4 kg, increased from 2018 by 2.3 kg [4]. The Ministry of Agriculture recorded the pig population in Indonesia in 2018, reaching 8.5 million with the most population in East Nusa Tenggara (NTT) by 2.1 million. The number of pigs slaughtered and recorded reached 2 million in 2018. The highest sites were North Sumatera, with 385,758 pigs, and Bali, with 368,413 pigs [5].

Measurement determines the quantity, dimension, or capacity, usually against a standard or unit of measure. Measurement can also be interpreted as giving a number to a certain attribute or characteristic possessed by an organism. According to clear and agreed rules or formulations, measurements can be made at anything imaginable with different levels of complexity. For example, to measure height, the practitioner can easily measure since the object is tangible with internationally agreed units.

In spit roast pork cutting, various groups, gender, age, and sizes are utilized. The spit roast pork selection is determined by the market price and its need/demand level. A high market price and demand such as ceremonies lead people to select small-sized pigs; however, a low market price and demand (sold for consumption) lead people to select large-sized pigs. These two factors affect customers in selecting a spit roast pork. From these differences, we can discover size differences in each pig commonly used for

spit roast pork and the uncertain data regarding Balinese and Landrace pigs' size and differences. Therefore, a study concerning the morphometry of Balinese and Landrace pigs for spit roast pork is necessary.

II. MATERIAL AND METHODS

This study was observational, i.e., observing and measuring the body size of Balinese and Landrace pigs in the traditional pig slaughtering house, Mr. Mangku, at Banjar Ulapan, Blahkiuh Village, Abiansema District, Badung Regency.

The study procedure included measuring 16 male and female Balinese and Landrace pigs using a measuring tape and recording it on the databook. The measurement was initiated by recording the age, type, origin, and gender of Balinese and Landrace pigs. Then, weighing was performed using a digital animal scale. Body length, body height, chest circumference, and abdomen circumference measurements were conducted by a measuring tape. The body length (cm) measurement was carried out by measuring a straight line in front of the shoulder joint to the back edge of the sitting bone. Subsequently, the chest circumference (cm) measurement was measured around the chest just behind the shoulder blade. The abdomen circumference (cm) was performed by measuring the abdomen circumference right on the stomach. Ultimately, the body height (cm) was measured from the highest

part of the shoulder through the back of the scapula, perpendicular to the ground to the tip of the forefoot. Morphometric data were collected from each sample and gathered in a table.

The data were then analyzed using the T-test to examine the mean difference. Meanwhile, the variation difference was tested using the F-test. The analysis procedure employed the SPSS program [6].

III. RESULT

Data collection of 16 Balinese and Landrace pigs at the Mr. Mangku pig slaughtering house at Banjar Ulan, Blahkiuh Village, Abiansema District, Badung Regency obtained a decent target with an average age of 3-4 months, regardless of gender and weight of the pig.

Table 1. Weight, height, chest circumference and abdomen circumference measurement result of Balinese and Landrace pigs.

Pig Type	Measurement Type				
	Weight (Kg)	Height (Cm)	Length (Cm)	Chest Circumference (Cm)	Abdomen Circumference (Cm)
Balinese Pig	40.56±15.14	49.44±9.69	71.75±14.71	65.63±18.04	77.94±17.59
Landrace Pig	46.56±7.04	52.56±5.18	77.69±6.41	74.38±6.45	80.75±6.89

The results of the analysis of measurements of Balinese and Landrace pigs using the T-test found an insignificant body size difference ($P>0.05$), where Balinese pigs were smaller than Landrace pigs for spit roast pork at 3-4 months. Meanwhile, the body size of Balinese pigs ($P<0.05$) was greater in variation (more varied) than Landrace pigs for spit roast pork at 3-4 months.

The body size and its variation difference results are presented in Figure From the estimation graph, the upper and lower limit ordinates of Balinese pig body size intersect each other. It shows an insignificant difference ($P>0.05$). Balinese pigs' ordinate distance from upper and lower limits was greater than in Landrace pigs, indicating a more varied body size of Balinese pigs than Landrace pigs.

IV. DISCUSSION

Balinese and Landrace pigs at the Mr. Mangku slaughtering house in Bali were usually transported by farmers or spit roast pork sellers to chop.

The observation and measurement results of 16 Balinese and Landrace pigs showed that Balinese pig size was insignificantly different from Landrace pigs ($P>0.05$) at 3-4 months. However, their body size variation was greater ($P<0.05$) than Landrace pigs at 3-4 months.

Balinese pigs are considered slow-growth compared to Landrace pigs since they do not experience selection and are cared for extensively. Genetically, Balinese pig's growth is slower than import pigs, including Landrace pigs [7]. Landrace pigs have a more intensive maintenance system than Balinese pigs. The common Landrace pig's size is bigger at 3-4 months than Balinese pigs where their growth is logistic, i.e., relative growth adjusted to the age. In other words, increased age will achieve a maximum body size. However, it can be affected if the maintenance and feeding systems in Balinese pigs are performed intensively as in Landrace pigs.

Based on the field data, 3-month Balinese pigs had greater weight than Landrace pigs. The interview finding from Mrs. Sri from Bangli revealed that no difference is present in maintaining Balinese

and Landrace pigs. It indicates that feed, ration, vitamin, and mineral administration is carried out orderly with equal doses in Balinese and Landrace pigs. It follows a statement by [8] where the Balinese pig's growth curve tended to be slower than in Landrace pigs due to the extensive maintenance where kitchen waste becomes their feed. In other words, regular ration, protein, mineral, and vitamin administration will equalize Landrace pig's growth at 3-4 months.

Balinese pig's body size had a greater variation ($P<0.05$) than Landrace pigs at 3-4 months. It is affected by the relatively slower growth of Balinese pigs than Landrace pigs, which may follow Landrace pig's intensive farming. The cattle data from field observations were different since they were sourced from different farms, resulting in varied data sizes of Landrace pigs. This study result demonstrated that Balinese pig cutting variation for spit roast pork is more varied than Landrace pigs because Balinese pigs are more varied regarding ceremony needs, while Landrace pigs are commonly used for consumption. Balinese pigs do not undergo a selection, while Landrace pigs are selected. Selected cattle will have a uniform body size, while unselected cattle will have a varied body size. Diversity is a vital population nature when breeding, especially in selection. Selection becomes effective if the diversity level is high [9].

V. CONCLUSION

Balinese pig's body size for spit roast pork was insignificantly different from Landrace pigs at 3-4 months. However, their body size was more varied than Landrace pigs at 3-4 months. Also, the utilization variation of spit roast pork from Balinese pigs was more varied, primarily for ceremony need than consumption need.

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