Morphological characteristics of Simeulue buffalo in Simeulue District of Aceh Province, Indonesia

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Abstract. The purpose of this study was to identify the morphological characteristics of Simeulue buffalo in Simeulue district of Aceh Province, Indonesia, the reason is because the lack of morphological data of simeulue buffalo. This research used survey method in ten villages within Simeulue district, namely: Ujung Salang, Along, Panten Lawe, Mutiara, Padang Unoi, Karya Bakti, Tamon Jaya, Meunafa, Jaya Baru and Tameng. The material consisted of fifty Simeulue buffaloes aged 3-7 years (25 male and 25 female). Determination of buffalo samples is done by simple random sampling method. The collected data was analyzed using a frequency table, averaged, and standard deviations. The parameters observed were: (a) chest circumference; (b) shoulder heigth; (c) body length; (d) chest width; and (e) hip height. The results showed that the mean of chest circumference for female and male Simeulue buffalo was 173.08 ± 8.99 and 165.68 ± 0.14, shoulder heigth was 122.33 ± 0.33 and 118 ± 1.44, body length was 125.54 ± 0.96 and 120 ± 1.16, chest width was 37.32 ± 4.09 and 34.28 ± 2.34, hip height was 118.05 ± 1.40 and 114.32 ± 1.07, respectively. It can be conclude that the average body measurements of the Simeulue buffalo are classified as medium size both male and female. The body sizes of the male Simeulue buffalo are larger than those of the female Simeulue buffalo. The average body size of Simeulue buffalo is not much different from the body size of several types of buffalo outside Simeulue Island.

1. Introduction
Buffalo are one of the important domestic animals in Indonesia. They are also regarded as excellent meat producers. Simeulue buffalo is one of animal genetic resources of Aceh Province. Habitually, Simeulue buffalo consists of mountain buffalo and coastal buffalo, but there is no data that reveals the difference in genetic or chromosome number [8]. Female Simeulue buffalo has the potential to produce calf, whereas female buffalo which is used as a mother, ideally has a standard body size. The initial steps that need to be taken in an effort to maintain and develop Simeulue buffalo resources include collecting information and characterization related to quantitative traits. Initial data on buffalo quantitative traits are useful for further policy determination in buffalo breeding so that it becomes a potential source of animal food for the people. Although Simeulue buffaloes have been stated as animal genetic resources from Aceh Province, the morphology data of Simeulue buffalo is still incomplete. Based on these facts, therefore this research was conducted in an effort to preserve the existence of Simeulue buffalo through study on the characteristics of morphological body size of Simeulue buffalo.
2. Materials and Methods
This study uses a survey method by measuring directly the buffalo which will be use as research sample. The selection of the location of this study was done purposively (purposive sampling) with consideration of districts that have the largest buffalo population in Salang sub district, and determination of buffalo samples is done by simple random sampling method. The parameters observed were: (a) chest circumference; (b) shoulder height; (c) body length; (d) chest width; and (e) hip height. The collected data was analyzed using a frequency table, averaged, and standard deviations. The data obtained is processed and then descended and described descriptively.

3. Results and Discussion

3.1. Chest Circumference
Many body measurements are associated with body weight. The results of Simeulue buffalo chest circumference measurements in Salang sub district, Simeulue District are shown in Table 1.

| No. | Village       | Male (n) | Female (n) |
|-----|---------------|----------|------------|
| 1   | Ujung Salang  | 2 170.50 | 3 164.67   |
| 2   | Along         | 2 177.00 | 4 164.75   |
| 3   | Panten Lawe   | 4 179.25 | 1 166.00   |
| 4   | Mutiara       | 3 171.33 | 7 164.86   |
| 5   | Padang Unoi   | 2 171.00 | 5 165.40   |
| 6   | Karya Bakti   | 4 169.25 | 1 166.00   |
| 7   | Tamon Jaya    | 2 178.50 | 1 165.00   |
| 8   | Meunafa       | 2 165.00 | 1 164.00   |
| 9   | Jaya Baru     | 2 177.50 | 1 165.00   |
| 10  | Tameng        | 2 167.25 | 1 165.00   |
|     | Total         | 25 1730.08 | 25 1650.68 |
|     | Average       | 173.08±8.99 | 165.68±0.14 |

Note: (n) = number of Simeulue buffalo samples

The average chest circumference size of male Simeulue buffalo is bigger than the size of the male buffalo that [4] studied in Banten which is 166 cm. However, it is smaller than the average circumference of male buffalo in Sumatra by [9] and [5] and which are 182.16 cm and the Belang Toraja buffalo from [1] which is 183.68 cm. Based on observations, the average data of Simeulue buffalo chest circumference in Salang sub district, Simeulue District varies according to different ages. The higher the age of Simeulue buffalo, the average chest circumference of Simeulue buffalo is also higher. This is consistent with stated of [1] in his research on the body size of the Belang Toraja buffalo.

3.2. Shoulder Height
Shoulder height needs to be known to provide information on livestock growth and also can be used to estimate body weight and influence the attractiveness of these animals. Simeulue buffalo shoulder height in Salang Sub-district, Simeulue district can be shown in Table 2.
Table 2. The average shoulder height of Simeulue Buffalo

| No. | Village       | Shoulder Height (cm) |          |          |          |          |
|-----|---------------|----------------------|----------|----------|----------|----------|
|     |               | (n)                  | Male     | (n)      | Female   |          |
| 1   | Ujung Salang | 2                    | 121.50   | 3        | 115.67   |          |
| 2   | Along        | 2                    | 120.00   | 4        | 118.00   |          |
| 3   | Panten Lawe  | 4                    | 122.25   | 1        | 117.00   |          |
| 4   | Mutiara      | 3                    | 122.33   | 7        | 119.57   |          |
| 5   | Padang Unoi  | 2                    | 121.50   | 5        | 115.60   |          |
| 6   | Karya Bakti  | 4                    | 122.25   | 1        | 115.00   |          |
| 7   | Tamon Jaya   | 2                    | 122.00   | 1        | 120.00   |          |
| 8   | Meunafa      | 2                    | 123.00   | 1        | 119.00   |          |
| 9   | Jaya Baru    | 2                    | 123.00   | 1        | 120.25   |          |
| 10  | Tameng       | 2                    | 122.50   | 1        | 119.00   |          |
|     | Total        | 25                   | 1220.33  | 25       | 1179.09  |          |
|     | Average      |                      | 122.33±0.33 |        | 118±1.44 |          |

Note: (n) = number of Simeulue buffalo samples

The average size of male buffalo shoulder height in Salang sub district, Simeulue District in this study is higher than the average size of buffalo shoulder height from [10] in various regions in Indonesia such as in Bogor 113.17 cm, Brebes 113.22 cm, and Siborong 114.50 cm.

3.3. The Body Length

The average body length has a very important role in determining the body weight of ruminants such as buffalo. The body length of the Simeulue buffalo in Salang sub district of Simeulue District is shown in Table 3.

Table 3. The average body length of Simeulue Buffalo

| No. | Village       | The body length (cm) |          |          |          |          |
|-----|---------------|----------------------|----------|----------|----------|----------|
|     |               | n                    | Male     | N        | Female   |          |
| 1   | Ujung Salang | 2                    | 126.48   | 3        | 120.67   |          |
| 2   | Along        | 2                    | 125.50   | 4        | 121.00   |          |
| 3   | Panten Lawe  | 4                    | 124.00   | 1        | 119.00   |          |
| 4   | Mutiara      | 3                    | 123.67   | 7        | 121.43   |          |
| 5   | Padang Unoi  | 2                    | 125.00   | 5        | 119.40   |          |
| 6   | Karya Bakti  | 4                    | 127.00   | 1        | 122.00   |          |
| 7   | Tamon Jaya   | 2                    | 123.00   | 1        | 120.00   |          |
| 8   | Meunafa      | 2                    | 126.50   | 1        | 115.86   |          |
| 9   | Jaya Baru    | 2                    | 128.00   | 1        | 121.00   |          |
| 10  | Tameng       | 2                    | 126.25   | 1        | 119.00   |          |
|     | Total        | 25                   | 125.40   | 25       | 1199.36  |          |
|     | Average      |                      | 125.54±0.96 |        | 120±1.16 |          |

Note: (n) = number of Simeulue buffalo samples

When compared with previous result reports on several swamp buffalo populations in Indonesia, the average body length of the Simeulue female buffalo in Salang sub district, Simeulue District is smaller than the swamp buffalo in Tempursari district by [3] is 123.10 cm, [1] is 139.6 cm, and [6] is 134.65 cm, but larger than the body length of the swamp buffalo results of [9] which is 119.14 cm.
3.4. The Chest Width

According to [7] the chest has a very important role in providing information about the body’s capacity to utilize feed and convert feed to meat and muscles efficiently. The average value in the chest width of Simeulue buffalo in Salang sub district, Simeulue District can be seen in Table 4.

| No. | Village       | n Male | n Female | Male | Female |
|-----|---------------|--------|----------|------|--------|
| 1   | Ujung Salang  | 2      | 3        | 35.00| 35.00  |
| 2   | Along         | 2      | 4        | 43.00| 35.00  |
| 3   | Panten Lawe   | 4      | 1        | 33.68| 33.00  |
| 4   | Mutiara       | 3      | 7        | 39.00| 29.50  |
| 5   | Padang Unoi   | 2      | 5        | 41.00| 32.00  |
| 6   | Karya Bakti   | 4      | 1        | 33.25| 33.25  |
| 7   | Tamon Jaya    | 2      | 1        | 36.00| 36.00  |
| 8   | Meunafa       | 2      | 1        | 35.00| 34.00  |
| 9   | Jaya Baru     | 2      | 1        | 40.00| 38.00  |
| 10  | Tameng        | 2      | 1        | 37.25| 37.00  |
|     | Total         | 25     | 25       | 373.18| 342.75|
|     | Average       | 37.32±4.09 | 34.28±2.34 |

Note: (n) = number of Simeulue buffalo samples

Based on Table 4, the average value in the chest width of buffalo male and female Simeulue in Salang sub district is even higher than the average value of local buffalo results of research by [4] namely 39.50 cm male and 36.75 cm female.

3.5. The Hip Height

The average value of Simeulue buffalo hip height in Salang sub district, Simeulue district is shown in Table 5. The results showed that, the average size of male and female buffalo hip height in Salang District were 118.05 ± 1.40 cm and 114, respectively.

| No. | Village    | n | Male | n | Female |
|-----|------------|---|------|---|--------|
| 1   | Ujung Salang | 2 | 119.00| 3 | 115.00 |
| 2   | Along      | 2 | 119.25| 4 | 113.00 |
| 3   | Panten Lawe| 4 | 116.00| 1 | 117.68 |
| 4   | Mutiara    | 3 | 120.00| 7 | 114.00 |
| 5   | Padang Unoi| 2 | 118.00| 5 | 116.00 |
| 6   | Karya Bakti| 4 | 116.25| 1 | 115.25 |
| 7   | Tamon Jaya | 2 | 119.00| 1 | 113.00 |
| 8   | Meunafa    | 2 | 117.00| 1 | 112.00 |
| 9   | Jaya Baru  | 2 | 121.00| 1 | 114.00 |
| 10  | Tameng     | 2 | 115.00| 1 | 113.25 |
|     | Total      | 25 | 1180.50| 25 | 1143.18|
|     | Average    | 118.05±1.40 | 114.32±1.07 |

The results of this study are almost the same as the height of the buffalo hips studied by [5] in the Gunung Tua and Binanga areas, namely 119.70 cm and 117.42 cm. However, it is much smaller than the height of the buffalo hips from [9] in Yogyakarta, which is 129.92 cm. According to [6] the
average body size of livestock in an area indicates the quality of available breeds that can be used as a basis for the standard size of breeds in the area.

4. Conclusion
It can be conclude that the average body measurements of the Simeulue buffalo in Salang sub district, Simeulue district are classified as medium size both male and female. The body sizes of the male Simeulue buffalo are larger than those of the female Simeulue buffalo. The average body size of Simeulue buffalo in Salang sub-district, Simeulue district is not much different from the body size of several types of buffalo outside Simeulue Island.

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