

Performance of Jamunapari goat (doe) under semi-intensive farming in Pabna district of Bangladesh

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ABSTRACT

The study was carried out to know the productive and reproductive performance of Jamunapari does under semi-intensive condition in Pabna district. For this study data on productive and reproductive traits were collected from 45 goats in which 40 were does and 5 were bucks. Animals were allowed to graze for 6-7 hours and concentrate (17% CP, 11 MJ/kg DM) at 400g/head/day was offered twice daily. The study revealed that the highest milk yield was found in second month and lowest in the fifth month after kidding and there were no significant differences between single or twin type births. Lactation length was 135.4 ± 14.9 and 141.8 ± 12.4 days for does suckling one and two kids, respectively. Milk intake to growth ratio was 15.5 ± 1 and 12.5 ± 1.15 for the litter size of one and two, respectively. Highest milk fat, lactose and SNF% were in the later stage of lactation ($P < 0.01$), where as protein and minerals were similar throughout the lactation. The average age at first estrus, age at first pregnancy and age at first kidding were 352.8 ± 16.4 , 388.4 ± 29.6 and 547.6 ± 62.3 days, respectively. Required services per pregnancy were 1.2 ± 0.7 and the gestation length was 151.8 ± 15.6 days. The overall litter size was 1.5 ± 0.6 and onset of post-partum estrus was 53.8 ± 17.3 days. The findings of this study indicated that performances of Jamunapari goat under semi-intensive condition were good and rearing of this breed would be the future solution of poverty in study area as well as Bangladesh.

Key words: Jamunapari, doe, production, reproduction, Pabna

INTRODUCTION

In Bangladesh goat constitute an important livestock resource. Archaeological proof indicates that the goat was one of the first animals to be domesticated by human beings around 10,000 years ago at the dawn of the Neolithic period in the Fertile Crescent^[13,14]. As like as other domestic goat breeds in South Asia, Bengal goat believed to be derived from wild bezoar of Pasang (*Capra aegagrus*) with infiltrated blood from markhor (*Capra falconeri*)^[16]. There are about 300 goat breeds and varieties domesticated in this subcontinent. In Bangladesh, it makes up about 7% of the total Asiatic goat population which accounted for 20.75 millions heads^[4]. The goat secure second position in aspect of meat and skin production, representing about 38 and 28 percent, respectively, of the total livestock in Bangladesh^[5]. The Jamunapari goat is one of the best dairy goats in India^[18]. The number of Jamunapari in Bangladesh is not clearly identified, but most are found in Chuadanga, Meherpur, Kushtia, Jhenidah, Pabna, and Jessore districts^[6]. It is very renowned dual purpose breeds for its milk and meat production. It is also prolific, twin and triplet births giving breed^[10]. The Jamunapari is well adapted to the unique ravines of this area with its dense bush. Goat's milk is highly nutritious. Goats that produced twins yielded more

milk and had longer lactation^[2]. Weight of dam strongly affects the weight gain of the kids^[17]. Bucks of exotic breeds are being imported by the private sector from India and used for cross-breeding, especially in western Bangladesh. Considering the above facts this study was carried out to investigate the productive and reproductive performances of jamunapari goat in Pabna, Bangladesh.

MATERIALS AND METHODS

The study was conducted at the selected area of Pabna district of Bangladesh from July 2014 to April 2015. A total of 45 does and 05 bucks were randomly selected for this study. The selected goats were ear-tagged and maintained under semi-intensive conditions and housed in slatted floor permanent house raised above the ground. Bucks were kept separate from does to avoid unplanned mating. Animals were allowed to graze for 6-7 hours and concentrate (17% CP, 11 MJ/kg DM) was offered each morning and evening at 400g/goat/day (20 kg concentrate mixture contained 6 kg crushed maize, 10 kg wheat bran, 3 kg mustard oil cake, 0.01 kg vitamin mineral premix, 0.1 kg salt). Water was provided ad libitum. Milk yield was recorded in a register and composition was analyzed fortnightly by

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milk analyzer (Lactostar; Funke GerberLabortechnik GmbH, Ringstrabe 42, 12105 Berlin, Germany) throughout the lactation length. Reproductive traits which include age at first estrus, first pregnancy and first kidding, number of services per pregnancy, gestation length, litter size, post-kidding weight of dam, placental weight, onset of post-partum estrus, kidding interval and interval from parturition to conception were collected from the animal register. Data were analyzed using Statistical Package for Social Science^[21] (SPSS 11.5). For mean comparison, least significant difference (LSD) test was done.

RESULTS AND DISCUSSION

Productive performances

Milk yield

Milk yield is one of the most important productive parameter to evaluate the dairy type breed. In Jamunapari does milk yield at the first to fifth months are shown in Table 1, where the highest milk yield was found in the second month and lowest in fifth month of lactation. Does with twins produced more milk than those with a single kid. Kala and Prakash^[9] also found peak yield in the third two-week period in Jamunapari goats. This breed can produce 4.9 liters of milk daily with average lactation yields 1.5 liters/day^[18]. He also reported that milk yields increased up to the end of two months and then started to decline with an average lactation length of 150 days. Milk yield positively correlated with nutrition, age, genetics and season^[3]. Does with multiple kids produced more milk (520.5 ml/day) than those with single kids (513.6 ml/day). On the other hand, milk intake to growth ratio was 15.6 ± 0.2 and 12.5 ± 0.3 for single and twins, respectively. Peeters [12] found that milk intake to growth ratio was 5.4 ± 0.2 and 4.9 ± 0.3 for single and twins, respectively, which was significantly better than the present findings.

lactation (Table 2). In this study protein%, lactose% and SNF% was highest in 5th month of lactation and lowest in 1st month. Qureshi^[15] found that the protein, lactose and SNF of Jamunapari goat was 3.8, 3.9 and 8.6%, respectively, which was lower than the present findings. Singh and Singh^[20] determined average protein was 2.9% in early lactation, 3.2% in mid lactation and 3.8% in late lactation, which is also lower than that of the present results. Kala and Prakash^[9] reported that fat and protein increased and lactose and average daily milk yield decreased with advancing lactation.

Highest fat, lactose, protein and SNF were in the later stage of lactation where minerals had similar trend throughout the lactation (Table 2). These variations were found due to milk yield, nutrition and season.

Reproduction characters

Age at puberty

The age at first heat or puberty was 352.8 ± 16.4 days, where Miah^[11] found 328.44 ± 10.89 that is slightly lower than this study. Present findings closely agree with the findings of Hasan^[8], he reported the Jamunapari attained puberty at 354.7 ± 17.1 days of age. The variation of findings which occur may be due to genetic cause, feeding and management.

Age at first pregnancy

The mean age at first pregnancy was 388.4 ± 29.6 days (Table 3). Hasan^[8] found the age at first pregnancy of Jamunapari goat was 395.4 ± 29.6 days, which slightly longer than present study. The findings of this study are almost similar with the result of Bhowmik^[11].

Kidding interval

The average kidding interval was 211.5 ± 28.4 days (Table 3). This finding almost similar to the results of Hasan^[7]. Rout^[18] reported kidding interval was 229.3 ± 26.7 days, which is higher than the present

Table 1. Production performances of Jamunapari doe (Mean \pm SD)

Parameters	Litter size		Level of Significance
	1	2	
Milk yield (ml/day)			
1 st month	570.6 \pm 271.6	642.5 \pm 168.6	NS
2 nd month	612.6 \pm 219.1	674.6 \pm 249.7	NS
3 rd month	579.3 \pm 214.3	593.0 \pm 181.1	NS
4 th month	495.3 \pm 117.6	472.1 \pm 136.0	NS
5 th month	310.4 \pm 193.2	221.4 \pm 79.0	NS
Average	513.6 \pm 138.3	520.5 \pm 146.3	NS
Lactation yield (liters)	68.8 \pm 35.9	71.8 \pm 25.5	NS
Lactation length (days)	135.4 \pm 16.5	141.8 \pm 12.4	NS
Milk intake to growth ratio	15.5 \pm 1.5	12.5 \pm 1.15	NS

Milk composition

The highest fat% (6.8 ± 2.1) was obtained at 5th month of lactation and lowest (3.7 ± 0.5) at 1st month of lactation and it was happened because of, milk production was higher at 1st month than 5th month of

findings. Kidding interval of Jamunapari doe was 199.22 ± 2.4 days^[11]. The variations in results which are occurred may be due to the environment and nutrition.

Table 2. Milk composition of Jamunapari doe throughout lactation

Parameter (%)	Month of lactation					Overall
	1	2	3	4	5	
Fat	3.7 ± 0.5 ^a	5.1 ± 0.8 ^a	5.3 ± 0.9 ^a	6.2 ± 0.6 ^{ab}	6.8 ± 2.1 ^{ab}	5.5 ± 1.3
Protein	3.6 ± 0.3 ^a	4.0 ± 0.1 ^a	3.8 ± 0.1 ^a	4.0 ± 0.2 ^a	4.3 ± 0.6 ^b	4.0 ± 0.3
Lactose	5.3 ± 0.4 ^a	5.5 ± 0.3 ^a	5.5 ± 0.3 ^a	6.0 ± 0.1 ^a	6.3 ± 0.8 ^b	5.5 ± 0.5
SNF	10.0 ± 0.8 ^a	10.2 ± 0.2 ^a	10.5 ± 0.6 ^{ac}	11.0 ± 0.4 ^{bc}	11.7 ± 1.5 ^{bc}	10.6 ± 0.8
Minerals	0.7 ± 0.1 ^a	0.7 ± 0.1 ^a	0.7 ± 0.3 ^a	0.7 ± 0.3 ^a	0.7 ± 0.5 ^a	0.7 ± 0.1

abc, values with different superscripts in a row differ significantly (P<0.01); SNF = solids not fat

Table 3. Reproductive characteristics of Jamunapari doe

Parameter	Mean±SD	No of observation
Age at first heat (days)	352.8± 16.4	39
Age at first pregnancy (days)	388.4 ± 29.6	30
Age at first kidding (days)	547.6 ± 62.3	13
Service per conception	1.2± 0.7	39
Gestation length (days)	151.8 ± 15.6	13
Kidding interval (days)	211.5 ± 28.4	10
Litter size	1.5 ± 0.6	13
Single (%)	30.9	15
Twin (%)	58.1	12
Triplet (%)	8.5	10
Post partum estrus (days)	53.8± 17.3	14

SD- standard deviation.

Age at first kidding

The average age at first kidding was 547.6 ± 62.3 days (Table 3). Under farming conditions in India, Rout^[19] reported that the age at first kidding was 737.0 ± 21.3 days. Bhowmik [1] found the mean age at first kidding was 534.00±24.58 days that are almost similar to the present study. This result also support the findings of Hasan^[8], he found age at first kidding was 548.6±68.1 days.

Service per conception

In this study table 3 showed that the service per conception was 1.2 ± 0.7 and it is closely relates with the findings of Miah^[11] and Hasan^[7]. They found the service per conception were 1.34 ± 0.085 and 1.3 ± 0.6, respectively.

Gestation length

The average gestation length for jamunapari goat was 151.8 ± 15.6 (Table 3). This findings closely agree with the results of Bhowmik^[1], they reported that the gestation period of Jamunapari was 151.71 ± 8.19. Hasan^[8] also found the similar results. Other hand Miah^[11] observed that the gestation length was 146.24 days in Jamunapari.

Litter size

Table 3 showed the average litter size of Jamunapari doe was 1.5 ± 0.6 with kidding produced single, twin and triplets in 30.9, 58.1 and 8.5% of cases, respectively. This results are closely relates with the findings of Miah^[11]; he described the average litter size was 1.59 ± 0.109. Rout^[18] mentioned that 56.2,

43.1 and 0.7% of litters were single, twin and triplets in Jamunapari, respectively.

Post partum estrus

The mean post partum estrus period of Jamunapari doe was 53.8 ± 17.3 days in this study where Hasan^[8] observed 50.9 ± 18.3 days which is somewhat 3 days lower than the present study. Miah^[11] reported that the average post partum heat period for jamunapari was 63.25 ± 4.3 days that is about 10 days higher than present findings

CONCLUSIONS

From the present study it was found that most of the productive and reproductive performances of Jamunapari doe were good in semi intensive condition. So it can be concluded that rearing of Jamunapari goat would take part to minimize the poverty in Bangladesh

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