

# Management of browsers in ravinous eco-system for livelihood security of resource poor farm families

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## SUMMARY

A study was conducted in the ravinous ecosystem of Yamuna river catchment area of district Firozabad and Etawah of UP to assess the economic performance of browsers i.e. Jamunapari or jamunapari type goats. The sample villages were dominated by Jamunapari or jamunapari type goat followed by non-descript (Deshi). Three management systems viz., extension, semi-intension and intensive were taken into consideration. Significantly higher number of goat growers were feeding their goats in semi-intensive system as compared to extensive and intensive systems. Age at first puberty ( $433.0 \pm 18.9$  days) and conception ( $517.8 \pm 16.7$  days) of goat was significantly lower in semi-intensive system. Management systems had significant effect on the kidding interval. Lower kidding interval ( $314.2 \pm 8.7$  days) was also observed in semi-intensive system as compared to both the systems. The lactation length ( $190.0 \pm 35.4$  days) and lactation yield ( $1060.0 \pm 73.3$  g/day) of Jamunapari breed was significantly maximum in semi-intensive system. Management systems did not affect the birth weight of kid. Study concludes that management systems effect the economic traits of Jamunapari breed. Hence, it is suggested that benefited commercial production of Jamunapari may be achieved under semi-intensive system.

## Key words :

Management systems,  
Jamunapari,  
Economic traits

Goat, a dual purpose animal has been integrated in crop-animal production systems of resource poor farm families of ravinous areas. The goatary provides significant support to the economy of poor landless, small and marginal farm families of rural side of country in general and ravinous areas in particulars. Agro-climatic conditions of ravenous ecosystem of south western semi arid zone of UP are such that inspite of surplus and excess of green fodder during July to October, there is a large lean period of acute scarcity of green biomass during other months of the year. Hence, to sustain goat production in these area is very challenging job. To maintain ecological balance and increasing competition between human and animals for needed, nutrient is a matter of great concern. Therefore, an investigation was planned to assess the economic goat productivity in the ravinous ecosystems of Yamuna encatchment areas of south west semi-arid zone of U.P.

## MATERIALS AND METHODS

Investigation was conducted in five villages of ravinous area of south west semi-arid zone of U.P. The ecological condition of sample villages was semi-arid in nature having sandy

to sandy loam soil, erratic rainfall ranging from 493 to 804 mm. per annum followed by high air temperature during summer and fragile eco-system. The sample villages were also dominated by Jamunapari followed by Barbari and non-descript (Deshi). 100 goat growers having 1-50 goats of Jamunapari were selected for this study. The information on existing browse feed resources, management practices and economic traits of Jamunapari goat was collected by using participatory rural appraisal (PRA) tools and techniques. The green biomass generally consumed by goats was video-taped and representative samples of each tree/bush, grass and seasonal plant were collected and analysed for proximate principles as per AOAC (1980). The information on management practices and economic traits viz., age at first puberty (AFP), age at first conception (AFC), kidding interval (KI), gestation period (GP), lactation length (LL) and lactation yield (LY) of Jamunapari were compiled and statistically analysed as per Snedecor and Cockran (1967.)

## RESULTS AND DISCUSSION

The results obtained from the present investigation are summarized below :

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**Feed resources for goats:**

Information collected by transect walk of ravinous area revealed that there was four types of fodder plants trees, bushes, grasses and non-grass seasonal plants. Tree and bushes are generally used as top browse plants whereas grasses and seasonal plants as ground flora. The chemical composition of some of fodder plants/bushes and grasses which are generally consumed by goats have been depicted in Table 1. The crude protein and crude fibre contents of fodders are main criteria to assess their nutritive value. The crude protein content of browse plants was ranged from 6.9 to 18.2 per cent on dry matter basis where as in grasses, it varied from 5.3 to 8.2 per cent. The crude protein of seasonal plants varied from 11.9 to 16.4 per cent on dry matter basis. The crude fibre content of browse plants varied from 15.2 to 33.4 per cent on dry matter basis whereas, the crude fiber content of grasses and seasonal plants varied from 3.4 to 34.0 per cent. The ash content of green biomass ranged from 5.3 to 10.8 per cent on dry matter basis.

**Management systems for Jamunapari goat:**

The perusal of results (Table 2) indicates that the

goat growers were feeding their goats in three management systems viz., extensive, semi-intensive and intensive. In extensive management system, goats were kept on browsing 6-8 hrs daily where as in semi-intensive system, goats were supplemented kitchen wastes or uncrushed barley grains besides regular browsing 6-8 hr daily. In intensive system, goats were stall fed by Sani. (Sani is a mixture of dry fodder, green fodder and concentrates, kitchen waste and crushed grains). The significantly ( $P < 0.01$ ) higher per cent of goat growers were keeping their goats on semi-intensive management system of feeding. As the herd size decreased to one goat, farmers were shifted semi extensive to intensive system to avoid extra labour but as herd size increased beyond 15 goats, farmers used to feed their goat under extensive system.

**Economic traits of Jamunapari goat:**

The economic traits of goat are main criteria to assess their production and finally contribution of economy to the goat growers. Perusal of Table 3, envisages that Jamunapari female kid showed the sign of puberty earlier when managed under semi-intensive system ( $433.0 \pm 18.9$

**Table 1 : Chemical composition of browses plants**

Sr. No.	Name of plants	Chemical composition (% on dry matter basis)					
		OM	CP	CF	EF	NFE	ASH
Leaves of plants							
1.	<i>Acacia catechu</i>	91.6	11.9	23.9	4.3	51.5	8.4
2.	<i>Acacia nilotica</i>	94.6	7.1	33.1	2.4	52.0	7.4
3.	<i>Albezzia lebbek</i>	90.6	16.5	32.1	3.9	38.1	9.4
4.	<i>Azadirachta indica</i>	92.6	15.6	21.3	2.9	52.8	7.4
5.	<i>Dichrostachys nutans</i>	94.7	6.9	33.4	2.5	51.9	7.3
6.	<i>Engenia jamholana</i>	90.7	7.3	16.2	1.9	65.3	9.3
7.	<i>Ficus glomerata</i>	89.6	11.1	12.5	2.5	63.5	10.8
8.	<i>Ficus infectoria</i>	93.5	10.9	28.3	2.4	51.9	6.5
9.	<i>Ficus religiosa</i>	90.8	13.2	23.4	2.9	51.3	9.2
10.	<i>Ficus bengalensis</i>	91.6	10.1	28.0	2.7	50.8	8.4
11.	<i>Moringa oleifera</i>	90.0	18.2	18.9	2.6	50.3	10.0
12.	<i>Morus indica</i>	89.9	15.3	16.8	6.9	50.9	10.1
13.	<i>Prosopis cinararia</i>	94.8	13.1	25.3	4.5	51.9	6.2
14.	<i>Zizyphus mouratiana</i>	91.3	8.9	30.8	1.9	49.8	8.7
15.	<i>Zizyphus nummularia</i>	90.8	14.8	15.2	4.8	52.0	9.2
Grasses							
1.	<i>Cenchrus ciliaris</i>	93.1	8.2	3.4	2.1	50.3	6.9
2.	<i>Cynodon dactylon</i>	90.6	5.3	33.1	1.0	51.2	9.4
3.	<i>Panicum barbinode</i>	9.2	6.2	34.0	1.3	0.6	7.5
C. Succulent plants							
1.	<i>Dactyloctenium aegyptium</i>	91.7	11.9	30.1	2.9	49.8	5.3
2.	<i>Digera arvensis</i>	91.0	16.4	26.8	2.5	45.3	9.0
3.	<i>Tribullus terrestris</i>	93.5	12.4	30.1	2.4	48.6	6.5

**Table 2 : Management systems for feeding of Jamunapari goats**

Particulars	Per cent of respondents		
	Extensive	Semi-extensive	Intensive
Type of goats :			
Lactating goat**	19.75 <sup>b</sup>	66.00 <sup>a</sup>	14.25 <sup>c</sup>
Pregnant goat**	21.50 <sup>b</sup>	57.00 <sup>a</sup>	11.50 <sup>c</sup>
Dry goat**	43.25 <sup>a</sup>	55.00 <sup>a</sup>	1.75 <sup>b</sup>
Female Kids (3-9 Month aged)**	47.25 <sup>a</sup>	55.25 <sup>a</sup>	2.50 <sup>b</sup>
Castrated male kids (3-9 Month aged)**	44.75 <sup>a</sup>	50.75 <sup>a</sup>	4.50 <sup>b</sup>
Size of herd			
1**	00.00	65.35 <sup>a</sup>	34.52 <sup>b</sup>
1-5**	12.16 <sup>b</sup>	76.32 <sup>a</sup>	10.52 <sup>b</sup>
5-10**	36.00 <sup>b</sup>	64.00 <sup>a</sup>	00.00
10-15**	40.43 <sup>b</sup>	59.57 <sup>a</sup>	00.00
Above 15**	35.71 <sup>b</sup>	64.29 <sup>a</sup>	00.00

\* and \*\* indicate significant of values at P=0.05 and 0.01, respectively

days) as compared to intensive ( $460.5 \pm 10.6$  days) and extensive ( $490.6 \pm 15.5$  days) system of feeding. This might be due to availability of required balance nutrients and migratory habits of Jamunapari goat. The result of present investigation lies within range reported by Henrottee (1961), Singh and Senger (1980) and Khan *et al.* (1981). The age of first conception was  $590.0 \pm 10.5$ ,  $517.8 \pm 16.7$  and  $575.3 \pm 21.5$  days in extensive, semi-intensive and intensive system, respectively. The female kid conceived significantly ( $P < 0.01$ ) earlier when fed under semi-intensive system as kids attained the conceivable body weight earlier due to faster growth. The age of first conception in Jamunapari kid was reported by various workers (Devendra and Burn, 1970, Singh and Senger, 1970 and Singh and Senger, 1980) ranging from 533 to

755 days. The average age of first conception in present study was 561.0 days which was higher than age reported by Devendra and Burn, 1970. The age reported by Singh and Senger (1980) was 580.0 days which was closer to the present investigation. The gestation period in Jamunapari female in different management systems did not differ significantly ( $P > 0.05$ ) and mean of gestation period was 149.2 days which was similar to Singh and Senger (1980) and Khan *et al.* (1981). The kidding interval was  $340.6 \pm 16.5$ ,  $314.2 \pm 8.7$  and  $335.0 \pm 11.5$  days in extensive, semi-intensive and intensive system, respectively. The significantly ( $P < 0.01$ ) less kidding interval of female was recorded when kept under semi-intensive system.

The lactation length of Jamunapari female was significantly ( $P < 0.01$ ) longer in semi-intensive system ( $190.0 \pm 35.4$  days) as compared to extensive ( $154.0 \pm 10.3$  days) and intensive system ( $160.0 \pm 7.5$  days). The overall mean lactation length was 168.0 days. The lactation length of Jamunapari recorded by Singh and Senger (1970) and Devendra and Burn (1970) was similar to the present investigation. The milk yield was  $790.0 \pm 35.5$ ,  $1060.0 \pm 73.3$  and  $960.0 \pm 54.3$ g/day in extensive, semi-intensive and intensive system of feeding, respectively. The average milk yield was 936.6 g/day. The significantly ( $P < 0.01$ ) higher milk yield was recorded in semi-extensive system as compared to extensive and intensive system. The milk yield of Jamunapari goat was recorded by various workers (Agrawal, 1954, Khan *et al.*, 1981, and Singh and Senger, 1970) was ranged 0.94 to 3.6 Kg per day. Singh and Senger (1970) recorded milk yield of Jamunapari was 1.129 kg per day. However, Mahajan and Khan (1948) reported very high milk yield (2.7-3.6 kg/day) which was not observed in this tract. However, the milk yield was recorded in this tract was ranged between 0.650 to 1.50 kg per day which was

**Table 3 : Economic traits of Jamunapari goats under different management systems**

Particulars	Feeding system		
	Extensive	Semi-extensive	Intensive
Age at first puberty** (days)	$490.6 \pm 15.5$	$433.0 \pm 18.9$	$460.5 \pm 10.6$
Age at first conception ** (days)	$590 \pm 10.5$	$517.8 \pm 16.7$	$575.3 \pm 21.5$
Gestation period (days)	$149 \pm 0.5$	$149.0 \pm 0.5$	$149.5 \pm 0.5$
Kidding interval (days)*	$340.6 \pm 16.5$	$314.2 \pm 8.7$	$335 \pm 11.5$
Lactation length (days)**	$154.0 \pm 10.3$	$190.0 \pm 35.4$	$160.0 \pm 7.5$
Milk yield (g/d)**	$790. \pm 35.5$	$1060.0 \pm 73.3$	$960.0 \pm 54.3$
Kid weight			
Male	$3.35 \pm 0.10$	$3.60 \pm 0.18$	$3.65 \pm 0.15$
Female	$2.75 \pm 0.05$	$3.05 \pm 0.10$	$2.95 \pm 0.12$
Mortality %	$13.5 \pm 1.1$	$10.0 \pm 0.8$	$10.5 \pm 0.5$

\* and \*\* indicate significant of values at P=0.05 and 0.01, respectively

similar Devendra and Burn (1970). The body weight of male and female kid fed under different feeding systems did not differ significantly ( $P < 0.05$ ). The mean kid weight was 3.53 and 2.92 kg of male and female kid, respectively.

### Conclusion:

The ravinous ecosystem of Yamuna encatchment has excellent potential of naturally existing browse herbs round the year to the browsing of goat. In this ecosystem semi-intensive management system may be recommended for economic production of the Jamunapari breed.

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