

Growth performance of Jamunapari goats under the agro-climatic condition of Bihar

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The goat population in India and in Bihar is 124.36 m and 9.49 m, respectively (Agricultural Research Data Book 2007). As per FAO Bulletin of Statistics (2002), production of chevon is 0.47 m MT, which is 9.81% of national level (total meat production in India 4.79 m MT). Goat contributes 3.32 m MT milk (FAO Bulletin 2002) which is 3.95% of the national level (total milk yield in India 83.97 m MT). Goat milk is very rich in certain amino acids ie histidine, threonine, phenylalanine and certain minerals ie sodium, iron and copper. So, goat has the significant role in this region to bridge the gap of meat shortage for people of this region. Jamunapari goat is large dual purpose breed commonly found in this region. Realizing the importance of goat in this region, Jamunapari goat was introduced and productive performances were studied under this agro-climatic condition.

Jamunapari goats (40) were reared in semi-intensive system of management i.e. 7 - 8 hours grazing followed by stall feeding. Goats were housed in group, in semi-open shed with concrete floor and asbestos roof. Each goat was provided @ 1 m²/head during growing, @ 1.5 m²/head during adult and @ 2 m²/head during breeding stage. Besides grazing goats were fed concentrate mash feed consisting of 45% maize crust, 30% *masur chuni*, 20% *arhar chuni*, 2% mustard oil cake, 2% vitamin and mineral mixture and 1% common salt @ 100 g/head/day to grower, @ 150 g/head/day to adult and @ 200 g/head/day to breeder and nursing doe. Weaning was practised at 2 months of age. Regular deworming was done with broad spectrum anthelmintic. Selective pen mating was practised. Live weight of goats in different weeks, weekly weight gain and average daily gain under this housing, feeding and managerial condition were recorded. Meteorological parameters were also recorded regularly. Multiple regression analysis and ANOVA were done as per Snedecor and Cochran (1967).

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Live weight of goat increased gradually with significant ($P < 0.01$) difference between the weeks. Live weights of goat at 1st, 4th, 8th, 12th, 16th, 20th, 24th and 36th week were found to be 2.740 ± 0.073 , 4.960 ± 0.135 , 7.592 ± 0.210 , 9.692 ± 0.301 , 12.133 ± 0.203 , 14.233 ± 0.361 , 16.233 ± 0.405 and 20.233 ± 0.433 kg respectively. Khanna and Sahini (1983) found higher live weights at birth, 1 m, 2 m and 3 m of ages in comparison to present findings. However, present findings were better than the findings of Roy *et al* (1989) and Roy and Pant (2001). In the present finding goat attained a body weight of 20.233 kg at 9 m of age, which was attained at 1-year age as in the study of Roy *et al*. (1989). Roy *et al* (1989) reported that the least square means for weight of Jamunapari goat at birth, 3 m, 6 m, 9 m and 12 m of ages were 3.02 ± 0.04 , 8.74 ± 0.15 , 12.44 ± 0.28 , 16.31 ± 0.29 and 19.31 ± 1.38 kg respectively. Roy and Pant (2001) in another study indicated better performance of Jamunapari goat. Similar to live weight, significant ($P < 0.01$) difference was observed in weekly live weight gain and average daily gain. Weekly weight gain and average daily gain decreased gradually up to 8 weeks and then increased gradually up to 14th week, afterwards again decreased gradually up to 38th week. Highest growth was observed in the 1st week i.e. 134.07 ± 10.35 g/day with an overall mean of 79.19 ± 7.17 g/day. This finding corroborated with the finding of Roy and Pant (2001). Regular body measurements of goat were taken and it was found that with the advancement of age body length, body height and heart girth of goats increased gradually (Table 1). ANOVA of body length, body height and heart girth of goat was carried out between different age

Table 1. Body measurements of Jamunapari goat

Age (month)	Body length (cm)	Body height (cm)	Heart girths (cm)
0	32.60 ± 1.36	37.60 ± 1.44	36.80 ± 1.24
3	43.00 ± 1.22	48.00 ± 1.35	47.00 ± 1.09
6	47.00 ± 0.73	54.00 ± 1.59	56.33 ± 1.17
9	51.00 ± 1.23	60.86 ± 1.12	61.71 ± 1.89
12	54.86 ± 2.31	61.43 ± 2.61	62.29 ± 1.81

Table 2. Multiple regression analysis of WLW, WWG and ADG with different meteorological parameters

$$Y1 = -6.16 - 0.51 X1 - 0.08 X2 + 0.04 X3 - 0.18^* X4 + 0.69 X5 + 0.01^{**} X6 + 0.003 X7$$

$$Y2 = 1222.63 + 12.04 X1 - 18.53 X2 - 0.19 X3 + 6.33 X4 + 90.49 X5 - 0.17^* X6 + 4.41 X7$$

$$Y3 = 166.79 + 1.68 X1 - 2.61 X2 - 0.02 X3 + 0.94 X4 + 10.45 X5 - 0.02^* X6 + 0.63 X7$$

Where Y1 = WLW, Y2 = WWG, Y3 = ADG, X1 = MAXT, X2 = MINT, X3 = MRH, X4 = ERH, X5 = WS, X6 = SR, X7 = RF
 * => P < 0.05, ** => P < 0.01

groups and it was found that age had highly significant (P<0.01) effect on all the body measurements.

It was revealed that live weight, weight gain and average daily gain were significantly (P<0.05) correlated with maximum temperature, minimum temperature, morning RH, evening RH and solar radiation. Live weight was found negatively correlated with maximum temperature and relative humidity. Multiple regression analysis (Table 2) revealed that weekly live weight decreased significantly (P < 0.05) by 180 g per% rise of evening relative humidity and weekly weight gain reduced significantly (P < 0.05) by 0.17 g per unit increase of total solar radiation. Similarly average daily gain decreased significantly (P < 0.05) by 0.02 g per unit increase of total solar radiation. So, growth characteristics indicated that Jamunapari goats could be reared in the agro-climatic condition of Bihar. Proper shelter management should be practised to reduce the adverse effects of temperature, relative humidity and solar radiation as observed in the present study.

SUMMARY

Jamunapari (40) goats were maintained in goat farm of ICAR Research Complex for Eastern Region, Patna. Goats

were reared in semi-intensive system of Management. Goats were fed concentrate mash feed besides grazing. Highest growth was observed in the 1st week i.e. 134.07 g/day with an overall mean of 79.19 g/day. It was found that live weight, weight gain and average daily gain were significantly correlated with maximum temperature, minimum temperature, morning RH, evening RH and solar radiation, but non-significantly correlated with wind speed and rainfall. Weekly live weight of Jamunapari goat decreased significantly by 180 g per% rise of evening relative humidity. Average daily gain in grower and finisher goat were reduced by 46.11 g/d and 24.14 g/d respectively per °C rise of ET.

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