

Does Productivity Index of Boerawa Does and Etawa Grade Does Fed by Traditional and Rational Foodstuff

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ABSTRACT

Boerawa goat is crossbreed between Boer buck and Etawa Grade does. This research was conducted to investigate: (a) interaction between goat breed and kind of foodstuff to does productivity index of Boerawa does and Etawa Grade does, (b) the effect of goat breed on does productivity index of Boerawa does and Etawa Grade does, (c) the effect of kind of foodstuff on does productivity index of Boerawa does and Etawa Grade does based on their kid weaning weight. This research was conducted with experimental method using 20 Boerawa does and 20 Etawa grade does having two-three times of kidding period. Ten Boerawa does and 10 Etawa grade does got rational foodstuff (60% forage and 40% concentrate), and 10 Boerawa does and 10 Etawa grade does got traditional foodstuff (100% forage). Factorial (2x2) of completely randomized design with ten replications was used in this study. The result showed that there was no interaction between goat breed and kind of foodstuff to does productivity index of Boerawa does and Etawa Grade does. The result indicated also that does productivity index (40,900 kg) of Boerawa does higher ($P<0,01$) than does productivity index (30,996 kg) of Etawa Grade does. The result indicated also that does productivity index (41,298 kg) of goat got rational foodstuff higher ($P<0,01$) than does productivity index (30,598 kg) of goat got traditional foodstuff. It could be concluded that Boerawa does were more productive than Etawa Grade does.

Key word: weaning weight, Boerawa does and Etawa Grade does, does productivity index

INTRODUCTION

Genetic improvement is an integral part of many goat development programmes in the tropics, where breeding policies mostly aim to upgrade local goats by crossbreeding with, either temperate or tropical exotic breeds. The Boer goat is a famous meat goat breed in the world. It is well-known for fast growth, high reproductive, strong adaptability, and excellent meat-purpose body conformation. Since 2001, the Lampung Provincial Government has introduced some Boer goats from Australia. The Goats were reared to be collected their semen. The semen then be processed to be frozen semen that will be inseminated to local goat of farmers in some villages, one of them was Campang Village, Gisting District, Tanggamus Regency, Lampung. In the village, the farmers had united in some groups.

Crossbreed between Boer buck and Etawa grade does was namely Boerawa goat. Based on our observation, Boerawa crossbreed has meat type characteristic. Population of Boerawa goat increased significantly in Lampung, although the

farmers fed the goats with conventional ration i.e. forage without concentrate ration. The farmers like very much to the performance of Boerawa goat. Boerawa goat grew faster than Etawa grade goat. Service per conception of both goat were not different significantly, it was about two. The first kidding of Both Boerawa and Etawa grade goat were single type, but for the following kidding it would be twin or triplet. Besides that, there is not unpleasant odor of Boerawa goat body like in Kacang or Etawa grade goat, thus farmers like Boerawa goat very much.

Population of Boerawa goat increased significantly in Lampung, although the farmers fed the goats with conventional ration i.e. forage without concentrate ration. Nevertheless, until now there is no information on evaluation of this crossbreed. Crossbreed evaluation on its productivity is very important to decide the development of the crossbreed (Basuki *et al.*, 1998). Crossbreed productivity can be evaluated by computing the value of does productivity index (DPI). This value describes kid body weight production produced by a doe or group of

does per year by calculating kidding interval, litter size, and kid body weight at certain age.

Development of both Boerawa and Etawa grade does was good enough although they got the same treatment by the farmers. Actually based on their original Boer and Etawa goat have some differences. Boer goat that is from South Africa and developed in Australia has mating season, but Etawa goat that is from India does not has mating season. Besides that, Boer goat is meat type, while Etawa goat is dual-purpose. Boerawa and Etawa grade does were applied by feeding the same treatment i.e forage only. It is estimated that their productivity are not optimal. It is important to optimize by adding rational foodstuff i.e forage and concentrate.

This research was conducted to evaluate productivity of Boerawa and Etawa grade does fed by traditional (forage only) and rational foodstuff (forage and concentrate) in order to know whether both goat give the same or different respon to different foodstuff quality. In detail the objective of this research were to investigate: (a) interaction between goat breed and kind of foodstuff to does productivity index of Boerawa does and Etawa Grade does, (b) the effect of goat breed on does productivity index of Boerawa does and Etawa Grade does, (c) the effect of kind of foodstuff on does productivity index of Boerawa does and Etawa Grade does based on their kid weaning weight.

MATERIALS AND METHODS

This research was done in February-September 2007, in Campang Village, Gisting District, Tanggamus Regency. This research was conducted with experimental method using 20 Boerawa does and 20 Etawa grade does having two-three times of kidding period. Ten Boerawa does and 10 Etawa grade does got rational foodstuff (60% forage and 40% concentrate), and 10 Boerawa does and 10 Etawa grade does got traditional foodstuff (100% forage). Factorial (2x2) of completely randomized design with ten replications was used in this study. The first factor (A) was breed of goat, i.e: Boerawa and Etawa grade does. The second factor (B) was kind of foodstuff, i.e: rational and traditional foodstuff. Parameters investigated in this study were weaning weight, kidding interval, birth type, does age, and mating recording.

These parameters were used to compute does productivity index of Boerawa does and Etawa Grade does based on their kid weaning

weight. Data were analyzed statistically using ANOVA and continued with Duncan's Multiple Range Test (Steel and Torrie, 1991).

RESULTS AND DISCUSSION

Weaning Weight

Weaning weight is body weight at the time of weaning in 4 months of age. Weaning weight is one of criterion considered in goat selection because weaning weight reflected a does in producing milk and growing its kids. The average of weaning weight of Boerawa and Etawa grade goat fed by traditional and rational ration are presented in Table 1.

Table 1. Weaning weight (kg) of Boerawa and Etawa grade goat fed by traditional and rational foodstuff

Goat breed	Foodstuff		Average
	Traditional	Rational	
Boerawa	18.402 ^b	22.949 ^c	20.675
Etawa grade	16.813 ^a	18.063 ^b	17.438
Average	17.608	20.506	19.057

Note: The different superscript indicated significant effect ($P < 0.05$).

Table 1 showed that weaning weight average of Boerawa goat fed by traditional and rational foodstuff were 18.402 ± 0.535 kg and 22.949 ± 4.722 kg respectively, while in Etawa grade goat were 16.813 ± 0.885 kg and 18.063 ± 1.475 kg respectively. The result indicated that there was interaction between goat breed and kind of foodstuff to weaning weight average. The result indicated also that weaning weight of Boerawa goat was higher ($P < 0.01$) than that of Etawa grade goat whether fed by traditional or rational foodstuff. The high weaning weight of Boerawa goat was caused by its genetic. Boerawa goat grew faster than Etawa grade goat at the same age. This genetic of growing faster is inherited by Boer goat. Hass (1978) reported that average daily gain before and after weaning of boer crossbreed were 114.0 g and 65.0 g respectively, while in Etawa grade were 103.90 ± 4.0 g and 65.60 ± 2.0 g respectively (Sulastri, 2001).

Inheritance potential of Boer goat to its progeny was proved if Boer goat crossed by other breed goat. Das *et al.* (2005) reported that body weight of Blended goat (Kamorai 55%, Boer 30%, and local goat 15%) could achieve 11.14 ± 0.15 kg at 16 weeks of age with ADG

before weaning 80.0 ± 1.0 g. Body weight of Blended goat at 150 days was 19.7 kg that was higher than Little East Africa (LEA) goat (14.9 kg) with ADG preweaning of Blended and LEA were 84.0 g and 11.0 g respectively. Thus, Boer goat has good combining ability if it is crossed by other breed included with Etawa grade goat indicated by high potential growing of crossbreed.

The result showed that weaning weight of Boerawa goat was higher than that of Etawa grade goat. This was caused by the higher milk production of Boerawa does than of Etawa grade does. Barry and Godke (2005) reported that milk production of Boerawa does were 2.5 liter/head/day, while Etawa grade does produce 1.5 liter/head/day milk (Yusnandar, 2004).

The high weaning weight of Boerawa goat was caused by the high birth weight (2.875 ± 0.155 kg), while birth weight of Etawa grade goat was 2.201 ± 0.453 kg. Birth weight positively correlated to weaning weight. Sulastri (2001) reported that genetic correlation between birth weight and weaning weight estimated by parent-offspring correlation and by halfsib correlation were 0.54 ± 0.29 and 0.29 ± 0.9 respectively.

The result indicated that weaning weight of goat fed by rational foodstuff was higher ($P < 0.05$) than that of goat fed by traditional foodstuff whether in Boerawa or Etawa grade goat. This indicated that improving foodstuff quality could increase milk production of does and finally could increase kid weaning weight.

Litter Size

The results on litter size are presented in Table 2. Table 2 showed that litter size of Boerawa does fed by traditional dan rational foodstuff were 1.767 ± 0.37 and 1.833 ± 0.408 respectively, while in Etawa grade does were 1.600 ± 0.225 and 1.667 ± 0.283 respectively. The result indicated that there was no interaction between goat breed and kind of foodstuff to litter size. Litter size between Boerawa and Etawa grade does did not differ significantly ($P > 0.05$). Litter size of goat fed by traditional and rational foodstuff did not differ ($P > 0.05$) either. This result was relatively the same as the result reported by Pamungkas *et al.* (2005) in crossbreed Boer x Kacang goat (1.6). The result of present study was within the range of the result reported by Barry and Godke (2005) in Boer goat (1.6-2.1), but relatively higher than the result

reported by Subandriyo *et al.* (1995) in Etawa grade does (1.3-1.6).

Table 2. Litter size of Boerawa and Etawa grade does fed by traditional and rational foodstuff

Goat breed	Foodstuff		Average
	Traditional	Rational	
Boerawa	1.767	1.833	1.800
PE	1.600	1.667	1.633
Average	1.683	1.750	1.717

Table 3. Kidding interval of Boerawa and Etawa grade does fed by traditional and rational foodstuff (month)

Goat breed	Foodstuff		Average
	Traditional	Rational	
Boerawa	11.750	10.450	11.100
PE	11.550	10.650	11.100
Average	11.650	10.550	11.100

Kidding Interval

Kidding interval is period between two sequence kidding that consist of mating period (from kidding to conception period) and pregnant period (Devendra and Burns, 1994). Kidding interval is very important factor that decide high and low production of kid resulted by doe per year (Abdulgani, 1981). Kidding interval of Boerawa and Etawa grade does fed by traditional and rational foodstuff are presented in Table 3.

Table 3 showed that kidding interval of Boerawa does fed by traditional and rational foodstuff were 11.75 ± 0.486 and 10.450 ± 1.442 month respectively, while in Etawa grade does were 11.55 ± 0.497 and 10.650 ± 1.055 month respectively. The result indicated that there was no interaction ($P > 0.05$) between goat breed and kind of foodstuff to kidding interval. Kidding interval of Boerawa and Etawa grade does did not differ significantly ($P > 0.05$). This result was longer than the result reported by Devendra and Burns (1997) i.e 327 days (10,9 month) and that was reported by Setiadi *et al.* (1995) i.e 10 month.

Does Productivity Indeks (DPI)

Does Productivity Indeks (DPI) is does ability description in taking care of their kids up to weaning age and growing up their kids to achieve certain weight in certain age in one year

(Sumadi, 1993). Does productivity index of Boerawa and Etawa grade does based on weaning weight are presented in Table 4.

Table 4. Does productivity index of Boerawa and Etawa grade does fed by traditional and rational foodstuff

Goat breed	Foodstuff		Average
	Traditional	Rational	
Boerawa	33.221	48.579	40.900b
PE	27.974	34.018	30.996a
Average	30.598a	41.298b	35.498

Note: The different superscript in the same row or column indicated significant effect ($P < 0.05$).

Table 4 showed that DPI of Boerawa does fed by traditional and rational foodstuff were 33.22 ± 7.068 kg and 48.579 ± 12.969 kg respectively, while in Etawa grade does were 27.974 ± 4.192 kg and 34.018 ± 5.907 kg respectively. The result indicated that there was not interaction ($P > 0.05$) between goat breed and kind of foodstuff to DPI. The result indicated also that DPI of Boerawa does was higher ($P < 0.01$) than that of Etawa grade does. Goats fed by rational foodstuff were higher ($P < 0.01$) than those fed by traditional foodstuff. The higher DPI of Boerawa does was caused by the higher weaning weight of their kids (18.402 ± 0.535 kg) compared with weaning weight of Etawa grade kid (16.813 ± 0.885 kg), although kidding interval and litter size of both breed were not difference significantly.

The higher weaning weight of Boerawa kids was caused by the higher preweaning ADG of Boerawa kids (0.099 ± 0.007 g) compared with preweaning ADG of Etawa grade kid (0.085 ± 0.005 g). This higher preweaning ADG of Boerawa kid was caused by genetic potential inherited by Boer buck as meat type, while the lower preweaning ADG was caused by genetic potential inherited by Etawa goat as dual purpose type.

CONCLUSIONS

Boerawa does were more productive than Etawa Grade does that it was proved by the higher weaning weight of their kids compared with those of Etawa grade kid, although litter size and kidding interval of both breed were relatively the same.

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