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Estimation of Relationship Between Hot Carcass Weight and *Eye Muscle Area* Which Effects on Meat Production of Black Bengal Goats

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Abstract: A total of 16 castrated male goats were taken to measure hot carcass wt and *eye muscle area* to estimate meat production of goats. These goats were 12 months of age. In this experiment significant (0.1%) correlation was found between Hot carcass wt. and *eye muscle area*.

Key words: Hot carcass wt., *eye muscle area*, meat production

Introduction

Black Bengal goat is the only one livestock breed of Bangladesh. This goat is famous for its meat and skin quality. Chevon as well as goat meat production depends on many parameters but here I have considered only hot carcass wt. and *eye muscle area*. The "eye muscle" area is sometimes used as a predictor of the amount of carcass meat produced from an animal. Fat thickness directly above the greatest depth of the "eye muscle" and the "eye muscle" width and depth are the precise predictor of lean meat, subcutaneous fat and inter muscular fat (Wood *et al*., 1980).Objective of this experiment is to estimate meat production from carcass characteristics.

Materials and Methods

Data were collected from records maintained in the goat breeding project at the Department of Animal Breeding and Genetics, BAU, Mymensingh and the number of castrated male goats were 16. These goats were 12 months of age. Two main traits were considered to predict meat production.

The following parameters were considered for analysis:

a) Hot carcass weight, weight was taken within one hour of slaughter at warm condition.

b) *Eye muscle area*, For measuring *eye muscle area* the hot carcass was split between the 13th and 14th ribs. From the cross section the area was traced five times onto an acetate paper and from the weight-area relationship of the acetate paper the average area of each single 'eye' was estimated.

Eye muscle area (cm^2) = [Weight of acetate paper for total *eye muscle area* / Weight of acetate paper for one cm^2]

The collected data was compiled, tabulated and analyzed in accordance with the objectives of the study. Correlation co-efficient was calculated among the different measurements using the computer program Statgraf (1993). The correlation co-efficient used in Statgraf (1993) was:

$$r_{xy} = \frac{\Sigma(X-\bar{X})(Y-\bar{Y})}{\sqrt{\Sigma(X-\bar{X})^2(Y-\bar{Y})^2}}$$

Where, r_{xy} is the correlation co-efficient, $\bar{x}$ and $\bar{y}$ is the mean of the values of the variable of x and y. Linear, logarithmic models were used for expressing the relationship of two variables. Y= a+bx. Here, a is the intercept and b is the slope usually called the regression co-efficient of y on x. Y is dependent and x is independent variable.

Results and Discussion

The mean of hot carcass weight and *eye muscle area* were 5.82±0.27 kg and 6.50±0.25 cm^2 respectively. These results are in good agreement with Amin *et al*. (2000). Amin *et al*. (2000) found 4.9±0.21 kg hot carcass weight and 5.7±0.20 cm^2 *eye muscle area*.

There was significant correlation ($p<0.01$) between *eye muscle area* and hot carcass weight. Singh *et al*. (1983) and Raghavan (1988) reported that *eye muscle area* was highly associated with hot carcass weight. Hot carcass wt. can be used in estimating *eye muscle area* in goats.

Table 1: Average carcass characteristics in goats

Parameters	Average
Hot carcass weight (kg)	5.82±0.27
Eye muscle area (cm^2)	6.50±0.25

Table 2: Correlation co-efficient of eye-muscle area with hot carcass wt. in goats

Parameter	HCW
EMA	0.91***

EMA, *Eye muscle area*; HCW, Hot carcass weight;
***,Significant at 0.1%.

Table 3: Simple linear regression equation for estimation of eye-muscle area from hot carcass weight with their % reliability

Estimation	Regression equation
EMA from HCW	EMA=1.62+0.84 HCW

HCW, Hot carcass weight; EMA, *Eye muscle area*.

Table 4: Prediction chart for determining *eye muscle area* from hot carcass weight in Black Bengal goats

HCW (kg)	EMA (cm^2)
3.36	4.35
3.75	4.77
4.25	5.14
4.75	5.52
5.00	5.90
5.50	6.28
6.00	6.60
6.25	6.95
6.75	7.32
7.25	7.70
7.50	8.08

HCW = Hot carcass weight, EMA = *Eye muscle area*

Conclusion: In this experiment it is found that *eye muscle area* is highly associated with hot carcass weight. A prediction chart for determining *eye muscle area* from hot carcass weight in Black Bengal goats have been prepared and shown in Table 4. We may consider this positive correlation as selection criteria for selecting goats for meat production.

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