

The Effect of Starting Time of Hand Milking on Lactation Period and Milk Production of Etawah Crossedbred Goat in Smallholder

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ABSTRACT

The study was done in a group of farmers in Sleman Yogyakarta. The aims of study was to investigate the effect of starting time of hand milking on goat on their lactation period and milk production. Data were collected by interviewed farmers and observation in the farm. Number of total sample were 38 respondents. Samples were divided into group A and B. Group A consisted of farmers who began conducting hand milking in the first or second month of lactation, by separating the kids at night. Group B were farmers who began milking the doe by hand at 2 to 3 months of lactation, after the kids were completely weaned. The does in both groups were milked once every morning. Data pertaining reproductive traits data was obtained by interviews with farmers, based on the data of goats that were milked at the time of the study. The data consists of number of lactation (parity), litter size, the doe (whether it is pregnant during the lactation period), post-partum mating. The starting time of hand milking on goat has no effect on lactation period but significantly affected post-partum matting the duration of milking a goat by hand and milk production for consumption. The value in group A and B were respectively 3.15 Vs 5.18 months, 4.46 and 2.20 months, 18.31 and 10.35 Liter. milking that was started at the 1st to 2nd months of lactation caused shorter PPM, longer milking time for commercial milk and more collected milk production, so that more efficient to produce kids and milk for commercial purposes.

Keywords: Weaning methods, Lactation period, Milk production goat

INTRODUCTION

Majority of small scale dairy goat farmers in Indonesia produce milk used dual purpose goat which is known as Etawah Crossedbred goat. Milk production and lactation period of goats are influenced by various factors, such as breed, feed, litter size, maintenance and milking intervals (Hogberg, 2011). The lactation curve is a graph between milk production and the period of time that begins at the time of parturition. Lactation curve useful to predict milk production on a daily basis during the lactation period and showed a guideline to determine the decision in maintenance, for example for culling, feeding, and breeding. Knowledge of the lactation curve and its influencing factors can be used as information to evaluate biological efficiency of goats (Grossman dan Koops, 1988 disitasi Takma *et al.*, 2009).

The current smallholder situation, conducting milking to produce commercial goat milk was started at different times during the lactation period of a goat. The initial time of hand milking was adjusted to the demand of goat milk for consumption and the purposes raising kids. Some Farmers start milking at the first or second month of lactation while others preferred to start after the kids were completely weaned at 3 months after kidding. Therefore, milk production and lactation curves varied. The effect also appeared in the reproductive

performance of doe. This study aims to evaluate the differences of time to start milking by hand on during the period of lactation on lactation period, milk production and some reproductive trait of Etawah Crossed bred goat under small holder management. The result was expected to find management guideline of dual purpose goat to achieve milk and goat production efficiency.

MATERIALS AND METHODS

Materials

The study was conducted in 2 groups of farmers, located in the villages of Kaliurang and Sukorejo, Sleman, Yogyakarta. Data were collected by interview, observation and collecting data from recording. Material of study consisted of 38 respondents. The respondents were small farmers who raised Etawah Crossed bred goat to produce milk and organized in the group. Materials of study consisted of questioner, recording, equipment to measure and collected milk.

Methods

Respondents in this were members of Sukorejo and Kaliurang Timur farmer groups. The number of respondents totally were 62 farmers. In this study respondents were selected only 38 farmers based on their practical milking. The selected respondents were divided into 2 groups. Group A consisted of farmers who began conducting hand milking in the first or second month of lactation, by separating the kids at night. Group B were farmers who began milking the doe by hand at 2 to 3 months of lactation, after the kids were completely weaned. The does in both groups were milked once every morning. Goats in this study are kept in the pen, feed consisted of Kaliandra forage, grass and leaves was given by cut and carry. Wheat pollard was added as feed supplement for lactating does.

Data pertaining reproductive traits data was obtained by interviews with farmers, based on the data of goats that were milked at the time of the study. The data consists of number of lactation (parity), litter size, the doe (whether it is pregnant during the lactation period or no), post-partum mating. Milk production data were taken from recording, consisting of milk production, the time during lactation when milking by hand was started and finished. The duration of lactation was calculated from kidding time until the end of milk production (when the volume of milk yield was less than 50 mL/day). The period of hand milking was calculated from the time when hand milking started until the end of milk production. The data obtained were statistically analyzed by T-test.

RESULTS AND DISCUSSION

Effect of starting time of hand milking during lactation on reproductive performance

The results on farmers interview showed that the goats in this study have already passed 1 to 4 times lactation. The average parity of goat in groups A and B were not significantly different, on average were 1.46 and 2.6 times, respectively (Table 1). The litter size of goat in group A on average was 1.46 (single birth to triplet) and in group B of 1.85 kids/doe (single birth to twin 4). There was an effect of the initial time of milking goat on post-partum mating (PPM) of goat, showed by shorter PPM of goats in group A compared to that in group B ($P < 0.05$). The value of PPM was averaging 3.15 and 5.40 months, respectively for group A and B (Table 1).

Table 1. Parity, litter size and post-partum mating of goats

| | A | B |
|--|---------------------------|---------------------------|
| Parity (times of lactation) | 1.46 ± 0.66 ^{ns} | 2.60 ± 2.04 ^{ns} |
| Litter size (kid/doe/kidding) | 1.46 ± 0.66 ^{ns} | 1.85 ± 0.87 ^{ns} |
| Post partum mating (months) 12/15 dan 13/18 | 3.15 ± 1.25 ^a | 5.18 ± 1.37 ^b |
| Number of goats already pregnant during lactation period (percentages of total number) | 80 | 72 |

^{a,b}mean value in the same row with different superscript showed significant (P<0.05)

Effect of starting time of hand milking on lactation period and milk production

The lactation period of goat in group A did not differ significantly with that in group B. The value were 4.46 and 4.60 months, respectively. The different time in started milking goats by hand caused a significant difference (P<0.05) in the duration of goat producing milked for commercial purpose. The capability of a goat to continue lactation were 4.46 and 2.20 months respectively for those in group A and B (Table 2). Group A showed the longer-term milking period because hand milking had been started since the goats were still nursing their kids, while in the group B the hand milking started after the doe had completely weaned the kids.

The interview data showed that 80% of does in group A have already during lactation, while in group B that was 72%. The lactation period and PPM (Table 1) indicated that the conceived of goats of 1.43 months while lactation continued in group A, because PPM was shorter than lactation period. In group B, the goats did not conceive when lactation dried off, the difference was 0.58 months. Milk that was obtained from hand milking in group A was higher (P <0.05) than that group B of 18.31 and 10.35 Liter, respectively. Goats in group B the collected milk only came from milk that was not consumed by kids.

Table 2. Lactation period, duration of hand milking, milk production of goats

| | A | B |
|---|----------------------------|----------------------------|
| Lactation period (month) | 4.47 ± 0.42 ^{ns} | 4.60 ± 0.22 ^{ns} |
| Duration of hand milking period (month) | 4.46 ± 0.42 ^a | 2.20 ± 0.44 ^b |
| Milk production by hand milking (Liter) | 18.31 ± 11.21 ^a | 10.35 ± 10.33 ^b |

^{a,b}mean value in the same row with different superscript showed significant (P<0.05)

DISCUSSION

Goat milk in this study was produced during the period of 1st to 3rd parity, that include in productive time production. Other results of study indicated that lifetime production of Etawah Crossed bred doe was 7.23 years (Aprillinda et al., 2016). The first mating was at the age of 12 months and the interval of kidding was 9 months (Malik, 2016). In general, tropical female goats, often first mating by 13 to 14 months (Taye et al., 2013). The study showed that farmers in the group made use of goat to produce milk during the beginning of productive time. The average litter size of goat were 1.46 to 1.85 kid/doe and PPM occurred 3 to 5 months. The goats in group A showed shorter PPM, averaging 3.15 months, so the kidding interval could be estimated to be 8.15 months. Therefore, the goats in group A could be kidding 3 times in about 2 years. The results indicated that Etawah Crossedbred goat's high reproductive trait (short kidding interval and high litter size) was in accordance with the characteristic of dual purpose goat. The average of litter size of this study was like that of West African Dwarf, the most prolific goat (Chickwuka et al., 2010; Mellado et al., 1991). Kidding intervals of goat in

this study was like tropical goats, at around 250 to 307 days (Chuckwuka et al., 2010, Attfield, 1990; Taye et al., 2013). In terms of reproductive aspects, the goat in group A, had more advantageous indicated by short kidding intervals and tendency to produce multiple births. Therefore, could be expected to produce more kids.

The milk-ability Etawah Crossedbred goats in this study was evaluated by measuring milk yield and lactation period. The goat in both of groups A and B showed no difference in lactation period. The length of period as 4.47 and 4.60 months was like other study results in Baturraden, indicating lactation duration of 5 to 7 months (Adiarto et al., 2015). In addition, the length of lactation period was longer than that of several tropical goats as 108 ± 13 days (Gaytán et al., 2016) and 143 to 172 (El Hag et al., 2000). Goat in group A had longer period to produce commercial milk longer than those in group B as 4.46 Vs. 2.20 months, as well as milk obtained from hand-milking (18.31 Vs. 10.35 Liters). The reason was group A started collected milk by hand milking in early lactation, thus obtained milk from peak to dried off production, whereas in group B milk is derived only from the late lactation. According to Souza et al., (2014). The first phase of the lactation period is called peak phase, this period is achieved at a short time. The second phase of the lactation period illustrates persistence. This phase is mainly influenced by parity. Milk production affects second phase characteristics compared to the first phase. According to Marete et al., (2014) the peak of lactation reached at week 4. Alpine Crossed goats in small holder of Kenyan, produced average milk production of 0.75 kg/day during peak production and 90 kg of the first 3 months. Similarly, Waheed and Khan (2013) showed peak milk production at around 4 to 8 weeks after birth. The results of Adiarto et al (2015) milk production of Etawah Crossed bred goats in Baturraden during the last 2 months of lactation period, equal to 14% of total lactation milk. According to the above result, goat in group B in this study can be estimated to produce 73.78 Liters/lactation. Other study reported lactation yield and length of several goat breed were found to be 83 to 163kg/143 to 172 days (El Hag et al., 2000). Milk production that was collected during the late lactation of goat in this study was considered low, however milk yield reflected the component product of dual purpose goat, in addition to kids.

Goat production efficiency is to dependent on reproductive performance. Etawah Crossed bred goats counted as prolific goat, possessing high frequency of kidding, despite their poor milk production. By started milking the goat in early lactation, the goat reached short PPM, capable to continue lactation and undergo pregnancy prior to dry. This condition could shortened interval of kidding, making goat more milk harvested for consumption. Those was the advantage of the method of early stated hand milking goat. However, the second method (started hand milking at late lactation period) also gave positive result. By this method the goat had short time after weaned the kids to improve the condition of the body before undergo pregnant. It can be expected the kids would be healthy although the goat had longer kidding interval. Certain group of farmers with main purpose to produce kids, reproductive performance is more important than milk, so the method B was more appropriate.

CONCLUSIONS

The starting time of hand milking on goat PE has no effect on lactation period but significantly affected post-partum matting, the duration of milking goat by hand and milk production for consumption. Hand milking that was started at the 1st to 2nd months of lactation caused shorter PPM, longer milking time for commercial milk and more collected milk production, so that more efficient to produce kids and milk for commercial purposes.

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