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# Identification of determining factors size and shape Simbal cattle and Brahman Cross cattle in Pamenang Barat Merangin district

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**ABSTRACT:** This study aims to determine the determinants of size and shape of Simbal and Brahman Cross cattle in the West Pamenang sub-district, Merangin district. The method of this study was a survey with a purposive sampling technique. Sampling criteria included: Sample of each breeds consisted of 60 Simbal and 60 Brahman Cross cattle aged 1-2 years. Data observed included: body length, shoulder height, chest circumference, inside chest, chest width, canon circumference, hip height, body weight, and body weight gain. The differences in body measurements between Simbal and Brahman Cross cattle analyzed by T-test. Identification of the determinants of size and shape of Simbal and Brahman Cross cattle were analyzed using Main Component Analysis method. The results of this study were body weight, body weight gain, and body measurements of Simbal cattle were significantly different ($P < 0.05$) higher than Brahman Cross cattle, both male and female. Simbal cattle and male Brahman Cross cattle were significantly different ($P < 0.05$) higher than females. The conclusion shows that body weight, body weight gain, and body measurements of Simbal cattle are higher than Brahman Cross cattle. Male body weight gain was higher than females in both Simbal and Brahman Cross cattle. The determining factor for the body size of Simbal and Brahman Cross cattle is chest circumference, while the determining factor for body shape of Simbal cattle is the height of shoulders, while Brahman Cross is body length. The highest correlation between body measurements and body weight in Simbal and Brahman Cross cattle, both male and femal is chest circumference (LD).

**Keywords:** Body weight; Body weight gain; Body measurements.

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## INTRODUCTION

Indonesia is an agricultural country that has abundant natural resources and still relies on the agricultural sector. The agricultural sector is further divided into several sub-sectors, one of which is the livestock sub-sector. One of the livestock sub-sectors that have the potential to be developed is cattle. However, the increase in cattle population tends to be slow and not in line with demand. The need for cattle in 2016 reached 674,690 tons. Until now, the domestic production capacity is only 441,761 tons, so a shortage of 232,929 tons must be imported (Ihza, 2017). National cattle production in 2018 reached 496 thousand tons. On the other hand, in 2018 Indonesia imported about 160 thousand tons of cattle (Indonesian Central Bureau of Statistics, 2019).

The Government of the Republic of Indonesia attempts to reduce the value of imports, so the government has imported new blood, such as the Brahman Cross and Simmental cattle. Brahman Cross cattle are imported directly from Australia (Muslim et al., 2013), while Simmental cattle are in the feeder form and some are also in the form of frozen semen. In Jambi Province, one of the development areas for Brahman Cross cattle and Simmental crosses with Balinese cattle through IB is in Pamenang Barat sub-district, Merangin district. The distribution area for Brahman Cross cattle is in the West Pamenang sub-district and in this sub-district, a cross between Simmental and Bali cattle is also carried out.

Until now, the productivity level of Simbal and Brahman Cross cattle in this area has not been widely known. One of the efforts that can be made to obtain information about the productivity of Simbal and Brahman Cross cattle is by identifying quantitative characteristics. Quantitative characteristics are properties that can be measured but cannot be distinguished from others (Wahyuni et al., 2016). Characterization of quantitative characteristics is important in order to develop a cattle breed, which can be seen from body weight, body weight gain and body measurements (Heryani et al., 2018).

Phenotypic diversity of Simbal and Brahman Cross cattle can be observed through observation and measurement of quantitative characteristics through analysis of body measurements. Identification of body size can be carried out using the Main Component Analysis (AKU) approach by determining size characteristics that are more influenced by environmental factors and shape is more influenced by genetic factors. This information is essential in providing basic information about the characteristics or characteristics of a breed of cattle. Body size determines the performance of the cattle itself and determines the conditions for its descent. In addition, it can be used as a standard for assessing the productivity of cattle, where body measurements can provide an overview of the performance (exterior) of livestock and determine the live weight and serve as basic guidelines for selection in livestock breeding programs. Based on that, it is necessary to research "Identification of Determinants of Size and Shape of Simbal and Brahman Cross Cattle in Pamenang Barat Sub-District, Merangin District".

## MATERIALS AND METHODS

This research was conducted in Pemenang Barat sub-district, Merangin district, which took place from February 19, 2020, to March 19, 2020. The materials of this study were Simbal cattle and Brahman Cross. The equipment used is stationery, measuring sticks, measuring tapes, digital scales, and digital cameras. The method used in this study was a survey with a purposive sampling technique. Sampling criteria included: The sample from each breed consisted of 60 Simbal cattle and 60 Brahman Cross cattle aged 1-2 years. The data observed included: body length, shoulder height, chest circumference, inside chest, chest width, canon circumference, hip height, body weight and weight gain.

**Data Analysis**

The data that has been collected were grouped based on male and female sex on Simbal and Brahman Cross cattle. The distinguishing factors between the two breeds include: PB, TP, LD, DD, LeD, LK, TPi, analyzed using the Gaspersz average difference test (t-test) Gaspersz, (2006), with the following formula;

$$t = \frac{\overline{X}_1 - \overline{X}_2}{\sqrt{\frac{\sum(X_{J1} - \overline{X}_1)^2}{n_1(n_1 - 1)} + \frac{\sum(X_{J2} - \overline{X}_2)^2}{n_2(n_2 - 1)}}}$$

Information:

t = value of t count
$\overline{X}\,i$ = sample mean in the first group,
$\overline{X}_2$ = sample mean in the second group,
$X_{j1}$ = the value of the J observation in the first group
$X_{j2}$ = the value of the Jth observation in the second group
$n_1$ = number of samples in the first group, and
$n_2$ = number of samples in the second group

Furthermore, the data was corrected from male to female. The goal is to eliminate one of the distinguishing factors between the samples, namely the gender data. The corrected data will be combined with the male cattle data, so that the parameters compared in the sample of this study are only between Simbal and Brahman Crossbreeds. The formula used for data correction following Depison (2010) research is as follows:

$R = \frac{\bar{x}i}{\bar{x}j}$ Then $K = R\ .\ (x_{1.1j}, x_{1.2j}, \ldots x_{n.nj})$

Information:

K = Correction
R = Average between sexes

Principal Component Analysis was used to find the determining factors for the size and shape of the Simbal and Brahman Cross cattle through the body measurements according to the instructions (Gaspersz, 2006) with the following mathematical model:

$$Yj = a_{1j}X_1 + a_{2j}X_2 + a_{3j}X_3 + \ldots\ldots + a_{7j}X$$

Information:

$Y_j$ = the j principal component ( j = 1, 2; 1 = size, 2 = shape )
$X_{1,2,3\ldots}$ = variable to 1,2,3….7
$a_{ij,2j,3j,\ldots}$ = the i variable eigenvector (1,2,3,….7) and the j principal component

Regression analysis was used to see the relationship between body measurements and bodyweight of the Simbal and Brahman Cross cattle according to Gaspersz, (2006) with the following regression model:

$$Y= b_0+b_1X_1+b_2X_2+b_3X_3+\ldots\ldots +b_{19}X_{18}$$

Information:
Y = Body weight
$b_0$ = Constant
$b_1$ = Regression coefficient of body length ($X_1$)
$b_2$ = Regression coefficient of shoulder height ($X_2$)
$b_3$ = Regression coefficient of bust ($X_3$)
$b_4$ = Regression coefficient of inside chest ($X_4$)
$b_5$ = Regression coefficient of width chest ($X_5$)
$b_6$ = Regression coefficient of canon circumference ($X_6$)
$b_7$ = Regression coefficient of hip height ($X_7$)

The correlation between body measurements and body weight of the Simbal and Brahman Cross cattle is calculated based on the instructions Gaspersz, (2006) with the following formula:

$$r_{xy} = \frac{n\sum x_i y_i - (\sum x_i)(\sum y_i)}{\sqrt{\{n\sum x_1^2 - (\sum x_i)^2\}\{n\sum y_2^1 - (\sum y_i)^2\}}}$$

Information: $r_{xy}$= Pearson Correlation
x = Body measurements
y = Body weight

Data processing is assisted by using statistical software, namely Minitab version 18.

## RESULT AND DISCUSSION

### Body weight and body weight gain Simbal cattle and Brahma cross cattle

Body weight and body weight gain of Simbal and Brahman Cross male and female cattle can be seen in Table 1. Based on table 1, The body weight of the research results, compared to several studies is not much different, the body weight of male Simbal is 379.88 ± 49.14 kg and female 350.03 ± 31.40 kg (Zafitra et al., 2020). Male simbal 373.73 ± 29.42 kg and female Simbal 340.11 ± 25.75 kg (Siska et al., 2020). The results of this study are not much different from those of Hamdani et al. (2018) which states that the average body weight of BX Cattle on people's farms is 271.12 ± 26.03 kg and in commercial companies is 383.92 ± 35.05 kg.

Furthermore, according to Rasyid et al. (2016) the average body weight of BX cattle aged> 12-15 is 128.1 ± 8.79 kg 128.1 ± 8.79 kg > 15-18 months is 164.0 ± 9.40 kg, age> 18-21 months 179.2 ± 11.0 kg and> 21-24 month is 219.6 ± 13.1 kg. The difference test results in the average body weight and body weight gain of Simbal cattle are significantly different (P <0.05) higher than the Brahman Cross cattle, both male and female. Simbal cattle and male Brahman Cross cattle were significantly different (P <0.05) higher than female.

Simbal shows better body weight appearance and weight gain than Brahman Cross cattle. The difference in body weight of Simbal cattle and Brahman Cross cattle is thought to be due to differences in nationality between Simbal (Simental x Bali) cattle and Brahman Cross cattle. According to Depison, (2010), crossing of Balinese cattle with Simental produced better offspring than crosses of Balinese cattle with Limousin, Brahman and PO in terms of weaning weight, one year age weight and livestock body size. The body weight gain of Simbal and Brahman Cross male cattle is greater than body weight gain of Simbal and Brahman Cross female cattle.

**Table 1.** Average body weight and body weight gain for Simbal and Brahman Cross cattle.

| Description | Nation | |
|---|---|---|
| | Simbal cattle | Brahman *Cross* cattle |
| Body Weight (BW) | | |
| Male (kg) | 372,45 ± 33,00[a] | 298,41 ± 38,72[b] |
| Female (kg) | 348,68 ± 29,30[a] | 274,78 ± 19,98[b] |
| Correction of Females to Males (kg) | 372,45 ± 31,30[a] | 298,41 ± 21,70[b] |
| Body Weight Gain (BWG) | | |
| male (kg/ head/ day) | 0,526 ± 0,072[a]A | 0,340 ± 0,081[b]A |
| female (kg/ head/ day) | 0,404 ± 0,053[a]B | 0,323 ± 0,031[b]B |
| Correction of Females to Males (kg) | 0,526 ± 0,069[a]A | 0,340 ± 0,032[b]B |

Information: Different letters on the same line are significantly different (P <0.05)
Different letters in the same column are significantly different (P <0.0)

**Table 2.** Quantitative characteristics of Simbal and Brahman Cross cattle

| Description | Nation | |
|---|---|---|
| | Simbal | Brahman *Cross* |
| Body Length (BL), cm | | |
| - Male | 135,93 ± 6,20[a] | 130,83 ± 6,47[b] |
| - Female | 130,80 ± 6,38[a] | 125,06 ± 4,40[b] |
| - Correction of Females to Males | 135,93 ± 6,63[a] | 130,83 ± 4,46[b] |
| Shoulder Height (SH), cm | | |
| - Male | 126,26 ± 5,00[a] | 124,90 ± 7,13[b] |
| - Female | 121,60 ± 4,02[a] | 118,60 ± 2,66[b] |
| - Correction of Females to Males | 126,26 ± 4,17[a] | 124,90 ± 2,80[b] |
| Chest Circumference (ChC), cm | | |
| - Male | 163,46 ± 7,75[a] | 154,66 ± 7,58[b] |
| - Female | 158,93 ± 9,61[a] | 149,86 ± 5,95[b] |
| - Correction of Females to Males | 163,46 ± 9,88[a] | 154,66 ± 6,14[b] |
| Inside Chest (IC), cm | | |
| - Male | 51,63 ± 3,57[a] | 48,10 ± 3,59[b] |
| - Female | 49,73 ± 3,53[a] | 45,26 ± 2,98[b] |
| - Correction of Females to Males | 51,63 ± 3,66[a] | 48,10 ± 3,16[b] |
| Chest Width (CW), cm | | |
| - Male | 44,53 ± 3,69[a] | 38,26 ± 2,18[b] |
| - Female | 40,33 ± 2,96[a] | 33,73 ± 1,48[b] |
| - Correction of Females to Males | 44,53 ± 3,27[a] | 38,26 ± 1,68[b] |
| Canon Circumference (CaC), cm | | |
| - Male | 20,01 ± 1,30[a] | 17,76 ± 1,10[b] |
| - Female | 18,86 ± 1,99[a] | 16,66 ± 0,99[b] |
| - Correction of Females to Males | 20,01 ± 2,11[a] | 17,76 ± 1,05[b] |
| Hip Height (HH), cm | | |
| - Male | 129,43 ± 4,32[a] | 127,10 ± 6,26[b] |
| - Female | 126,36 ± 4,08[a] | 120,70 ± 2,79[b] |
| - Correction of Females to Males | 129,43 ± 4,18[a] | 127,10 ± 2,94[b] |

Information: Different letters on the same line are significantly different (P <0.05)

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The results showed that the difference in body weight gain between male and female Simbal and Brahman Cross cattle is thought to be due to the fact that male cattle have a greater ability to eat than female cattle, and male cattle have a faster growth rate than female cattle. Following the opinion of Hamdani et al. (2017), which states that male cattle grow faster than female cattle and are heavier at the same age. Furthermore, faster growth occurs in male cattle compared to female livestock due to the presence of the steroid hormone testosterone produced by the testes (Setiyono et al., 2017).

**Body measurements of Simbal cattle and Brahman cross cattle**

Body measurements of Simbal cattle and Brahman cross cattle can be seen in Table 2. Based on table 2. That the results of the analysis of average difference test body sizes of Simbal cattle for both male, female and female to male correction are significantly different ($P < 0.05$) with Brahman Cross cattle. The body measurements of the Simbal cattle are higher than the body measurements of the Brahman Cross. This difference is thought to be due to the influence of genetic factors between the two breeds of cattle. According to Hikmawaty et al. (2014) body size of livestock can differ from one another due to genetic potential, location of origin, rearing and mating systems applied in the area. One of the factors that causes differences in body sizes is genetics (Gunawan and Putera, 2016), the interaction of genetic factors and environmental factors will affect the growth of a livestock breed (Rastosari et al., 2014).

These factors cause the performance of livestock to vary from one nation to another. Simmental is one of the males that has a high enough effect on the growth of calves produced (Susanti et al., 2015). Depison (2010) explains that crossing Simmental, Ongole, Brahman and Limousin cattle with Balinese cattle can improve the genetic quality of their offspring and the best breed is the result of the marriage of Simmental males and Balinese cattle.

**Coefficient of variability of body sizes of Simbal and Brahman cross cattle**

The coefficient of diversity is the diversity between populations, where the higher the level of diversity, the more diverse the population is. The coefficient of variability in body sizes of the Simbal and Brahman Cross cattle can be seen in table 3. Based on table 3. that the coefficient of variability of body weight, body weight gain, shoulder height, chest circumference, inside chest, canon circumference, and hip height for male and female Simbal cattle ranges from 1.0% - 13.7% while in Brahman Cross cattle between 2.2% - 23 , 9%. The highest coefficient of the diversity of all body sizes in both Simbal and Brahman Cross cattle is body weight gain. This means that the body weight gain has the highest diversity of all observed variables so that the body weight gain selection is possible.

**The determinants of the size and shape of the Simbal and Brahman cross cattle.**

The determinants of size, shape determinants, total diversity, and eigenvalues of Simbal cattle and Brahman Cross cattle can be seen in Table 4. Based on table 4. The equation of the female to male correction score, the body size of Simbal cattle and Brahman Cross cattle has a total diversity of 88% and 88.6%, respectively. This percentage is the largest proportion of diversity among the main components obtained. The highest eigenvector obtained in the equation for the size of the Simbal cattle and the Brahman Cross cattle is the chest circumference.

These results indicate that chest circumference can be used as a determinant of size because it has the greatest contribution to the size equation. While the determinant of the body shape of the Simbal cattle is shoulder height and the determinant of the body shape of the Brahman Cross cattle is body length. The increase in shoulder height and body length in female Simbal and Brahman Cross will increase the body shape score. The results of this study are following the opinion of Gunawan and Putera, (2016) that chest circumference

shows the highest correlation with body weight. According to Aguantara et al. (2019), chest circumference is the highest correlation because it is directly related to the chest and abdominal space. Most of the livestock body weight comes from the chest to the hips. This means the greater size of the chest circumference of the livestock, the greater the body weight or heavier. Furthermore, Ni'am et al. (2012) stated that chest circumference at each age has a better closeness to body weight when compared to shoulder height, body length and chest width at the same age.

**Table 3.** Coefficient of diversity (%) body sizes of Simbal and Brahman Cross cattle.

| Variable | Coefficient of Diversity (%) | |
|---|---|---|
| | Simbal | Brahman *Cross* |
| Body Weight (BW) | | |
| Male | 8,8 | 12,9 |
| Female | 8,4 | 7,2 |
| Correction of Females to Males | 8,4 | 7,2 |
| Body Weight Gain (BWG) | | |
| Male | 13,7 | 23,9 |
| Female | 13,2 | 9,6 |
| Correction of Females to Males | 13,2 | 9,6 |
| Body Length (BL) | | |
| Male | 4,5 | 4,9 |
| Female | 4,8 | 3,5 |
| Correction of Females to Males | 4,8 | 3,5 |
| Shoulder Height (SH) | | |
| Male | 3,9 | 5,7 |
| Female | 3,3 | 2,2 |
| Correction of Females to Males | 3,3 | 2,2 |
| Chest Circumference (ChC) | | |
| Male | 4,7 | 4,9 |
| Female | 6,0 | 3,9 |
| Correction of Females to Males | 6,0 | 3,9 |
| Inside Chest (IC) | | |
| Male | 6,9 | 7,4 |
| Female | 7,1 | 6,5 |
| Correction of Females to Males | 7,1 | 6,5 |
| Chest Width (CW) | | |
| Male | 8,2 | 6,5 |
| Female | 7,3 | 4,3 |
| Correction of Females to Males | 7,3 | 4,3 |
| Canon Circumference (CaC) | | |
| Male | 6,5 | 6,2 |
| Female | 1,0 | 5,9 |
| Correction of Females to Males | 1,0 | 5,9 |
| Hip Height (HH) | | |
| Male | 3,3 | 4,9 |
| Female | 3,2 | 2,3 |
| Correction of Females to Males | 3,2 | 2,3 |

**Table 4.** Determinants of the size and shape of the Simbal cattle and the combined female to male Brahman Cross cattle.

| Description | | Equation | KT (%) | Λ |
|---|---|---|---|---|
| Simbal | Body Size Equation | = 0,388 BL + 0,366 SH + **0,395 ChC** + 0,363 ID + 0,370 CW + 0,389 CaC + 0,375 HH | 88 | 6,158 |
| | Body Shape Equation | = -0,227 BL + **0,413 SH** + 0,221 ChC - 0,811 ID + 0,046 CW + 0,251 CaC + 0,079 HH | 3,6 | 0,2529 |
| Brahman *Cross* | Body Size Equation | = 0,393 BL + 0,394 SH + **0,396 ChC** + 0,394 ID + 0,384 CW + 0,279 CaC + 0,391 HH | 88,6 | 6,2016 |
| | Body Shape Equation | = **0,177 BL** + 0,131 SH + 0,085 ChC + 0,104 ID + 0,027 CW - 0,954 CaC + 0,154 HH | 14,5 | 1,1572 |

Information: BL = Body Length, SH = Shoulder Height, ChC = Chest Circumference, ID = Inside Chest, CW = Chest Width, CaC = Canon Circumference, HH = Hip Height, TD = Total Diversity, λ = eigenvalues

**Regression of body measurements with body weight of Simbal cattle and Brahman cross cattle**

Regression analysis showed that the body measurements of the Simbal and Brahman Cross cattle had a significant effect ($P < 0.05$) on body weight. This means that body size is related to body weight. The size of the body measurements will affect body weight. The regression equation for Simbal cattle and Brahman Cross cattle can be presented in Table 5.

Table 5. This shows that the relationship between partial body size and body weight is positive. This means that with every increase in body size, body weight will also increase. This is in accordance with Ikhsanuddin et al, (2018) that every 1 cm increase in body measurements will impact increasing body weight according to the coefficient value. This study indicates that body size has a positive relationship with body weight, where any increase in body size will cause an increase in body weight.

**Correlation of body measurements with body weight of Simbal cattle and Brahman cross cattle**

The correlation between body sizes and body weight (the result of combining female to male) in Simbal and Brahman Cross cattle can be seen in Table 6.

Based on Table 6, the simultaneous closeness of the relationship between body measurements and body weight of Simbal and Brahman Cross cattle are 0.960 and 0.942, respectively. The coefficient of determination ($r^2$) between body size and body weight of Simbal and Brahman Cross cattle are 0.922 and 0.889, respectively. This determination value indicates that body measurements determine 92.2% of body weight in Simbal cattle while the rest is caused by other unobserved factors, while in Brahman Cross cattle 88.9% of body weight is determined by body measurements, whereas it is influenced by other factors that were not observed.

The highest correlation value between body size and body weight of Simbal and Brahman Cross cattle is chest circumference. This study indicates that chest circumference can be used to estimate the body weight of Simbal and Brahman Cross cattle. According to Ni'am et al. (2012), the highest correlation between body weight and body measurements is chest circumference. Then Aguantara et al. (2019) stated that chest circumference has the highest correlation coefficient with body

weight followed by height and body length. The closeness of the relationship between chest circumference and body weight is thought to be because chest circumference is the largest body size compared to other body measurements.

**Table 5.** The regression equation of body measurements with body weight (female to male correction) in Simbal and Brahman Cross cattle

| Nation | Variable | Equation |
|---|---|---|
| Simbal cattle | General | = 6 + 1.29 BL - 0.33 SH + 0.68 ChC + 1.85 ID - 0.56 CW + 5.28 CaC - 0.424 HH |
| | BL | BW = -212.0 + 4.300 BL |
| | HH | BW = -404 + 6.149 HH |
| | ChC | BW = -104.0 + 2.914 ChC |
| | ID | BW = -5.9 + 7.328 ID |
| | CW | BW = 19.4 + 7.93 CW |
| | CaC | BW = 100.8 + 13.57 CaC |
| | HH | BW = 845 - 3.72 HH |
| Brahman Cross cattle | General | BW = -351 - 0.381 BL + 1.71 SH + 1.15 Chc - 0.37 ID + 3.99 CW + 3.25 CaC + 0.91 HH |
| | BL | BW = -78.6 + 2.881 BL |
| | HH | BW = -572.7 + 6.975 HH |
| | ChC | BW = -211.7 + 3.298 ChC |
| | ID | BW = -6.4 + 6.336 ID |
| | CW | BW = -159.5 + 11.966 CW |
| | CaC | BW = 20.7 + 15.63 CaC |
| | HH | BW = -553.4 + 6.702 HH |

Information: BW = Body Weight, BL = Body Length, SH = Shoulder Height, ChC = Chest Circumference, ID = Inside Chest, CW = Chest Width, CaC = Canon Circumference, HH = Hip Heigh

**Table 6.** Correlation of body measurements with body weight (combined female to male) in Simbal and Brahman Cross cattle

| Variable | Nation | | | |
|---|---|---|---|---|
| | Simbal | | Brahman *Cross* | |
| | R | $r^2$ | r | $r^2$ |
| Simultaneous | 0,960 | 0,922 | 0,942 | 0,889 |
| Body Length VS BW | 0,912 | 0,831 | 0,611 | 0,373 |
| Shoulder Height VS BW | 0,820 | 0,672 | 0,900 | 0,810 |
| Chest Circumference VS BW | 0,920 | 0,846 | 0,934 | 0,872 |
| Inside Chest VS BW | 0,858 | 0,736 | 0,925 | 0,855 |
| Width Chest VS BW | 0,829 | 0,687 | 0,928 | 0,861 |
| Hip Height VS BW | 0,915 | 0,837 | 0,908 | 0,824 |
| Canon Circumference VS BW | 0,918 | 0,842 | 0,763 | 0,582 |

## CONCLUSIONS

The body weight, body weight gain, and body measurements of the Simbal cattle are higher than those of the Brahman Cross. The determining factor for the body size of the Simbal and Brahman Cross cattle is the chest circumference. The determining factor for the body shape of the Simbal cattle is the shoulder height, while the determining factor for the body shape of the Brahman Cross cattle is the body length. The highest correlation between body measurements and body weight of Simbal and Brahman Cross cattle, both male and female is chest circumference.

## REFERENCES


Aguantara, F., Rozi, T., & Maskur. 2019. Morphometric characteristics (linear size & body circle) of Sumbawa X Bali (Sumbal) crossbred cattle that are raised semi-intensively in Sumbawa Regency). *Jurnal Ilmu dan Teknologi Peternak Indonesi*a, *5*(1), 17-26.

Agung, P.P., Ridwan, M., Handrie, Indriawati, F., Saputra, Supraptono, dan Erinaldi. 2014. Morphological profile & genetic distance estimation of cross-breed simmental cattle. *JITV, 19* (2), 112-122. doi:http://dx.doi.org/10.14334/jitv.v19i2.1039.

Badan Pusat Statistik. 2018. Distribusi perdagangan komoditas daging sapi indonesia : Badan Pusat Statstik. Diakses Agustus 16, 2018, dari https://meranginkab.bps.go.id/publication/2018/08/16/4fa4b5695b4e9f1dbde99917/kabupaten-merangin-dalam-angka-2018.

Depison. 2010. Bali calf performance hybrid with some of the Bulls In Batanghari District, Jambi Province. Agripet, 10(1), 37-41.

Firdausi, A., Susilawati, T., Nasich, M., & Kuswati. 2012. Pertambahan bobot badan harian sapi brahman *cross* pada bobot badan dan frame size yang berbeda. *Ternak Tropika, 13*(1), 48-62.

Gaspersz, V. 2006. *Teknik Analisis dalam Penelitian Percobaan*. Penerbit Tarsito. Bandung.

Gunawan, A., & Putera, B. W. 2016. Aplikasi linier ukuran tubuh untuk seleksi fenotipik bibit induk sapi po di kabupaten bojonegoro, *Jurnal Ilmu Produksi dan Teknologi Peternak, 4*(3), 375-378.

Hamdani, M.D.I., Adhianto, K., Sulastri, Husni, A. & Renitasari. 2017. Ukuran-ukuran tubuh sapi krui jantan dan betina di kabupaten pesisir barat lampung. *Ilmu Ternak, 17*(2), 97-102.

Hamdani, M.D.I., Husni A., Fajar, M.T., & Sulastri. 2018. Perbandingan performa kuantitatif sapi Brahman cross di peternakan rakyat dengan di perusahaan komersial pada umur 18-24 bulan. *Jurnal Ilmu dan Teknologi Peternakan Tropis*. 5, (3), 25-30. doi: http://dx.doi.org/10.33772/jitro.v5i3.4721

Hartati, Sumadi, Subandriyo, & Hartatik, T. 2010. Keragaman morfologi dan diferensiasi genetik sapi peranakan ongole di peternakan rakyat. *JITV, 15*(1), 72-80.

Heryani, L.G.S.S., N. N. W. Susari, & I.W.N.F. Gunawan. 2018. Variabel komponen utama pada morfometrik sapi putih taro berdasarkan pengukuran badan. *Buletin Veteriner Udayana*. *10*(1), 93-99.

Hikmawaty., Gunawan, A., Noor, R.R., & Jakaria. 2014. Identifikasi ukuran tubuh dan bentuk tubuh sapi bali di beberapa pusat pembibitan melalui pendekatan analisis komponen utama. *Ilmu Produksi dan Teknologi Hasil Peternakan, 02*(1), 231-237.

Ihza, Y. 2017. Pengaruh harga daging sapi internasional, kurs, dan GDP per kapita terhadap impor daging sapi di Indonesia. *Economics Development Analysis Journal, 6 (3)*, 328-345. doi: https://doi.org/10.15294/edaj.v6i3.22282

Ikhsanuddin., Nurgiartinigsih, V. M. A., Uswati., & Zainuddin. 2018. Korelasi ukuran tubuh terhadap bobot badan sapi aceh umur sapih dan umur satu tahun. *Agrifet*. *18*(2), 117-122.

Muslim, K. N., Nugroho, H., & Susilawati, T. 2013. Hubungan antara bobot badan induk dan bobot lahir pedet sapi brahman cross pada jenis kelamin yang berbeda. *Jurnal Ilmu-Ilmu Peternak*. *23*(1), 18-24.

Ni'am, H.U.M., Purnomoadi, A. & Dartosukarno, S. 2012. Hubungan antara ukuran-ukuran tubuh dengan bobot badan sapi bali betina pada berbagai kelompok umur. *Animal Agriculture Journal, 1*(1), 541-556.

Rastosari, A., Sumadi, & Hartatik, T. (2014). Estimasi nilai pemuliaan (np) sapi brahman di BPTU-HPT sembawa. Sumatera Selatan. Proceeding Seminar Brodiversitas v.

Rashid, Md. M., Md. Azharul H., Khan S. H., Abul K. F.H.B. 2016. Prediction of live weight for Brahman crossbred cattle using linear body measurements in rural area. *Advances in Animal & Veterinary Sciences*. 4 (2), 99-106. doi: http://dx.doi.org/10.14737/journal.aavs/2016/4.2.99.106

Setiyono., Kusuma, A, H, A, & Rusman. 2017. Pengaruh bangsa, umur, jenis kelamin terhadap kualitas daging sapi potong di Daerah Istimewa Yogyakarta. *Buletin Peternak, 41*(2), 176-186.

Siska A., Depison & Widodo, E. 2020. Fenotype characteristics Simbal cattles in Merangin District Jambi Province. Journal of Livestock & Animal Health, 3(2), 56-60. https://doi.org/10.32530/jlah.v3i2.256

Soeharsono, Saptati, R. A. & Diwtanto, K. 2011. Produktivitas sapi potong silangan hasil ib dengan ransum berbeda formula. Seminar Nasional Teknologi Peternakan dan Veteriner. Balai Pengkajian

Syafrizal. 2011. Keragaman Genetik Sapi Persilangan Simmental Di Sumatera Barat Teknologi Pertanian Yogyakarta.

Susanti, I., Ihsan, M. N., & Wahjuningsih, S. 2015. Pengaruh bangsa pejantan terhadap pertumbuhan pedet hasil IB di wilayah kecamatan bantur Kabupaten Malang. *Ternak Tropika, 16*(1), 41-47.

Wahyuni, V., Nafiu, L. O., & Pagala, M. A. 2016. Karakteristik fenotip sifat kualitatif dan kuantitatif Kambing Kacang Di Kabupaten Muna Barat. *Jitro, 3*(1), 21-30.

Zafitra, A., Gushairiyanto H., Ediyanto, Depison. 2020. Characterization of morphometric & body weight Bali cattle & Simbal in Bangko Merangin district. *Majalah Ilmiah Peternakan*. 23 (2), 66-72. doi: https://doi.org/10.24843/MIP.2020.v23.i02.p04

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