The Identification of quantitative traits of Aceh cattle in Aceh Besar District of Aceh Province, Indonesia

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Abstract. The purpose of this study was to identify the quantitative traits of Aceh cattle in Aceh Besar district of Aceh Province. The reason was because the lack of quantitative traits data of Aceh cattle. This research used survey method in two sub districts within Aceh Besar district, namely: Ingin Jaya sub district and Lembah Seulawah sub district. The material consisted of 84 Aceh cattle, 40 from Ingin Jaya sub district and 44 from Lembah Seulawah sub district. The determination of cattle samples was done by simple random sampling method. The data collected data were analyzed using a frequency table, averages, and standard deviations. The parameters observed were: (a) shoulder height; (b) body length; and (c) chest circumference. The results showed that the mean of shoulder height for male and female Aceh cattle in Ingin Jaya sub district were 111.67 ± 3.01 and 107 ± 1.15, body length were 109.33 ± 2.58 and 108.50 ± 0.58, chest circumference were 140.67 ± 3.01 and 138 ± 1.83, respectively. In addition, in Lembah Seulawah sub district, the shoulder height were 107.25± 0.71 and 105.89±1.36, body length were 109.45±0.71 and 107.89±1.36, and chest circumference were 140.50±0.71 and 136.89±1.90, respectively. It could be conclude that the average body measurements of the Aceh cattle were classified as medium size both male and female. The body sizes of the male Aceh cattle were larger than those of the female Aceh cattle.

1. Introduction
Indonesia is known as one of the countries which has a diversity of animal genetic resources. Some local cattle breeds have been known in Indonesia, including Bali cattle, Pesisir cattle, Kuantan cattle, Katingan cattle [1] and PO cattle. Aceh cattle is one of genetic resources of Indonesia local cattle families which has an original geographical distribution in Aceh Province, and has been cultivated hereditary, which has been determined based on the Ministry of Agriculture's decision number: 2907 / Kpts / OT. 140/6/2011 dated June 17, 2011, that Aceh cattle have a variety of shapes, physical and genetic composition and good adaptability to environmental limitations. Therefore, they needs to be protected and preserved. Based on the research of mtDNA D-Loop region. Aceh cattle have a closest relationship to Bos indicus and have been influenced by Bos taurus [2]. Quality improvement of Aceh cattle need to be done genetically to increase the productivity of local livestock in Indonesia. One of them can be done by improving genetic aspects through crossing and selection. Selection in cattle can be done based on genotype and phenotype diversity. Phenotype diversity of quantitative traits can be measured through some body measurements such as body weight, body length, chest circumference, shoulder height, hip height. According to [3] and [4], body measurements are able to
describe the characteristics of the breed. This study aims to determine the diversity of the quantitative traits of Aceh cattle.

2. Materials and Methods
This study utilized a survey method by measuring directly the Aceh cattle which would be used as research sample. The selection of the location of this study was done purposively (purposive sampling) with consideration of the districts that had the largest Aceh cattle population in Ingin Jaya and Lembah Seulawah sub district. The determination of Aceh cattle samples was done by simple random sampling method. The parameters observed included: (a) shoulder height; (b) body length; and (c) chest circumference. The measurement process was conducted according to [5]. The data collected were analyzed using a frequency table, averages, and standard deviations [6]. The data obtained were processed and then descended and described descriptively.

3. Results and Discussion
3.1. 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 the animals. Aceh cattle shoulder height in Ingin Jaya dan Lembah Seulawah sub district can be seen in Table 1.

| No. | Sub district    | Shoulder Height (cm) (n) | Male  | Female |
|-----|-----------------|--------------------------|-------|--------|
| 1   | Ingin Jaya      | 6                        | 111.67±3.01 | 107.00±1.15 |
| 2   | Lembah Seulawah | 2                        | 107.25±0.71  | 105.89±1.36  |

Note: (n) = number of Aceh cattle samples

The average size of male Aceh cattle shoulder height is higher than the average shoulder height of female Aceh cattle. [7] stated that the average shoulder height of an adult Aceh cattle is significantly different (P<0.05) from female adult cattle, 101.50 cm and 99.19 cm, respectively. Shoulder height increases markedly with increasing age. The average shoulder height of female Kuantan cattle is higher than male Kuantan cattle, 96.57±7.25 and 91.67±4.16, respectively [8]

3.2. The body length
The average body length has a very important role in determining the body weight of ruminants like cattle. The body length of the Aceh cattle in Ingin Jaya and Lembah Seulawah sub district is shown in Table 2.

| No. | Sub district    | Body length (cm) (n) | Male  | Female |
|-----|-----------------|----------------------|-------|--------|
| 1   | Ingin Jaya      | 6                    | 109.33±2.58 | 108.50±0.58 |
| 2   | Lembah Seulawah | 2                    | 109.45±0.71  | 107.89±1.36  |

Note: (n) = number of Aceh cattle samples

According to [7], the average body length of male adult cattle (103.61cm) is relatively larger than female adult cattle (102.91 cm), but it is not statistically significant. [8] reports that the body length of male Kuantan cattle is smaller than the female, 96.28±10.70 and 85.67±4.04, respectively.

3.3. Chest circumference
Many body measurements are associated with body weight. [9] states that chest size is always a parameter determining body weight in each equation estimating body weight, even being the main
parameter. The results of Aceh cattle chest circumference measurements in Ingin Jaya and Lembah Seulawah sub district are shown in Table 3.

Table 3. The average chest circumference Aceh cattle

| No. | Sub district       | Chest circumference (cm) |   |   |
|-----|-------------------|--------------------------|---|---|
|     |                   | (n)                      | Male   | Female |
| 1   | Ingin Jaya        | 6                        | 140.67±3.01 | 138.00±1.83 |
| 2   | Lembah Seulawah   | 2                        | 140.50±0.71 | 136.89±1.90 |

Note: (n) = number of Aceh cattle samples

The average chest circumference of male Aceh cattle is bigger than the size of the female Aceh cattle. [8] reports that the chest circumference of male Kuantan cattle is smaller than the female, 120.71±12.53 and 108.33±14.43, respectively, while [10] state that chest circumference of Bali cattle in male and female are 136.69 ± 14.57 and 146.84 ± 13.18, respectively. According to [7] the mean chest circumference of adult male cattle (135.25cm) are significantly different (P <0.01) from female cattle (128.52 cm). Likewise, the width of the chest of the adult male Aceh cattle (27.00 cm) are significantly different (P <0.01) with female Aceh cattle (24.21 cm). As cattle age, the chest circumference and chest width increase significantly (P <0.01).

4. Conclusion

It can be concluded that the average body measurements of the Aceh cattle, both male and female, in Ingin Jaya and Lembah Seulawah sub districts are classified as medium size. The body sizes of the male Aceh cattle are larger than the female Aceh cattle. The average body size of Aceh cattle in Ingin Jaya and Lembah Seulawah sub districts is not much different from the body size of several types of cattle outside the Aceh Province.

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