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A study on reproductive parameters of goats in Mirzapur district Uttar Pradesh

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Abstract
The present study was aimed to investigate the Reproductive Parameters of Goats in Mirzapur District Uttar Pradesh. The data were collected on reproductive performance different extensive, semi-intensive and intensive system for goat rearing this study. Under extensive system, the reproductive performance namely Age of first service, first kidding, Number of kidding, kidding interval, Number of kids, Gestation Length, Mortality rate and Sex ratio were 533±11.08 day, 685±15.64 days, 10.04±0.79, 334±14.24 days, 1.46±0.57 days, 152±1.84 days, 16.06±1.44 per cent, male kid was 52.72±2.65 and female kid was 47.28±3.46 per cent, respectively. The same values for semi-intensive system were 496±3.99 days, 644±22.85 days, 11.47±0.88, 285±13.48 days, 1.85±0.73, 148±1.32 days, 11.97±1.47 per cent, male kid was 58.14±1.49 and female kid was 41.86±2.89 per cent, respectively. The same values for intensive system were 520±8.23 days, 666±15.4 days, 11.03±0.87, 304±11.45 days, 1.80±0.79, 149±1.73 days, 12.46±1.38 per cent, male kid was 56.17±1.81and female kid was 43.83±1.95.

Keywords: Age of first service, first kidding, number of kidding, kidding interval, number of kids, gestation length, mortality rate and sex ratio

1. Introduction
Goats play an important role in the rural economy at national level. More than 70 percent of the landless agricultural labourers and marginal and small farmers of the rural India rear them. The socio-economic value of goat rearing as compared to other livestock species has been immense, for the poor farmers. The low input, high fecundity, easy marketing and unprejudiced social acceptance of their products are few of many advantages of this enterprise that provides assured higher income. Goats are also among the main meat-producing animals in India, whose meat (chevon) is readily preferred irrespective of caste, creed and religion. They produce a variety of products, mainly meat, milk, skin, fiber and manure. The goats are particularly useful in the semiarid, arid and mountainous regions, where they can sustain on sparse vegetation and extreme climatic conditions. Further, wherever irrigation facilities are poor, one can generally find large areas of waste and other common property land; on which the small ruminants of rural resource-poor households can survive.
Mirzapur is one of the seven most drought prone and among the 17 back ward districts of U.P. Out of the total area of 1312 thousand hectares, about 40% of the area is under forest and 30% is under cultivable land. More than 80% area of the district lies with Vindhyan ranges (WHC of Soil 110-130mm) and only about 20% area of district lies under alluvial tract (WHC of soil 150-200mm). Industrialization and expansion of agriculture has occurred at very fast rate. This has caused rapid deforestation and degradation of natural ecosystem. Depletion of forest cover and expansion of marginal/sub-marginal lands are also due to unscientific expansion of agricultural activities and dependence of socio-economically backward inhabitants on biomass for their livelihood security. The existing biodiversities in the region is depleting very fast due to harvesting of biomass for food, fuel, fodder etc. and uncontrolled grazing. The cumulative effect of all these i.e. grazing, lopping, felling, unscientific agriculture is responsible for the turnover of patches leading to specific problems Degradation of soil fertility & productivity, degradation of natural forests, grazing lands and Extensive marginal and sub-marginal lands. Maximum animals of the district are non-descriptive, indigenous and less productive. This is mainly due to drought condition, lack of awareness regarding proper management and unavailability of better breeds. The average milk yield of a cow in this district is about 110 liters per lactation, where as in case of buffalo it is 430 liters. Goats and sheeps are more or

less average in size and weight. Further due to lack of knowledge about vaccination, proper feeding, health management, deworming is resulting in a number of diseases every year. There is a very good scope of goat rearing, sheep rearing, piggery, backyard poultry in the district. Goat productions in Vindhyanchal have mainly extensive, semi-intensive and intensive system. Semi-intensive production represents between extensive and intensive production and largely depends on the availability of land. Organized stall feeding is practically absent but during adverse climatic conditions farmers keep their goats in stall and fed with tree leaves, natural grasses and kitchen wastes.

2. Materials and Methods

This study was conducted in Mirzapur district. This has 12 development block out of which 5 was selected on the basis hilly region after this each block was divided on two strata and 5-6 villages were selected from each randomly out of 25 villages from the blocks and 5 farmers have been selected from each village on randomly basis then total farmers interviewed. Selection of variables eight variables viz. Age of first service, first kidding, Number of kidding, kidding interval, Number of kids, Gestation Length, Mortality rate and Sex ratio are presented in Table 1 respectively. A pre-tested structured interview schedule was prepared. Data was collected by personal interview method. Simple statistical tools like mean and standard deviation were used for interpretation of data. The respondents were divided into extensive, semi-intensive and intensive categories on the basis of mean and standard deviation of the total score.

3. Results

3.1 Age of first service

The age at first conception as reported by different system the present study the average age of first service found was 533±11.08 days under extensive condition, 496±3.99 days under semi-intensive condition and 518±8.23 days under Intensive System. This result is in agreement with the findings the average age at first conception was found Patel and pandey (2013) [18] observed the average age at first service indicates the reproductive potential of does. The overall means for age at first service in the study were found to be 560.43 ± 20.83 days. Waiz *et al.* (2018) [22] reported that the average age at first service estimated as 444.1±13.05 days.

3.2 Age at first kidding

In the present study the average age at first kidding found was 685±15.64 days under extensive condition, 644±22.85 days under semi-intensive condition and 666±15.4 days under Intensive System. Age at first kidding was observed lowest in the semi-intensive than extensive condition system. Thus, early age at first kidding reduces the cost of rearing replacements and increases economic returns and also facilitates rapid genetic progress and is therefore, highly desirable. Age at first kidding earlier to the present findings was reported by Kharkar *et al.* (2014) [13] in berari goats were 460.74±1.56 days. Lower values than the present findings have been reported Dhara *et al.* (2016) [6] Black Bengal goats were 376.64 days, 377.89 days and 379.17 days in West Bengal. Dana *et al.* (2015) [4] were 15.87±2.02 months in West Bengal.

3.3 Number of kidding

Number of kidding of Mirzapuri goats is presented in Table 4.9. Average Number of kidding was 10.04±0.79, 11.47±0.88 and 11.03±0.87 under extensive, semi-intensive and Intensive system, respectively. Number of kidding of Mirzapuri goats was higher under semi-intensive system than extensive system. This result is in agreement with the findings by Tsegaye (2009) [21] reported that Number of kidding in doe of Ethiopian goat is nearly similar with the study but higher which were 13.5±1.75 years and similar results found that Kidane *et al.* (2014) [14]. Asefa *et al.* 2015 [1] in the study area, the average offspring per doe is about 13.7 per life span. Mahilet (2012) [15] for Hararghae highland goats the life span of goat was 7.45 years.

3.4. Kidding Interval

Average kidding interval is shown in Table 4.9. In the present study the average kidding interval found was 334±14.24 days under extensive system, 285±13.48 days under semi-intensive system and 304±11.45 days under intensive system. Average kidding interval was lower under semi-intensive System than extensive system. Kidding interval was lower under semi-intensive may due to more nutritive stall feeding. The kidding intervals of less than these findings were reported to be Bhowmik *et al.* (2014) [2] in Jamunapari, Black Bengal and crossbred goats were 224.00 ± 14.42, 181.76 ± 15.81 and 199.17 ± 21.71 days, respectively. Dhara *et al.* (2016) [6] in Black Bengal goats (198.45 days, 199.11 days and 207.17 days) of T1, T2 and T3 respectively in west Bengal. Hasan *et al.* (2015) [10] Black Bengal goats in Bangladesh were 178.23±0.50 days under semi-intensive condition and 190.20±0.20 days under extensive condition. The kidding interval was found to be higher according to some reports viz; 300.27 ± 2.85 days and 364.82 ± 24.80 days in crosses of Sirohi with Beetal and Sirohi and Rai (2008), 400.30 ± 2.95 days in Pallai Adu goats Ravimurugan *et al.* (2008) [19].

Table 1: Mean (± SD) Reproductive Parameters of the Goat in Mirzapur District

Parameter		System			No. of observation		
		Extensive	Semi-Intensive	Intensive	Extensive	Semi-Intensive	Intensive
Age of first service (Day)		533±11.08	496±3.99	520±8.23	150	150	30
Age at first kidding (Day)		685±15.64	644±22.85	666±15.4	150	150	30
Number of kidding		10.04±0.79	11.47±0.88	11.03±0.87	150	150	30
Kidding interval (Day)		334±14.24	285±13.48	304±11.45	150	150	30
Number of kids		1.46±0.57	1.85±0.73	1.80±0.79	150	150	30
Gestation length (Day)		152±1.84	148±1.32	149±1.73	150	150	30
Mortality (%)		16.06±1.44	11.97±1.47	12.46±1.38	_	_	_
Sex ratio	Male	52.72±2.65	58.14±1.49	56.17±1.81			
	Female	47.28±3.46	41.86±2.89	43.83±1.95			

3.5. Number of kids (Litter size)

In the present study the average Number of kids (Litter size) found was 1.46±0.57 days under extensive system, 1.85±0.73 under semi-intensive system and 1.80±0.79 days under intensive system. Average Number of kids was higher under semi-intensive system than extensive system. The under of kid semi intensive group of higher than the extensive system and intensive system at par to semi-intensive. Deribe *et al.* (2014) [5] the litter size of 1.47+0.04 for kids. Miah *et al.* (2016) [16] reported was 2.13±0.102 and 1.59±0.109 in case of Black Bengal and Jamnapari goat, respectively under semi-intensive condition. Dana *et al.* (2015) [4] the average number of kids born per doe was 1.98, Hasan *et al.* (2015) [10] reported of Black Bengal goats in Bangladesh was 1.60±0.06 kg and 1.46±0.05 kg semi-intensive and extensive condition, respectively.

3.6 Gestation Length

Average gestation length is shown in Table 4.9. In the present study the average gestation length found was 152±1.84 days under extensive system, 148±1.32 under semi-intensive system and 149±1.73 days under intensive system. Average gestation length was lower under semi-intensive system than extensive system. Kharkar *et al.* (2014) [13] berari goats were 147.26±0.17 days. Miah *et al.* (2016) [16] Black Bengal goat was 147.90±0.25 days under semi-intensive condition. Dhara *et al.* (2016) [6] in Black Bengal goats 144.64 days, 144.89 days and 144.67 days of T1, T2 and T3 respectively in west Bengal. Faruque *et al.* (2010) [9] was 143.0 ± 1.71 and 142.8±1.4 days in intensive and semi-intensive system, respectively for Black Bengal goat. Higher gestation values than the observed results were recorded in various goat breeds. Bhowmik *et al.* (2014) [2] in Jamunapari were 151.71 ± 8.19. Hassan *et al.* (2010) [10] in Jamunapari goat were 152.8 ± 17.5 days. Khan and Khatun (2013) [12] in Black Bengal goat varied from 148 to 149 days. Fahim *et al.* (2013) [7, 8] in rohilkhand goats were 149.70±0.51 days.

3.7 Mortality rate

Mortality of Mirzapuri goats is presented in Table 4.9. Average mortality was 16.06±1.44, 11.97±1.47 and 12.46±1.38 per cent under extensive system, semi-intensive and intensive system, respectively mortality rate than the lower under semi-intensive system than extensive system. Higher Mortality rate than the observed results were recorded in various goat breeds. Singh *et al.* (2013) The average Mortality up to 3 months kids was 13 Per cent in Hamirpur and 12 Per cent in Mahoba district and Mortality among adults goats 10 Per cent in Hamirpur and 12 Per cent in Mahoba district of Bundelkhand. Hasan *et al.* (2015) [10] Mortality of kids of Black Bengal in Bangladesh was high in semi-intensive condition 13Per cent low mortality of kids under extensive condition 5 Per cent. Lower Mortality rate than the observed results were recorded in various goat breeds. Paul (2012) [17] reported that of Black Bengal goat in NBF was 10±0.02 Per cent. Hassan *et al.* (2010) [11] in farming conditions, mortality rate of Jamunapari goats was 7.7 Per cent. Prasad *et al.* (2013) Overall average mortality in kid and adult was 7.00±0.02 and 5.80±0.04 Per cent in Barbari and 5.50±0.09 and 4.20±0.05 Per cent in non-descript, respectively.

3.8 Sex ratios

Sex ratios of kids under extensive, semi-intensive and Intensive conditions were presented in Table 4.9. The sex ratio of male kid was 52.72±2.65, 58.14±1.49 and 56.17±1.81 under extensive, semi-intensive and Intensive condition. Sex ratio of male goat was higher under semi-intensive condition than extensive condition. The sex ratio of female kid was 47.28±3.46, 41.86±2.89 and 43.83±1.95 under extensive, semi-intensive and Intensive condition. Average sex ratio of female kid was higher under extensive System than semi-intensive system. The female kids sex ratio of extensive system higher than the semi intensive system and intensive system at par to extensive system. Therefore, from the above results it may suggest that the variation of sex ratio was not due to breed of goat. This study is similar reported that Hassan *et al.* (2010) [11] the sex ratio was 53.2 males: 46.8 females under farming conditions of Jamunapari goat. Hasan *et al.* (2015) [10] Black Bengal goats in Bangladesh were 56:44 under semi-intensive condition and 55: 45 under extensive condition.

4. Conclusion

Reproductive parameters of goats *i.e.* Age of first service, first kidding, Number of kidding, kidding interval, Number of kids (Litter size), Gestation Length, Mortality rate and Sex ratio. Results reported that the average age of first service found was 496±3.99 days under semi-intensive system. The age at first kidding found was 644±22.85 days under semi-intensive system. The number of kidding was 11.47±0.88 under semi-intensive system. The kidding interval was 285±13.48 days under semi-intensive system and non-significant effect on rearing system. The number of kids (Litter size) was1.85±0.73 days under semi-intensive system. The gestation length was a 148±1.32 days under semi-intensive System. The mortality was 11.97±1.47 per cent under semi-intensive system. The sex ratio of male kid was higher 58.14±1.49 under semi-intensive system. The sex ratio of female kid was higher 41.86±2.89 under extensive system. Similar study in larger area covering many states for longer duration can be undertaken in order to have a comprehensive view on goat production system in India.

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