

PHENOTYPE PROFILE OF ONE YEAR BODY WEIGHT AT INDONESIAN LOCAL ETTAWAH GOATS IN FRATERNAL TWINS

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Abstract

The purpose of this study was to describe the phenotypic profile of body weight at one year of male and female came from fraternal twins in Indonesian Local Ettawah Goat (ILEG) or PE Goat. This research method was a case study with data retrieval using purposive sampling with the criteria of male and female fraternal twins. The variables observed were the average and variance of body weight in fraternal twin goats at one year. Data analysed descriptive and unpaired t-test with excel program. The results showed that male goats' body weight at one year of age was significantly ($P < 0.01$) higher than that of female goats at fraternal twins. At one year of age, the body weight variance in male goats was higher than that of female goats at fraternal twins. The conclusion was that the phenotype profile of male ILEG goats was more varied, seen from the average and diversity of body weight, which was 15.37% and 52.24% higher than females. This research implies that feeding male goats should be based on body weight, not on age, to increase their potential optimally.

Keyword: PE Goat, twin, variance, body weight

During the COVID-19 pandemic, which does not yet know when it will end, accompanied by global climate change, which is also uncertain, in the future life, resources are needed that can adapt to environmental changes, including livestock. Livestock that can adapt well to the environment is local and crossbreeds.

Indonesia has the potential to stabilize animal protein foods, seen from the wealth of local livestock and diverse crosses with high adaptability. Based on Kusminanto et al. (2020), the goat breeds that had spread and adapted in Indonesia were the Ettawah Peranakan (PE), Bligon, Kacang, Gembrong, Boer, Borja, Kejobong.

Goat PE or Indonesian Local Ettawah Goat (ILEG) is a breed of goat crossbreeding between local goats and Ettawah, known as an Indonesian livestock breed and widely spread in East Java. ILEG were a dual-purpose type that produced meat and milk and could give birth to twins (Mudawamah et al., 2020), including male and female fraternal twins. On the other hand, so that goat farming was economically profitable if the productivity was high. As livestock that produces meat and milk, an important indicator was the weight of a year old goat. Therefore, it was necessary to examine the phenotype profile of male and female goats resulting from fraternal twins as the basis for feed maintenance management policies to optimise livestock productivity.

Methods

This research was field research that based the data on the actual condition of the existing livestock. The goats that were observed were livestock that was kept in Suruh Subdistrict, Trenggalek Regency. 44 male and female fraternal twins were reared on smallholder farms with the same maintenance system.

The variables observed in this study were the mean, standard deviation (SD), phenotype variation (VP), range, quartile deviation, and mean deviation. The formula of SD, VP, quartile deviation, mean deviation were as follows:

$$sd = \sqrt{\frac{\sum x^2 - (\sum x)^2/n}{n-1}}$$

$$VP = \frac{\sum x^2 - (\sum x)^2/n}{n-1}$$

$$\text{Quartile deviation} = \frac{Q_2 - Q_1}{2}, \text{ where } Q_i = \frac{i}{4}(n+1)$$

$$\text{Mean deviation} = \sum \frac{|X_i - \bar{X}|}{n}$$

Findings and Discussion

The study results of ILEG that had male and female fraternal twins at one year can be seen in Table 1.

Table 1. Phenotype profile of one year body weight at ILEG in fraternal twins

No	Items	One Year of body weight	
		Male	Female
1	Mean (kg)*	41.27 ^b ± 2.25	35.77 ^a ± 1.82
2	VP	5.06	3.33
3	Range (kg)	7	7
4	Quartile deviation (kg)	13	1
5	Mean deviation (kg)	1.85	1.34

* Different notation on the same line was a very significant difference ($P < 0.01$)

Table 1 showed that the average body weight of one-year-old male goats was significantly higher ($P < 0.01$), 15.7% higher than that of female goats, which are genetically both fraternal twins (Figure 1). Following Mathopo et al. (2021), male goat body weight is higher than female cattle. The difference in body weight between males and females is due to the hormones produced (Shi and Clegg, 2009). Male hormones are more directed at muscle growth while female hormones are in fat growth.

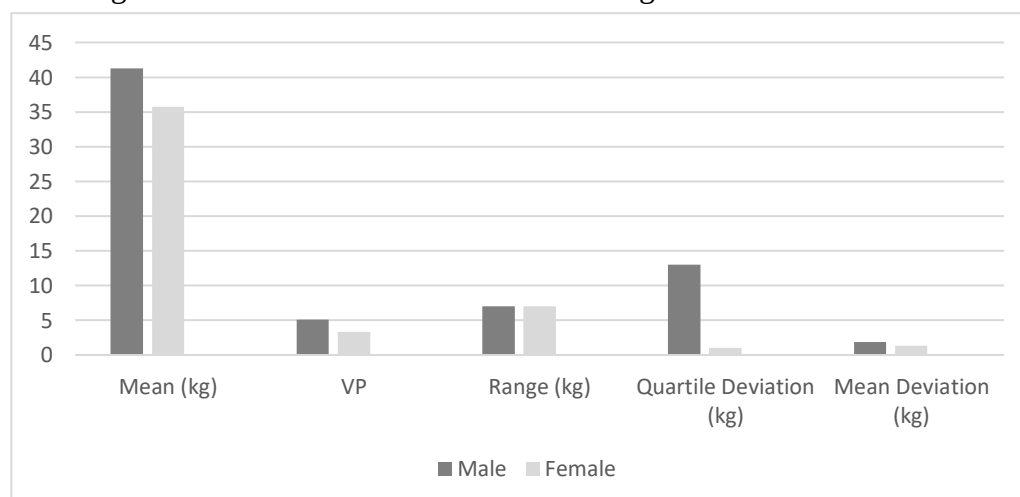


Figure 1. Phenotype profile of one year body weight between female and male ILEG from Fraternal Twins

The comparison value of VP, quartile deviation, and mean deviation showed that the body weight of males at the age of one year varied more 51.95%, 120%, 38% than female goats, except for the same range value (Figure 1). It meant to maximum bodyweight at the age of one year in males goat, should be considered on the individual feed requirements of males compared to females. Individual feed requirements are primarily determined by age, body weight, and feeding behaviour so that livestock feel comfortable and can maximise body weight gain. Nielsen and Jong (2016) support it that in order for livestock to feel comfortable and achieve animal welfare, feeding behaviour needs to be considered.

Conclusions and Suggestions

Phenotype profile of body weight at one year of age in male goats from fraternal twins had VP, quartile deviation and mean deviation more varied 51.95%, 120%, 38% compared to female goats.

The research suggests that the feeding of male cattle resulting from fraternal twins should be based on individual feeding requirements, determined by age, body weight, and feeding behaviour so that livestock feel comfortable so that bodyweight gain can be maximized.

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