Correlation between the Slaughter Weight and Carcass Weight of Cattle in Kebumen, Central Java

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ABSTRACT: The experiment was conducted to find out the correlation between the slaughter and carcass weights of cattle (PO, SIMPO, and LIMPO) in Kebumen, Central Java. The materials were 180 cattle (male and female) were divided into three group of age i.e. 0-2.0, 2.5-4.0, and >4.5 years. The sex, age, and breed of cattle were observed before slaughtering. The carcass, meat, bone, and non carcass weights were observed after slaughtering. The data (correlation between slaughter, carcass, meat, bone, and non carcass weights were analyzed using simple and multiple regression analysis and analysis of variance (factorial pattern = 3 breed x 3 age x 2 sex) and the differences between means were tested by Duncan Multiple Range Test. The carcass, meat, bone, and non carcass weights were correlated negatively of PO ($P<0.05$). The slaughter weight were correlated positively with carcass and meat weights but it were correlated negatively with bone and non carcass weights of SIMPO ($P<0.05$). There were showed differences between breed cattle, sex, and age on slaughter, carcass, meat, bone, and non carcass weights ($P<0.05$). There were showed interactions between the breed with sex, sex with age, and breed with sex and age on bone weight, and non carcass weight ($P<0.05$).

Keywords: Correlation, Carcass weight, Body size, Cattle, Kebumen.

INTRODUCTION

Meat demand both on quality and quantity were increased from year to year according with population growth and lifestyle of the people. According to Ensminger (1969) there were three important factors that affect the demand of meat, the factors were: 1) increase of the population; 2) increase of income per capita; and 3) buying power. The increase of basic could affect awareness of the nutritional needs of the family as well as the increase of market living standarts market demand of meat both on quantity and quality. Between the traders of catle and farmer the interpretation of the live weight often only based on experience that might be inaccurate interpretation this estimation way. Based on the description needs to be done conduct the research to find out the relationship between slaughter weight and carcass weight of cattle in Kebumen, Central Java. The experiment was conducted to find out the correlation between the slaughter weight and carcass weight of cattle (PO, SIMPO, and LIMPO) in Kebumen, Central Java. The results of this experiment were expected to give information for breeders, breeding companies, the traders of cattle and goverment to know the relationship between slaughter weight and carcass weight of cattle.

MATERIALS AND METHODS

This experiment was conducted for 4 months starting on July 2014 until October 2014 which was located in slaughterhouse in Kebumen, Central Java. 180 male and female; 30 males of PO, 30 females of PO, 30 males of SIMPO, 30 females of SIMPO, 30 males of LIMPO, and 30 females of LIMPO cattle were use in this experiment. Slaughter weight, Carcass weight, meat

weights, bone weights, and non carcass weights weighed by using the scales. The data were collected in 3 slaughterhouse in Kebumen. The obtained data were tabulated and calculated for the average. Comparison of body size among the breed, sex, and age were analyzed with completely randomized design 3x2x3 factorial.The regression correlation were analyzed by using correlation and simple and multiple linear regression (Dajan, 1974; Sudjana, 1988; Steel and Torrie, 1993), with the carcass weight, the weight of the meat, bone and non carcass weights as the independent variable (X), while slaughter weight of cattle as the dependent variable (Y). Simple and multiple regression analysis stepwise method of used to find the regression equation of the linear model and calculated for the correlation and coefficient of determination to see the influence of independent variables on the dependent variable.

RESULTS AND DISCUSSION

Table 1. Variance, equations, regression correlation and significance coefficient dependent (meat weight) and the independent variable slaughter weight, carcass weight, bone weight, non carcass weight of cattle and PO, SIMPO, and LIMPO.

No.	Variance	Equation	R	Significance
1.	Slaughter weight, carcass weight, bone weight, and non carcass weight of cattle PO	$Y = -22{,}182 + (1.39 \times 10^{-1} \times X_1) + (7.38 \times 10^{-1} \times X_2) + (-8.38 \times 10^{-1} \times X_3) + (2.9 \times 10^{-2} \times X_4)$.	0.920	Significant (P<0.01)
2.	Slaughter weight, carcass weight, bone weight, and non carcass weight of cattle SIMPO	$Y = -24{,}028 + (1.44 \times 10^{-1} \times X_1) + (7.38 \times 10^{-1} \times X_2) + (-8.38 \times 10^{-1} \times X_3) + (2.5 \times 10^{-2} \times X^4)$.	0.921	Significant (P<0.01)
3.	Slaughter weight, carcass weight, bone weight, and non carcass weight of cattle LIMPO	$Y = 148.839 + (2.316 \times X_1) + (-1.12 \times X_2) + (-1.23 \times X_3) + (2.11 \times 10^{-1} \times X_4)$	0.933	Significant (P<0.01)

a. Predictors: (constant), live weight, carcass weight, bone weight, and non carcass weight
b. Dependent variable: weight of meat

Statistical calculations showed highly significant results (P<0.01) and the positive corelation the slaughter weight on three breeds ofsloughter weight was followed by the increasing of carcass, meat, and non carcass weights, with the corelation coefisient (R) was 0,920 and determination coefisient (R^2) was 84.70 for PO cattle; R = 0.921 and R^2 = 84.80 for SIMPO cattle; and R = 0.933 and R^2 = 87.00 for LIMPO cattle. Means the slaughter weight was followed by the carcass, meat, and non carcass weights whit the determination prediction 84% for PO cattle, 84,8% for SIMPO cattle, while 87% for limpo cattle. The negative correlation the slaughter weight with bone weight on cattle PO, SIMPO and LIMPO. The slaughter, carcass, meat, bone and non carcass weights of PO, SIMPO, LIMPO cattle were highly significant different (P<0.01) on the different ages (0-2, 2.5-4, and >4.5 years) and defferent sex (male and female)

The experiment was in agreement with Aberle (2001) reported that the defferent breeds of cattle also influenced significantly on carcass weight because it will cause the defferent on slaughter, carcass, meat, bone, and non carcass weights which cause by the differences of weight gain. Results was obtained Yusuf (2002) which states that the positive correlation between the circumference ofit the chest with the weight cut. Prabowo (2012) stated that the positive correlation

between the weight of meat by carcass weight, slaughter weight. In cattle male SIMPO and LIMPO correlation coefficient between the weight of meat to slaughter weight, carcass weight, and non carcass weights have a very close relationship aimed at the regression coefficients.

Table 2. The average and standard deviation slaughter weight, carcass weight, the weight of the meat, bone weights, and non carcass weight of cattle nations, gender, and age.

Type Cow	Age (years)	Slaughter weights	Carcass weights	Meat Weights	Weight of Bones	Non Carcass Weights
PO	0 – 2.0	380.23±70.71	198.92±52.78	135.27±38.18	153.95±91.01	63.65±24.55
	2,5 – 4.0	484.27±56.65	252.05±45.86	168.07±33.58	82.58±22.57	211.36±29.87
	> 4.5	541.50±28.09	281.58±15.69	191.47±12.78	90.11±17.49	259.92±23.05
SIMPO	0 – 2.0	464.51±70.71	246.19±52.78	167.42±38.18	78.87±91.01	218.32±44.55
	2.5 – 4.0	484.27±56.65	252.05±45.86	168.08±33.58	82.58±22.57	211.36±29.87
	> 4.5	552.78±29.49	298.51±16.57	202.99±13.42	85.52±7.95	254.27±24.43
LIMPO	0 – 2.0	467.12±70.71	256.92±52.78	177.27±38.18	79.65±91.01	210.20±44.55
	2.5 – 4.0	487.78±57.55	254.08±45.89	170.21±32.43	84.91±29.71	210.95±29.96
	> 4.5	568.78±29.49	318.52±16.57	219.78±13.42	99.22± 7.95	250.26±24.43

Results of analysis of variance calculations on the variable carcass weight, the weight of the meat, bone weights, and non carcass weight of cattle were highly significant ($P < 0.01$) in cattle means PO, SIMPO, and had a relatively LIMPO carcass weight, the weight of the meat, bone weights, and non carcass weight were significantly different can be shown in Tables 2, PO cattle have carcass weight, the weight of the meat, bone weights, and non carcass weight was relatively low compared to cows and cattle SIMPO and LIMPO. While the sex and age of highly significant ($P < 0.01$) in carcass weight means, the weight of the meat, bone weights, and non carcass weight of cattle PO, SIMPO, and LIMPO, significantly different between males and females, bulls have a carcass weight, weight meat, bone weights, and non carcass weight were heavier than cows, as well as age 0-2; 2.5-4.0 and >4.5 had a different weight, carcass weight, the weight of the meat, bone weights, and non carcass weight of bulls heavier than a cow, it was supported by slaughter weight and carcass weight steers more heavier than cows. Physiologically carcass weight, the weight of the meat, bone weights, and non carcass weight has a considerable influence on the development of body weight cut because the cattle was supported by the increase in weight gain and will be followed by weight gain carcass so the carcass weight, the weight of the meat, bone weights, and non carcass weight will gain weight as well as carcass weight, the weight of the meat, bone weights, and non carcass weight was the weight of the component pieces of the development were in line with the growth in cattle PO, SIMPO, and LIMPO (Aberle *et al.*, 2001).

CONCLUSION

The slaughter weight, carcass weight, meat weight and non carcass weight were use positively correlated, but it were negatively correlated with bone on PO, SIMPO, and LIMPO cattle. Slaughter weight, carcass Weight, meat weight, bone weight, and non carcass weight of cattle were significant defferent on cattle PO, SIMPO, and LIMPO. There were interaction between the breed with sex, sex with age, breed with age and breed with sex with age on slaughter weight, carcass weight, meat weight, bone weight and non carcass weight.

REFERENCES

Aberle, E. D, J. C Forrest, D. E Gerrard, EW Mills, H. B Heddrick, M. D Judge and R. A Merkel. 2001. Principles of Meat Science, 5th ed. Kendall Hunt Publishing Co. Dubuque. Lowa.

Dajan. 1974. Both volumes. LP3ES, Jakarta.

Ensminger, M. E. 1969. Animal Science. Sixth Edition. The Interstate Printers and Publishers. Inc. Denville. Illiois, USA.

Prabowo, S. 2012. V*ariabel Penduga Bobot Karkas Sapi Simmental Peranakan Ongole Jantan Hidup*. Graduate Thesis UGM, Yogyakarta.

Steel, R. G. D., and H. Torrie. 1993. Principles and Procedures of Statistics. PT Gramedia Pustaka Utama, Jakarta.

Sudjana, D, N. 1976. *Hubungan Antara Lingkar Dada dan Panjang Badan dengan Bobot Hidup Kerbau Jantan di Muntilan.* Bachelor thesis Ranch. Faculty of Animal Husbandry. UGM, Yogyakarta.

Yusuf, M. 2004. *Hubungan Antara Ukuran Tubuh dengan Bobot Potong Sapi Bali di Daerah Bima NTB.* Thesis. Faculty of Animal Husbandry, Gadjah Mada University, Yogyakarta.