

Bali Cattle Carcass Characteristic of Different Butt Shape Condition

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Abstract

Carcass was main product on cattle slaughtering which contain beef for human consumption and it has high nutritional and economical value. Carcass production on cattle has been influenced by several factors, such as cattle breed, feed, and body conformation. Cattle *Butt Shape* was one of part cattle body conformation which allegedly has have positive correlation on produced carcass. This research was aimed to evaluate *Butt Shape* condition influenced on Bali cattle carcass characteristic. The research was using Bali cattle which slaughter in Kendari Slaughtering House (Rumah Potong Hewan/ RPH - Kendari). The observation includes weighing, and measuring parts of carcass was conducted on 60 heads of *Halal* process slaughtered Bali cattle which traditionally maintained. The research parameters were carcass productivity parameters *i.e.*: slaughtering weight, carcass weight and length, leg length and circumstances. Obtained data were analyzed using Complete Randomized Design and post hoc analyzed using Least Significant Different if have any influence. The research result showed that cattle *Butt Shape* condition have significant ($p < 0,05$) influence on all Bali cattle carcass productivity parameters. Butt shape with B category was result the best carcass productivity compare the others, while C category was better than D. It can be concluded that body and carcass weight were linearly influenced by cattle *butt shape*.

1. Introduction

Cattle classified as good and productive if they can produce optimum carcass quantity and quality. Carcass gained from cattle slaughtering could be indicated the successful of cattle raising process and also showing its meat productivity and corresponding with livestock economical value. Beef cattle was one of protein source which is will always to be needed human in Indonesia and in the world. Based on [1] explained that Indonesia have about 15.419.720 heads beef cattle, which producing beef reach to 506.660 tons and it was the most favoured meat source after poultry.

Cattle productivity increasing can be obtain by combining good raising management on it. The management action program can be applied on initial or end of raising process by evaluating cattle Body Score Condition (BSC), estimating butt shape condition, and calculating meat index, based on that, we can estimating and get the real cattle productivity description.

Cattle grading and classification, especially on carcass, was uncommon and wasn't generally known in Indonesia. It is because majority beef consumer didn't consider about beef quality. Almost all of beef parts were cooked and consumed by the same traditionally methods, include carcass and non carcass (offal). These caused slow development of Indonesian beef industry which create only two market segmentation *i.e.*: (i) traditional local market for middle low economical segment, and (ii) special market for high end segment, restaurant, starred hotel, and franchise store [2]; [3]. Therefore,



we need a rapid and easy doing methods which can estimate carcass composition. Butt Shape score evaluation was one of carcass composition determination method with easy to apply. The evaluation can be held by comparing between cattle butt shape and its standard. Steer which raising by feedlot in Indonesia generally have B to D conformation butt shape score [3]; [4].

Butt Shape was cattle butt plumpness degree, which have function to describe cattle fatness condition and its carcass gaining. Butt shape score for very fat until very lean cattle was A until E respectively. The supreme cattle carcass should be full of meat, with little bones proportion, optimum fat composition, and most of meat [2]. This research be expected can be clearly explain the correlation between butt shape and gained cattle carcass characteristic.

2. Method

This research was conducted on Slaughtering House (Rumah Potong Hewan /RPH) of Kendari City in October 2014 until December 2016. The observation was focused on 40 heads of traditional raising Bali cattle. The research tools which used in this research were knife, body weighing scale, meat weighing scale, and stationary. The research idea scheme was showed below:

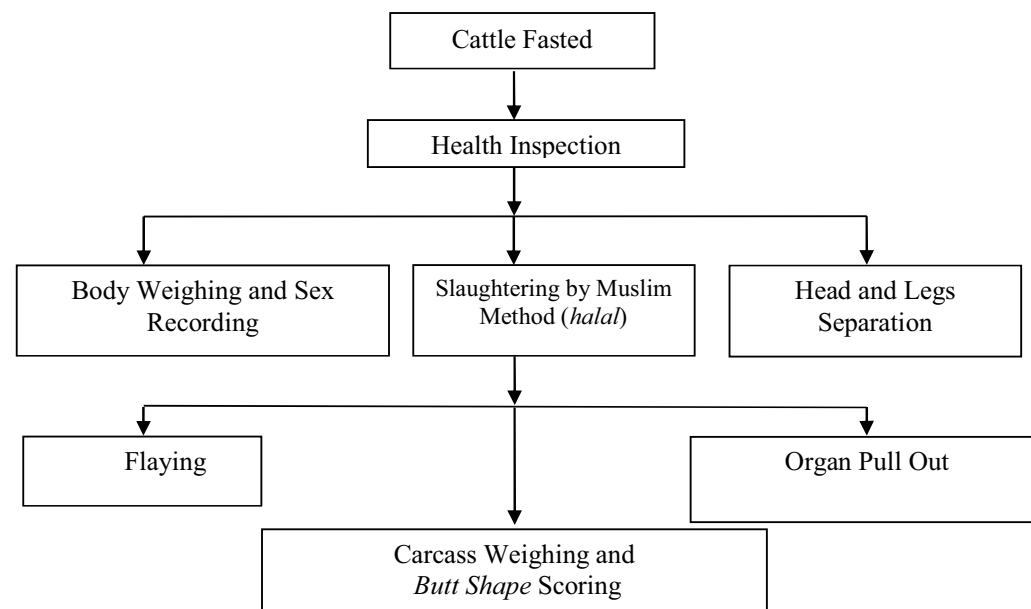


Figure 1. Research Main Idea

An ante mortem inspection applied to make sure those cattle was proper to be slaughtered, continued by cattle body weighing and sexes recording. Cattle slaughtering was held on Muslim method (halal) by cut their carotids' artery, jugulars venous, oesophagus, and trachea to obtain perfect bleeding. The research procedures was design based on [5] methods. Head and legs separation was performed on canon bones joint. Flaying process conducted on floor started by create long slice on chest and abdomen middle line, continuing slicing on medial (legs) section. Leather was separated start from ventral (bottom) to the back part. Organs pull out from abdomen and chest hollow were conducted, except the kidneys. Carcasses parts weighing were held after slaughtering, flaying and evisering process complete, and divide the parts to be has meat, flank, chest, front - rear legs, and totalize all parts to obtain warm carcass weight. The total weight of meat and bone in every part were obtained by separating them. In this research, carcass fat contain unable to determine due of it characteristic (merge on carcass meat) and there was no frozen room facility in slaughtering house.

2.1. Butt Shape Determination

Butt Shape of cattle could be defined by its upper leg conformation and shape. Butt Shape conformation defined as the conformity form of upper leg shape toward over all carcass conformation (skeleton structure, muscle and fat). Butt Shape determinations are useful to describing cattle fatness and its produced carcass. The cattle Butt Shape score presented as A for fatty and E for lean condition [6].

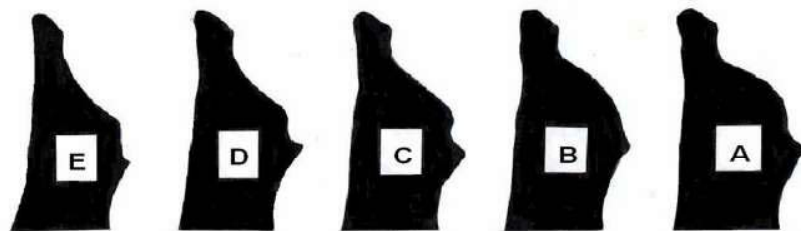


Figure 2. The Illustration of *Butt Shape* Conformation Score [4]

- B. 1. *Butt Shape A* category, very convex
- C. 2. *Butt Shape B* category, convex
- D. 3. *Butt Shape C* category, flat/ average
- E. 4. *Butt Shape D* category, deep-set
- F. 5. *Butt Shape E* category, very deep-set

2.2. The Observed Parameters

1. Slaughtering Weight: the weight of cattle before slaughtered.
2. Carcass Weight: the weight of obtained carcass after slaughtering process.
3. Carcass Length: the measuring of carcass *os scapula* and *os pubis* range after slaughtering process.
4. Upper Leg Circumstance: the measuring of upper leg circumference using ribbon scale
5. Leg Length: the measuring of carcass *os tibia* rear leg and *os pubis* range
6. *Butt Shape* Score: Scoring of butt shape condition based on Upper Leg Circumstance and Leg Length ratio.

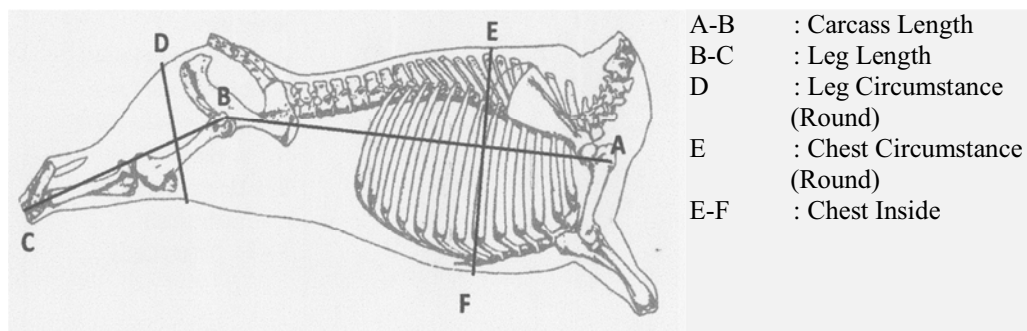


Figure 3. Carcass Measurement Illustration [7]

2.3. Data Analysis

The obtained data were analyzed using Analysis of Variance based on Complete Randomized Design through different replication numbers, and the significantly different were continued analyze using Least Significant Different (LSD) [8] as the models below:

$$Y_{ij} = \mu + T_i + \epsilon_{ij}$$

Explanation:

$i = 1, 2, 3,$

$j = 1, 2, 3, \dots, 18$

Y_{ij} = Observation value of *Butt Shape* and its I^{th} combination and J^{th} replication

μ = Observation value average

T_i = I^{th} Treatment effect

ϵ_{ij} = Error

The post hoc model of LSD:

$$\text{LSD} = q\alpha (p, fe) s \hat{Y}$$

Explanation:

LSD = LSD value on significant α level.

$q\alpha$ = LSD table standard value

P = Treatments number

fe = Error freedom degree

$s \hat{Y}$ = Error mean square

3. Result and Discussion

3.1. Slaughtering and Carcass Weight

Slaughtering Weight was obtained while cattle ready to be slaughtered. The Butt Shape scoring was classified based on cattle's upper leg plumpness condition, which categorized on: A (very plump), B (plump), C (average), D (less plump), and E (poor). The research result showed that there was three Butt Shape categories on Kendari Slaughtering House, which was B, C, and D.

Table 1. The Average of Butt Shape Condition Effect on Carcass Characteristic.

Parameters	Butt Shape Condition		
	B	C	D
Slaughtering Weight (kg)	205.0±69.00 ^{a1}	180.0±40.00 ^{b1}	150.0±20.00 ^{b1}
Carcass Weight (kg)	105.3±34.72 ^{a2}	88.6±19.27 ^{b2}	64.7±6.87 ^{c2}
Carcass Percentage (%)	51.10±3.70 ^{a2}	49.03±2.03 ^{b2}	42.1±1.85 ^{c2}
Carcass Length (cm)	117.0±4.32 ^{ns}	115.0±1.75 ^{ns}	111.0±1.80 ^{ns}
Upper Leg Circumstance (cm)	67.50±1.60 ^{a1}	63.50±4.70 ^{b1}	53.67±1.21 ^{c1}
Leg Length (cm)	59.25±3.50 ^{a1}	55.72±3.20 ^{b1}	54.43±3.10 ^{b1}

- Different superscript on same row showed significance different ¹($p < 0,05$) and ²($p < 0,01$)

- ns: not significance ($p > 0,05$)

Based on research result (Table 1), the cattle Butt Shape categorized as B, C, D were have average slaughtering weight 205.0 ± 69.00 , 180.0 ± 40.00 , and 150.0 ± 20.00 kg respectively. The variance analyses showed that Butt Shape condition have significant influence ($p < 0.05$) on cattle slaughtering weight on Kendari Slaughtering House, which B categorized cattle Butt Shape significantly have higher on slaughtering weight compare with C and D category, meanwhile there was no significant difference between C and D category. There was Butt Shape significant influence ($p < 0.01$) on Bali Cattle carcass weight parameter which slaughtered on Kendari Slaughtering House. The result showed that B Butt Shape categorized cattle have higher carcass weight compare with C and D category, and C was significant higher than D Butt Shape category with the value 105.3 ± 34.72 ; 88.6 ± 19.27 ; and 64.7 ± 6.87 kg respectively. These indicated that slaughtering and carcass weight were increasing linearly based on the increase of cattle Butt Shape condition. Body conformation, such as Butt Shape, was related with body weight, which higher Butt Shape conformation would impact on the increasing of body weight and carcass weight [2]; [6]; [3]; [9].

3.2. Carcass Percentage and Carcass Length

The research result showed that cattle slaughtered on Kendari Slaughtering House, which categorized as B, C, and D Butt Shape condition, have averages carcass weight percentage 51.10 ± 3.70 ; 49.03 ± 2.03 ; $42.1 \pm 1.85\%$ respectively and Butt Shape condition have significant influence ($p < 0.01$) on carcass weight percentage. In contrast with carcass percentage, Butt Shape condition didn't have significant influence ($p > 0.05$) on carcass length. The different Butt Shape conditions have the same carcass length (B: 117.0 ± 4.32 ; C: 115.0 ± 1.75 and D: 111.0 ± 1.80 cm)

Bali cattle with B Butt Shape condition have higher slaughtering weight compare to the others, and this condition also have higher carcass weight percentage. This result was in line [2]; [3]; [9]; [10] which stated that the increasing of slaughtering weight would increase the carcass weight percentage. Higher slaughtering weight would have impact on the increasing of fresh carcass weight, and its percentage. In relation with cattle maturity, the increasing of cattle age should be accordance with the increasing of its body weight, and carcass weight.

There are various factors which have influence on carcass percentage; the main factors were cattle body conformation and fatness degree. Fat cattle should have high carcass weight percentage and generally have thick conformation (beams shaped). Lean/ slim shaped cattle, with long body and neck, have triangle shape (such as dairy cattle), generally have lower carcass weight percentage. The other factors which influenced carcass weight percentage were amount of feed and water on cattle digestion track, if there are so many of them, it could lower carcass weight percentage. Skin size and thickness also influenced carcass weight percentage [9].

3.3. Leg Circumstance and Length

The influence of Butt Shape condition B, C, and D on average Upper Leg Circumstance and Leg Length were (showed on Table 1.) 67.50 ± 1.60 and 59.25 ± 3.50 ; 63.50 ± 4.70 and 55.72 ± 3.20 ; 53.67 ± 1.21 and 54.43 ± 3.10 cm respectively. The variance analysis showed that Upper Leg Circumstance and Leg Length of Bali cattle with B Butt Shape category have significant ($p < 0.05$) higher leg length, Flummness of Leg, and Fleshing Index compare to the other categories. These informed that Butt Shape condition have significant effect on leg circumference of slaughtered Bali cattle in Kendari Slaughtering House, which B Butt Shape category was higher compare with C and D category, and C Butt Shape category was higher than D category. The leg length of Bali cattle categorized as B Butt Shape (59.25 ± 3.50 cm) was have significant higher compare with two other categories, while C (55.72 ± 3.20 cm) and D (54.43 ± 3.10 cm) category was not significant different.

On living cattle, butt plumpness degree can be estimated using Butt Shape conformation or its leg shape. Butt Shape conformation defined as the conformity form of upper leg shape toward over all carcass conformation, involved skeleton, muscle and fatty [4]. There is some interesting case about the

measurement method which nothing useful indication from using Butt Shape condition to estimated its produced and marketed beef although Butt Shape conditions generally choose as carcass marketing because of economical benefit. The A, B, and D shape score have higher price compare with D and E, with the same carcass weight price difference around US\$ 40 [11].

4. Conclusion

Bali cattle butt plumpness degree (Butt Shape) have significant effect on all its carcass productivity parameters, which B category was better than C or D, while C category was better than D. Linearly, the higher cattle butt plumness would produced higher body and carcass weight, and have higher carcass weight percentage.

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