

The Effects of Non-Genetic Factors on The Birth Weight, Litter Size and Pre-Weaning Survive Ability of Etawah Cross-Breed Goats in The Breeding Village Center in Ampelgading District

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ABSTRACT

A total of 106 late gestation goats (age 4-5 months of pregnancy) records each of Etawah Crosbred goats kept on small farmer over a period of 10 years were assessed to determine the effects of environmental factors on them. Body Condition Score is non-genetic factor and in dairy goats to predicted milk production, fertility, and general health of the animal because BCS is visualisasi from feeding manajement. The objective of this study was to investigated the relationship between Body Condition Score (BCS) of late gestation with litter size and birth weight on etawah crossbred goats. The results showed that the average of litter size and birth weight (kg) were 1.89 ± 0.66 and 3.84 ± 0.73 respectively. The relationship between BCS with litter size were 0.13 (very low) and the relationship between BCS with birth weight were 0.11 (very low). The conclusion of this research is BCS of late gestation had positive correlation on litter size and birth weight, however this was low and birth weight as first indicator of future growth rate.

Keywords: birth weight; litter size; late pregnancy; body condition score (BCS).

INTRODUCTION

Etawah crosbred goats called Peranakan Etawah (PE) in Indonesia is an important component of animal genetic resources and they valued mainly for their milk, meat and fiber, and have

socioeconomic relevance there are socioeconomic, cultural and recreational. PE goats originally descend from crossings between the Kacang (lokal) with Etawah (Jamnapari) goats (imported from India). PE goats have a longer body frame, long hanging ears, a convex face and larger horns.

The potency of production can be expresion in birth weight, weaning weight, growth rate and milk production. Birth weight kids is important to know because it is highly correlated with goat life, growth rate and adult size. Therefore, the recording of birth weight should be done carefully, and it is recommended that weighing the birth weight be done within one hour after birth, this is done with the consideration that in the period of time the goat child has not received kolustrum, birth weight is strongly influenced by the condition of the parent during pregnant old that can be reflected from the value of body condition score (BCS).

Body condition score (BCS) has been shown to be an important practical tool in assessing the body condition of cattle, sheep, and goats because BCS is the best simple indicator of available fat reserves which can be used by the animal in periods of high energy demand, stress, or suboptimal nutrition (Villaquiran et al., 2004). BCS is a better predictor of body fat than live weight. There many report suggesting a correlation of BCS with reproductive performance Yilmaz et al.

(2011). Serin et al. (2010) found in a study BCS rates of Saanen goats in beginning of synchronization have affected on pregnancy rate. BCS has a relationship body weight such as growth, pregnancy, birth process, lactation, all of these periods will affect the weight of goats. Failure to maintain good body condition or rapid BCS changes during early pregnancy indicates a health problem or feed management.

Litter size was defined as the number of kids born per kiddy doe (Haldar et al., 2014). Litter size at birth was affected by parity with the first kidding being the smallest (Song et al., 2001). Odubote (2000) demonstrated that litter size of West African Dwarf significantly affected by parity. Mean litter size at birth was 1.79 ± 0.05 kids. Litter size and birth weight are important because they are highly correlated with the growth rate, adult size and life-span of the kid. Litter size are strongly influenced by the parity and size of the does.

BCS of doe affects the parent's ability to give birth to the litter size. Litter size and birth weight of kid have important economic significance, useful to evaluate the mothering ability of doe. Body condition score of does significantly ($p < 0.001$) influenced both birth weight and litter size, these traits increased significantly with increase in the body score (Zahraddeen et. Al., 2007). Based on Haldar et al. (2014) there was a strong, positive relationship between litter size and various body linear type traits. According Susilorini et al., (2014) BCS have significant association with milk production on PE goats, increased BCS at early lactation was associated with a higher milk production. Birth weight of kidding is regarded as one of the most importance contributing factors for improving growth performance. The

objective of this study to investigated the relationship BCS on late pregnancy on birth weight, litter size and survival rates in goats.

MATERIALS AND METHODS

The study area included in Ampelgading districts, Malang regency and in the villages goats are reared in small farmer of to 10 goats per household. Data collected by purposive sampling, that is sample which used does in late pregnant (4-5 months). Herd details were recorded on an individual data card consisted of number of females, kids and whether buck maintained in the herd, age of the female goats, parity, last date of kidding, previous litter size, current date/month of last breeding etc. BCS were observed on late pregnant of doe, partus, post partus (90 days after kidding), Assessment of BCS using the standards of Villaquiran (2004) by feeling the amount of muscling and fat deposition over and around the vertebrae in the loin of the does. Score were given as follow:

Score 1: Spinous processes are sharp and prominent. Loin eye muscle is shallow with no fat cover.

Score 2: The means sharp and prominent spinous processes. Loin eye muscle has little fat cover but is full.

Score 3: Spinous processes are smooth and rounded and one can feel individual processes only with pressure, Loin eye muscle is full with some fat cover.

Score 4: Spinous processes can be detected only with pressure as a hard line, transverse processes cannot be felt and loin eye muscle is full with a thick fat cover.

Score 5: It is impossible to detect. Spinous processes and the loin eye muscle is very full with a very thick fat cover.

RESULTS AND DISCUSSION

Body Condition Score (BCS).

BCS is an indicator to know the fat reserves used of livestock during stress, energy demand or high staple nutrients and body condition is related or affect the various events of livestock reproduction. The relationship between BCS at calving and BCS loss was used to study the effect of conditioning of cows at calving and the subsequent severity of negative energy balance (EB) Body condition loss, as an indicator of EB, was used to study the impact of negative EB on stress symptoms, by correlating it to yield (Dechow et al., 2001), days to first insemination, services per conception, conception rate, conception rate after first insemination (Gillund et al., 2001) and oocyte development (Snijders et al., 2000). The results of BCS assessment in the study location of 106 goats (gestation age 4-5 months), BCS does on late pregnant, partus, and postpartum (90 days after partus) showed in Table 1.

The importance of observing BCS to determine the condition of the goat in order to obtain goats with top-condition or for repair and maintenance evaluation. Based on the physiological status it can be seen that BCS at the old pregnant goat has a high value, decreased at the time of partus and tended to decrease at post partus (90 days after the partus).

Body condition score of does significantly ($p < 0.001$) influenced both birth weight and litter size. These traits increased significantly with increase in the body score (Zahraddeen, et al., 2007) BCS has a high correlation with milk production and composition, many studies have proven, among others (Zahraddeen et al., 2007; Pambu et al., 2011). In accordance with the opinion of Sahlu and Goetsch (2003), it states that at the beginning of lactation the condition of BCS high and the end of lactation decreased. This is because at the beginning of lactation goats tend to low feed consumption so that goats change body reserves for milk production so BCS goat down, at this condition livestock experience condition of NEB (Negative Energy Balance) that is incoming energy smaller than energy for milk production. According to Ginting (2007), the PE goat must have the ideal BCS at each period, the ideal BCS for the old pregnancy period is 2.0-2.5, BCS at partus is 2.0-2.5 and BCS one month after partus of 3.0-3.5. According to Koyuncu and Altincekic (2013), the ideal BCS expectation on the old pregnant parent reaches BCS 3.5, BCS Partus 2.5, and BCS weaning 2. So BCS 2 to 4 is still said to be ideal on various physiological status of goat PE. In this study BCS of does were ideal condition at late gestation and higher than Ginting (2007) studied.

Table 1. BCS Late Pregnant of Does Depend on Physiologies Status.

BCS	Physiologies Status		
	Late gestation	Partus	Post Partus
This study (n=106 does)	2.99 ± 0.51	2.52 ± 0.53	2.37 ± 0.42
Ginting (2007)	2.0 – 2.5	2.0 – 2.5	3.0 – 3.5
Koyuncu (2013)	3	2.5	2

Birth Weight and Litter Size.

Birth weight has a very important role because it is highly correlated with the rate of growth, adult size, child survival and to achieve good productivity in adulthood. The high variability of birth weight, birth type and pre-weaning survivability presents an opportunity for genetic improvement of these traits in goat. Pre-weaning survivability is the most important trait amendable for genetic improvement as it had the highest coefficient of variation. According to Kostaman and Sutama (2006) birth weight is one of the factors that can be used to predict growth and weight in adulthood, high birth weight of a young goat will grow faster than children who have low birth weight, because goats that have high birth weight has more food reserves, so the opportunity to grow and live is also great. The birth weight of a goat sample study as in Table 2.

Birth weight can used to phenotypic parameter for selection on the goats, because birth weight has role to increasing growth. The result of this experiment indicated that BCS = 3 had a significant effect ($P < 0.05$) on the kg lambs born per ewes. Ewes with BCS = 3 had a

better performance in the percentage of lambs born per ewes at mating, while the lambing rate reduced in ewes with BCS of 3.5 or more. Birth weight of lambs was significantly affected by BCS of their ewes ($P < 0.05$). Davendra (2007) noted that birth weight is regarded one contributory factor for improving growth performance and first indicator of future growth rate. Litter size was defined as the number of kids born per kidding doe. Litter size or prolificacy has a very significant influence on reproduction efficiency. Bearden and Fuguay (2001) also noted that a number of biological factor influences the actual litter size in a flock of goats. Awemu et al. (2002) working in Red Sakoto goats in Nigeria found than litter size at birth (1.8 kids) was significant affected by parity. Birth weight generally declined with increase in litter size Kids born as single were significantly heavier than twins and triplets, The research of Hagan et al., (2014) the average birth weight of twins (1.21 ± 0.01 kg) was higher that of the triplets (1.13 ± 0.02 kg). Jalilian and Moeini (2013) founded that birth weight of lambs was significantly affected by BCS of their ewes ($P < 0.05$).

Tabel 2. Litter Size dan Birth Weight Kids of Crossbred Etawah on BCS of Late Gestation Does.

	BCS of does				
	2(n=10) 9.43%	2.5(n=29) 27.36%	3(n=40) 37.74%	3.5 (n= 22) 20.75%	4(n=5) 4.72%
Litter Size	1.9 ± 0.88	1.7 ± 0.59	1.9 ± 0.64	1.8 ± 0.64	2.4 ± 0.89
Birth weight (kg)	3.49 ± 0.92	3.69 ± 0.79	4.11 ± 0.69	3.77 ± 0.56	3.69 ± 0.19

CONCLUSION

It is concluded that BCS of goat on late pregnant had a significant effect on, birth weight and litter size of kid. And the BCS 3 could optimize profitability of Etawah Crossbred. In whole goat with body condition score (BCS) of 3 had a better performance.

ACKNOWLEDGEMENT

This project was funded by The Ministry of Technology Research and Higher Education Indonesia through project No: 033/SP2H/LT/DRPM/II/2016 on February 17th 2016. We also wish to thank Etawah crossbred (PE) goat farmers in Ampelgading village.

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