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## Growth performance of Sirohi goat kids under different feeding management systems

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### Abstract

The present study was carried out at Livestock Research Station, Bojunda, Chittorgarh district of Rajasthan on twenty-one Sirohi goat kids of about 6 months' of age with uniform body weight. The overall average total body weight gain entire trial of Sirohi goat kids under extensive system (T<sub>1</sub>) group was recorded to be 2964 gm and semi-intensive system (T<sub>2</sub>) group was 3638.62 gm and intensive system (T<sub>3</sub>) group was recorded to be 4780.76 gm. Growth rate of intensive system (T<sub>3</sub>) group and semi-intensive system (T<sub>2</sub>) group was significantly ( $P < 0.01$ ) higher than extensive system (T<sub>1</sub>) group goat kids. Overall findings of the research, intensive and semi-intensive systems are the superior options for raising Sirohi goat breed.

**Keywords:** Average weekly gain, growth rate, intensive system, Sirohi goat

### 1. Introduction

The livestock sector contributes significantly to the agricultural economy of developing countries, with multipurpose products and uses such as skin, feathers, fibre, manure for fertiliser and fuel, power and transportation, as well as serving as a barter product in societies where currency is not circulated (Mordia *et al.* 2018) [6]. Goat is considered to be as one of the strongest animal and thrive under zero inputs and have rightly been quoted as "Poor Man's cow". Goats have proved financially valuable species in Indian agriculture. The goats are reared by a large number of landless labourers in the rural areas. Present goat population of India is 148.88 million. Rajasthan with 56.8 million livestock population shares more than 11 per cent of India's total livestock population and ranks 2<sup>nd</sup> in the country according to 20<sup>th</sup> Livestock Census. The goat is the major meat producing animal in India needs rather low investment for equipment and housing. Under Indian village conditions, goats are usually kept in kaccha sheds with an open enclosure of thorny shrubs. Goat is a multi-functional animal that plays an important role in the economy and nutrition of the country's landless, tiny and marginal farmers. The pure version of this breed can be found in the villages of Rajasthan's Sirohi, Ajmer, Udaipur, Chittorgarh, Rajsamand and Bhilwara districts, as well as neighboring Gujarat districts like Palanpur and Patan. The coat is mostly brown with bright or dark patches and only occasionally white. The size of the brown patches determines the breed's purity. The purity increases as the size decreases. In extensive system animals are allowed for grazing in the entire pasture for the whole season and this practice is quite predominant in migratory, free range, pasture and grazing system. In this method the cost of feed is very low and goats play only a secondary role to crop or other livestock production (Sahoo *et al.* 2019) [9].

### 2. Materials and Methods

The current study was conducted on twenty-one Sirohi goat kids of about 6 months' of age with uniform body weight. These goat kids were randomly divided into three groups of equal number (7 each). In group extensive (T<sub>1</sub>) kids were allowed to grazing for 8 hours in a day and housed in shed during night without any supplementary feed. Kids in semi-intensive (T<sub>2</sub>) group were allowed to grazing on "grasses" with concentrate supplementation. In intensive (T<sub>3</sub>) group animals were confined to the shed for entire period of study and reared on complete stall feeding with supplementation of commercial concentrate ration. All the experimental goat kids were identified by colour band and tag number. All the animals were dewormed 15 days before the start of the experimental trial. The kids were vaccinated again enterotoxaemia and pestes-des-petits as per the goat health calendar prescribed by LRS Bojunda.

The trial was carried out over a three-month period. Before beginning research, all three groups were given a 15-day pre-adoption period.

Experimental goat kids were weighed separately. The mean live body weight of each goat kid from the T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub> treatment groups were recorded using an electronic digital balance at weekly intervals on 7, 14, 21, 28, 35, 42, 49, 56, 63, 70, 77, 84 and 90 days during 90-days experimental period. Body weight gain (g) was the rate of gain per week over a specified period of time and was calculated from difference in body weight attained between the two body weight recordings. The data obtained during this experiment were statistically analysed in one way ANOVA according to Snedecor and Cochran (1994) [11] and significance of mean differences were compared by Duncan's new multiple range tests (DNMRT) as modified by Kramer (1957) [3].

### 3. Results and Discussion

#### 3.1 Growth Performance

##### 3.1.1 Average weekly body weight gain

The data of average weekly body weight gain (g/wk) of Sirohi goat kids under different feeding management systems have presented in Table 1.

**Table 1:** Average weekly body weight gain (g/wk) of Sirohi goat kids under different feeding management systems.

Weeks	roupT <sub>1</sub>	GroupT <sub>2</sub>	GroupT <sub>3</sub>	SEM
1	214.29	242.86	280.00	17.93 <sup>NS</sup>
2	222.86 <sup>a</sup>	255.00 <sup>ab</sup>	280.00 <sup>b</sup>	13.30 <sup>*</sup>
3	231.43 <sup>a</sup>	291.43 <sup>a</sup>	343.58 <sup>b</sup>	19.32 <sup>**</sup>
4	242.29 <sup>a</sup>	305.72 <sup>b</sup>	367.15 <sup>c</sup>	12.07 <sup>**</sup>
5	238.58 <sup>a</sup>	271.43 <sup>b</sup>	402.86 <sup>c</sup>	20.57 <sup>**</sup>
6	237.15 <sup>a</sup>	291.43 <sup>b</sup>	377.15 <sup>c</sup>	13.69 <sup>**</sup>
7	238.58 <sup>a</sup>	271.43 <sup>a</sup>	402.86 <sup>b</sup>	14.85 <sup>**</sup>
8	201.43 <sup>a</sup>	237.15 <sup>ab</sup>	310.00 <sup>b</sup>	27.22 <sup>*</sup>
9	227.15 <sup>a</sup>	271.43 <sup>b</sup>	325.72 <sup>c</sup>	14.62 <sup>**</sup>
10	205.72 <sup>a</sup>	308.58 <sup>b</sup>	407.15 <sup>c</sup>	17.03 <sup>**</sup>
11	215.72 <sup>a</sup>	263.58 <sup>a</sup>	390.00 <sup>b</sup>	20.26 <sup>**</sup>
12	237.86 <sup>a</sup>	310.00 <sup>a</sup>	461.43 <sup>b</sup>	22.90 <sup>**</sup>
13	250.72 <sup>a</sup>	318.58 <sup>b</sup>	432.86 <sup>c</sup>	11.59 <sup>**</sup>
Total gain	2964.00 <sup>a</sup>	3638.62 <sup>b</sup>	4780.76 <sup>c</sup>	17.33 <sup>**</sup>

a,b,c Means with different superscripts in a row differ significantly. NS = Non-significant, \* = Significant, \*\* = Highly Significant

The average weekly body weight gain (g/wk) of Sirohi goat kids under extensive (T<sub>1</sub>) feeding management systems for the period of 1-13 weeks were 214.29, 222.86, 231.43, 242.29, 238.58, 237.15, 238.58, 201.43, 227.15, 205.72, 215.72, 237.86 and 250.72 (g/wk), respectively. The overall body weight gain of Sirohi goat kids under extensive feeding management system for entire period of trial was recorded to be 2964.00 gms.

The average weekly body weight gain (g/week) of Sirohi goat kids under semi-intensive (T<sub>2</sub>) feeding management system for the period of 1-13 weeks were 242.86, 255.00, 291.43, 305.72, 271.43, 291.43, 271.43, 237.15, 271.43, 308.58, 263.58, 310.00 and 318.58 (gms/wk), respectively. The overall body weight gain of Sirohi goat kids under semi-intensive feeding management system for entire period of trial was recorded to be 3638.62 gms.

The average weekly body weight gain (g/week) of Sirohi goat kids intensive(T<sub>3</sub>) feeding management system for the period of 1-13 weeks were 280.00, 280.00, 343.58, 367.15, 402.86, 377.15, 402.86, 310.00, 325.72, 407.15, 390.00, 461.43 and 432.86 (gms/wk), respectively. The overall body weight gain

of Sirohi goat kids under intensive feeding management system for entire period of trial was recorded to be 4780.76 gms.

The highly significant difference ( $P < 0.01$ ) was observed for weekly total body gain of Sirohi goat kids among different feeding management systems. T<sub>3</sub> group have significantly ( $P < 0.01$ ) higher growth rate than T<sub>2</sub> and T<sub>1</sub> groups. T<sub>2</sub> group have significantly ( $P < 0.01$ ) higher growth rate than T<sub>1</sub> group. Non-significant difference was observed for weekly weight gain of Sirohi goat kids among different feeding system in 1<sup>st</sup> week of experiment and highly significant from 3<sup>rd</sup> to 13<sup>th</sup> weeks of experiment, except 2<sup>nd</sup> and 8<sup>th</sup> weeks of experiment. The results of body weight gain are in accordance to Sahu *et al.* (2013) [10], Patil *et al.* (2014) [8], Pathan *et al.* (2017) [7], Mahanthes *et al.* (2019) [5] and Karthik *et al.* (2021) [2]. On the contrary, these findings are contraindicated to findings of Legesse *et al.* (2013) [4] and Debbarma *et al.* (2018) [1].

Significantly ( $P < 0.01$ ) higher growth rate was detected in intensive system (T<sub>3</sub>) as compared to other feeding management systems. In the current study, this could be due to availability of plenty amount of feed and more comfortable climatic conditions to intensive group. In other groups, kids were on grazing after rainy season with sufficient availability of grasses, but they were low in nutritive value as compare to concentrate feed with poor digestibility. Therefore, kids could not achieve optimum growth rate. Semi-intensive group (T<sub>2</sub>) also show significantly ( $P < 0.01$ ) higher weight gain than extensive group (T<sub>1</sub>).

#### 4. Conclusions

There was a higher significant effect of different feeding management systems on growth performance of Sirohi goat kids. The growth performance and daily feed intake was significantly ( $P < 0.01$ ) higher in intensive group (T<sub>3</sub>) and semi-intensive (T<sub>2</sub>) group than extensive (T<sub>1</sub>) group. Therefore, based on the overall findings of the research, intensive and semi-intensive systems are the superior options for raising Sirohi goat breed.

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