IDENTIFICATION OF BODY LENGTH, BODY DIAGONAL, CHEST CIRCUMFERENCE, AND SHOULDER HEIGHT OF FEMALE PRIANGAN SHEEP AT SP3TDK TAMBAK MEKAR SUBANG REGENCY

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ABSTRACT

One of the indigenous sheep breeds that has flourished in Indonesia is the Priangan. The purpose of this study was to measure the female Priangan sheep's body size at SP3TDK Tambak Mekar in Subang Regency. 51 female sheep in all, 23 between the ages of 6 months and ≤1 year and 28 between the ages of 1 and 2 years, were used. Using a measuring tape and a measuring stick, measurements of shoulder height, chest circumference, body length, and body diagonal were made three times. Data were collected using the census method and analyzed descriptively. The results showed that the average body length of female Priangan sheep aged 6 months–≤1 year was 46.35 ± 4.61 cm, and those aged >1–2 years were 54.26 ± 3.77 cm. The average body diagonal was 50.26 ± 4.28 cm and 58.42 ± 3.06 cm, chest circumference 54.74 ± 4.96 cm and 62.91 ± 4.60 cm, and shoulder height 55.53 ± 3.78 cm and 62.11 ± 3.76 cm, respectively. It can be concluded that the body size of female Priangan sheep increases with age, indicating progressive growth that supports superior trait selection and productivity improvement.

Keywords : *Priangan sheep, body length, body diagonal, chest circumference, shoulder height.*

Introduction

Livestock farming is essential to fulfilling the animal protein requirements of the Indonesian population. Sheep is one of the livestock commodities with great potential for development. Sheep have a high reproduction rate, fast growth and good adaptability to local conditions and feed. According to the Central Statistics Agency (2025), the national sheep population reached 9,219,176, with West Java Province contributing 75% of that number. Which is the main center for sheep's development in Indonesia.

One of the local sheep breeds from West Java is the Priangan sheep, which has a high economic value and plays an important role as a source of animal protein and income for farmers. This sheep has the advantages of high adaptability, good prolificacy, and high reproductive efficiency (Heriyadi & Nurmeidiansyah, 2015). According to the Ministry of Agriculture Decree of the Republic of Indonesia Number 300/Kpts/SR. On May 5, 2017, Priangan Sheep was declared as an official local breed that needs to be protected and developed by the Ministry of Agriculture of the Republic of Indonesia.

One of the institutions engaged in developing and improving the genetic quality of Priangan sheep is the Sheep and Goat Breeding Development Implementation Unit (SP3TDK) Tambak Mekar, Subang Regency. It is very important to identify the quantitative body size traits such as body length, body diagonal, chest circumference and shoulder height in order to support the selection of superior breeds. Body size is a reflection of growth rate and meat production performance in animals and it can be utilized as a selection criterion to estimate genetic potential. Even though these sheep may look almost identical, it's still possible to tell them apart. Beneath that uniform appearance are small genetic differences, and careful tracking of growth data helps reveal which sheeps truly perform the best.

This study aims to determine body length size, body diagonal size, chest circumference and shoulder height of female Priangan sheep in SP3TDK Tambak Mekar, Subang Regency which can be selected as a reference for improving the genetic quality of Priangan sheep in the future.

Materials and Methods

The research subjects consisted of 51 female Priangan sheep and it placed into two groups by age. There are 23 subjects with an age between 6 months and 1 year old and 28 subjects which are between 1-2 years of age. Taking animals as an example, this section will look at how to measure four body size parameters, like body length, body diagonal, chest circumference, and shoulder height. The method of this research is descriptive method of quantifying data by such numerical analysis (Sugiyono, 2019). This strategy objectively characterises and describes what exactly the measurements are employing concrete data. Data collected via direct means in the field using the census method. The census method was applied as the study encompassed the entire available population at the research site, totaling 51 sheep. This population was fully categorized by age, consisting of 23 young sheep and 28 adult sheep. Since every individual in these age groups was measured, the data represents a total enumeration of the specific population rather than a sample. Age data for the sheep was given recorded information from SP3TDK Tambak Mekar, Subang Regency.

Variables Observed

1. Body Length (BL) is the straightline distance from *the processus spinosus* of the highest *thoracic vertebra* to the ischial tuberosity (sitting bone), measured using a measuring tape in cm (Heriyadi & Mayasari, 2006)
2. Body Diagonal (BD) is a body measurement that can be measured from the edge of *the humerus* to the tuberosity of the ischium (*tuber ichii*) using a measuring stick in cm (Utama *et al.* 2024)
3. Chest Circumference (CC) is measured around the chest cavity through *the scapula* using a measuring tape in cm (Heriyadi & Mayasari, 2006).
4. Shoulder Height (SH) is the highest distance from the shoulder to the ground, measured using a measuring stick in cm (Heriyadi & Mayasari, 2006)
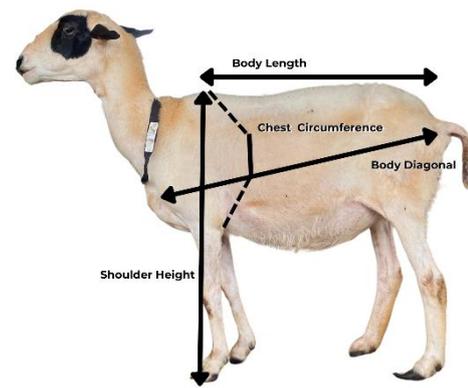

Illustration 1. How to Measure Body Length, Body Diagonal, Chest Circumference, and Shoulder Height of Sheep (Source : Heriyadi & Mayasari (2006); Utama *et al.* 2024)

Results and Discussion

General Conditions of SP3TSK Tambak Mekar, Subang Regency

Satuan Pelaksana Pengembangan Perbibitan Ternak Domba Kambing (SP3TDK) Tambak Mekar Tambak Mekar sits in Tambak Mekar Village, Jalan Cagak Subdistrict, Subang, West Java. The place covers about 26.5 hectares, 2.5 for pens and offices, 20 for plantations, and another 4 for growing forage. If you're looking at a map, it's at 107º31'54.12" E and 6º11'49.20" S, up in the hills at around 300 to 400 meters above sea level. The weather's pretty much what you'd expect from the tropics: warm, with temperatures between 28 and 32°C, humidity ranging from 57 to 73%.

The livestock population at SP3TDK reached 1,388 heads, consisting of Priangan sheep, Non-Garut sheep (a cross between Thin Tail, Fat Tail, Suffolk, Dorper, Texel, and Merino sheep), and goats. The study was conducted in pen B1, which is a breeding pen for Priangan sheep with a total population of 153, consisting of 104 females and 49 males. The maintenance system is intensive, with a colony pen for weaned lambs and naturally mated ewes, and individual head-to-head pens for pregnant and lactating ewes.

Feed was given twice a day (at 08.00 and 16.00 WIB) with a composition of 2.94 kg of forage and 0.33 kg of concentrate per head per day. The feed was mixed using a TMR Feed Mixer with added minerals and salt to make it homogeneous, increase palatability, and facilitate distribution.

Table 1. Nutrient Content of Feed at SP3TDK Tambak Mekar, Subang District

Feed Ingredient	Nutrient Content (%)				
	DM	Ash	CP	CF	TDN
Concentrate[1]	86,00	13,00	14,00	14,00	60,00
Elephant Grass[2]	18,00	15,40	9,10	33,10	55,00
Odot Grass[3]	22,73	12,02	15,91	23,37	-
Mineral Mix[*]	-	-	-	-	-
Salt[*]	-	-	-	-	-

Sources: [1]Concentrate Content Label CV Trisila Agri Perkasa; [2]Hartadi *et al.* (2017); [3] Dumadi *et al.* (2021) as cited in BPMKP/BP (2019); [*]Feed supplements that do not contain macro nutrients, but serve as sources of minerals and electrolytes

The table shows the nutrient composition of feed at SP3TDK Tambak Mekar, which consists of concentrate, forage (elephant grass, odot, and pakchong), and mineral mix and salt supplements. Based on Table 1, the nutrient composition sufficiently meets the nutritional requirements of sheep, particularly regarding protein content and total digestible nutrients (TDN), which are at least 12% and 55% in the feed ration for sheep aged 5-7 months (Hasan et al., 2022), and the nutrient requirements of adult sheep aged 1–2 years in the maintenance phase indicate that the ration needs to contain an energy level equivalent to TDN of around 55–60% and crude protein of around 10–12%, which is influenced by differences in body weight (NRC, 2006). Mineral mix supplements and salt maintain bone health, enzyme activity, and electrolyte balance in livestock (Hession *et al.,* 2022).

Body Length of Female Priangan Sheep

Body length is an important indicator of livestock quality, as it reflects physical capacity and can be used to estimate carcass size and growth efficiency in sheep. The results of the study on the body length of female Priangan sheep at 6 months–≤1 year and >1–2 years conducted at SP3TDK Tambak Mekar, Subang District, are presented in Table 2.

Table 2. Body Length of Female Priangan Sheep

No	Value	Age 6 months – ≤ 1 year	Age > 1-2 years
1	Average (cm)	46.35	54.26
2	Minimum (cm)	39.67	44.17
3	Maximum (cm)	59.43	59.53
4	Standard Deviation (cm)	4.61	3.77
5	Coefficient of Variation (%)	9.94	6.95

Priangan ewes at SP3TDK Tambak Mekar showed clear growth as they got older. At 6 months to about a year old, their average body length was 46.35 ± 4.61 cm. Once they passed the one-year mark and reached up to two years, that number jumped to 54.26 ± 3.77 cm (Table 2). So, as expected, they grew longer with age, right in line with what Choiria *et al*. (2016) that said livestock just get bigger as they get older.

There are slight differences in this comparison. Heriyadi and Nurmeidiansyah (2015) reported that female sheep aged 6–12 months had an average body length of 46.68 ± 2.79 cm, slightly higher than the results of this study at that age. However, as the sheep entered older ages, the data in this study actually showed larger sizes. They noted that female sheep aged over one year to two years only had a body length of 50.26 ± 3.28 cm, which was still lower than the results in Table 2. Meanwhile, research by Yuliandri and Imanudin (2020) on local sheep in Majalengka showed that female sheep aged one year or older had a body length of 46.85 ± 2.14 cm, so that Priangan sheep in Tambak Mekar again appeared to be superior in terms of body length. According to Fauzi *et al*. (2022), variations in livestock growth can be caused by genetic and environmental factors. However, this measurement still falls short of the body length of Priangan sheep in Garut according to

Choiria *et al.* (2016), which averaged 60.82 ± 6.26 cm. This occurred because the research subjects used by Choiria et al. (2016) were ewes that had likely been pregnant more than once or twice and had given birth to lambs, resulting in larger bodies.

The coefficient of variation in body length at SP3TDK was recorded at 9.94% in sheep aged 6 months to one year, then decreased to 6.95% in the group aged more than one to two years. This decrease indicates that the size of sheep becomes more uniform with age. With these values, this population is classified as homogeneous and reflects good husbandry practices. Warmadewi *et al.* (2020) state that a population can be categorized as homogeneous if its coefficient of variation is less than 15%. Thus,

Priangan sheep at SP3TDK can be said to belong to a uniform population. This uniformity is also an indication of good environmental management and husbandry, enabling most sheep to achieve optimal growth.

Body Diagonal of Female Priangan Sheep

Body diagonal is a key metric for predicting carcass weight, as it effectively shows how body dimensions relate to meat production. The measurements of body diagonal in female Priangan sheep aged 6 months to ≤1 year and >1 to 2 years, conducted at SP3TDK Tambak Mekar in Subang District, are presented in Table 3.

Table 3. Body Diagonal of Female Priangan Sheep

No	Value	Age 6 months – ≤ 1 year	Age > 1-2 years
1	Average (cm)	50.26	58.42
2	Minimum (cm)	42.10	50.87
3	Maximum (cm)	60.63	64.30
4	Standard Deviation (cm)	4.28	3.06
5	Coefficient of Variation (%)	8.52	5.24

The results of the study show that Priangan ewes at SP3TDK Tambak Mekar have an average body diagonal length of 50.26 ± 4.28 cm at 6 months to less than one year of age. This average increases to 58.42 ± 3.06 cm in the age group above one year to two years, reflecting healthy growth characterized by stronger bone structure and increased muscle development over time. These measurements exceed the values reported by Suryani *et al.* (2023) for Thin-tailed female sheep under one year of age (49.50 ± 3.74 cm), as well as surpassing the values recorded for local female sheep aged 10–12 months (49.31 ± 0.95 cm). Even when compared to older local sheep (13–16 months), Priangan sheep still showed superior growth, exceeding the average of 51.38 ± 1.04 cm and 56.15 ± 1.03 cm reported by Pandie *et al.* (2021). These results indicate that Priangan sheep have stronger growth potential, likely due to genetic factors and high-quality management practices, and health care implemented at SP3TDK Tambak Mekar. Livestock management at SP3TDK follows standardized protocols, including daily pen cleaning, regular bathing, and periodic hoof trimming. The health program integrates routine oral deworming and blood monitoring, with intramuscular antibiotics and

vitamins administered as needed to support recovery and growth. To maximize early nutrition, lambs remain with their dams for a two-month pre-weaning period before being transitioned to post-weaning colony pens in the third month.

The coefficient of variation for body diagonal measurements was 8.52% at 6 months to less than one year of age, decreasing to 5.24% in the older age group (>1–2 years). This decrease indicates an increase in body size uniformity as the sheep grow. These values are lower than the 7.56% variation in thin-tailed sheep under one year of age reported by Suryani *et al.* (2023), but still show good consistency within the group. According to Warmadewi *et al.* (2020), populations with a coefficient of variation below 15% can be classified as homogeneous. Therefore, Priangan ewes at SP3TDK Tambak Mekar can be considered a uniform and well-managed population.

Chest Circumference of Female Priangan Sheep

Chest circumference can be used to predict livestock weight because chest circumference development is consistent with bone, muscle, and fat proportion development. Measurements of chest circum-

ference of Priangan female sheep aged 6 months to ≤1 year and more than 1 to 2 years, collected at SP3TDK Tambak Mekar in Subang Regency, are shown in Table 4.

Table 4. Chest Circumference of Female Priangan Sheep

No	Value	Age 6 months – ≤ 1 year	Age > 1-2 years
1	Average (cm)	54.74	62.91
2	Minimum (cm)	46.03	51.17
3	Maximum (cm)	63.33	70.50
4	Standard Deviation (cm)	4.96	4.60
5	Coefficient of Variation (%)	9.06	7.31

From this result, it can be concluded that the mean chest circumference of Priangan sheep at SP3TDK Tambak Mekar aged 6 months to ≤1 year is 54.74 ± 4.96 cm. The higher age group, consisting of animals more than one up to two years old, had a mean chest circumference of 62.91 ± 4.60 cm. This result indicates normal body growth, with the chest developing to expand the muscles and support vital organs such as the heart and lungs. These measurements recorded are lower than those reported by Heriyadi & Nurmeidiansyah (2015), who measured an average chest circumference of 65.47 ± 4.17 cm in 6- to 12-month-old Priangan ewes and 71.57 ± 4.93 cm in ewes older than one to two years. This difference is likely due to variations in research location and environmental conditions, as the study by Heriyadi & Nurmeidiansyah (2015) was conducted in several areas with different climatic characteristics, while this study was only conducted in Subang. Sheep in lowland environments have smaller growth and body size due to high temperatures and heat stress compared to sheep in highland areas (Tüfekci & Sejian, 2023). Climate change factors also influence body size. BMKG (2024) reports that Indonesia's average temperature has risen by 0.2°C per decade since 1981, driven by increasing greenhouse gas concentrations. Nevertheless, the chest circumference of

female Priangan sheep aged >1–2 years at SP3TDK Tambak Mekar was larger than that of Thin-tailed sheep of the same age in the study by Yantoro *et al.* (2020), which was 62.55 ± 5.39 cm.

The coefficient of variation of chest circumference was 9.06% at 6 months–≤1 year of age and decreased to 7.31% at >1–2 years of age, indicating that as age increases, the diversity of body size between individuals decreases and the population becomes more homogeneous. This value is lower than the coefficient of variation of Priangan sheep of 10.42% reported by Choiria *et al.* (2016), indicating that the Priangan sheep population at SP3TDK Tambak Mekar has better body shape uniformity. Following the statement of Warmadewi *et al.* (2020), populations with a coefficient of variation below 15% are classified as homogeneous. It follows that Priangan sheep at SP3TDK Tambak Mekar can be categorized as uniform and having optimal body growth.

Shoulder Height of Female Priangan Sheep

Shoulder height depends on the skeletal framework that supports the animal's overall posture and balance. The shoulder height measurements of female Priangan sheep aged 6 months to ≤1 year and over 1 to 2 years, recorded at SP3TDK Tambak Mekar in Subang Regency, are shown in Table 5.

Table 5. Shoulder Height of Female Priangan Sheep

No	Value	Age 6 months – ≤ 1 year	Age > 1-2 years
1	Average (cm)	55.53	62.11
2	Minimum (cm)	50.57	54.43
3	Maximum (cm)	64.60	70.40
4	Standard Deviation (cm)	3.78	3.76
5	Coefficient of Variation (%)	6.81	6.05

The results obtained revealed that female Priangan sheep in SP3TDK Tambak Mekar increased

significantly in terms of growth according to age. The length measurements of 46.35 ± 4.61 cm to 54.26 ±

3.77 cm indicated an increase in body length corresponding to 6 months to 1-year-old and 1- to 2-year-old sheep, respectively (Table 2). These results were similar to those obtained by Choiria *et al.* (2016) concerning increases in body length according to age.

Based on this comparison, there is a considerable difference. The body length (46.68 ± 2.79 cm) on ewes aged 6-12 months is slightly higher according to Heriyadi & Nurmeidiansyah (2015)'s study, although this study revealed that it is higher on older animals. The body length on ewes aged 1-2 years is merely 50.26 ± 3.28 cm according to Heriyadi & Nurmeidiansyah (2015)'s study, which is much lower than what is obtained in this study (Table 2). The body length on female Priangan sheep aged ≥1 years in Majalengka according to Yuliandri & Imanudin (2020) reached 46.85 ± 2.14 cm. This indicates that, generally, SP3TDK Tambak Mekar has better body length than other regions. These values, however, were smaller than those revealed by Choiria *et al.* (2016) on same breed of sheep but in Garut, which reached 60.82 ± 6.26 cm on body length. Putrayana *et al.* (2024) stated that differences in sheep body size can be influenced by genetic factors as well as environmental conditions.

The coefficient of variation of shoulder height at SP3TDK is 6,81% for ages within 6 months to 1 year, which was reduced to 6.05% within 1 to 2 years of ages. This shows that homogeneity in body size is higher with advancing ages. Thus, this population can be termed to belong to a homogenous population, which signifies proper management qualities. As stated by Warmadewi *et al.* (2020), if a population is homogenous, its coefficient of variation is less than 15%. Therefore, Priangan sheep found at SP3TDK are homogenous to some extent because their percentage is less than 15%. This homogeneity signifies uniformity in management and environmental factors, which enhance correct growth of animals within such a population.

Conclusion

From the results and discussion, the study concludes that:
1) The average body length of female Priangan sheep was 46.35 ± 4.61 cm at 6 months to ≤1 year of age, increasing to 54.26 ± 3.77 cm in the > 1-2 years age group.
2) The average body diagonal of female Priangan sheep was 50.26 ± 4.28 cm at 6 months to ≤1 year of age, increasing to 58.42 ± 3.06 cm in the >1-2 years age group.
3) The average chest circumference of female Priangan sheep was 54.74 ± 4.96 cm at 6 months to ≤1 year of age, increasing to 62.91 ± 4.60 cm in the >1-2 years age group.
4) The average shoulder height of female Priangan sheep was 55.53 ± 3.78 cm at 6 months to ≤1 year of age, increasing to 62.11 ± 3.76 cm in the > 1-2 years age group.

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