



SHORT COMMUNICATION

Growth Performance and Nutrient Utilization in Different Goat Breeds in the Plain Agro-climatic Zone of Chhattisgarh

Raj Kumar Yadav, Meenu Dubey*, Raina Doneria and S.P. Tiwari

Department of Animal Nutrition, College of Veterinary Science and Animal Husbandry,
Anjora, Durg, 491001, Chhattisgarh, India

ABSTRACT

Growth performance and nutrient utilization was studied in three goat breeds in the plain agro climatic zone of Chhattisgarh. Five kids (4-5 months of age) each of Jamunapari, Barbari and Sirohi breed were reared in three groups under semi intensive system of goat production. Kids were allowed grazing for 4-5 h followed by concentrate mixture feeding @ 100, 150 and 200 g/d/ kid in the evening for 1st, 2nd and 3rd month of experiment, respectively. The average daily gain was similar in Jamunapari (47.50 g), Barbari (45.83 g) and Sirohi (39.30 g) kids. The digestibility of CP was higher ($P<0.05$) in Jamunapari (72.17%) and Barbari (70.52%) compared to Sirohi kids (65.17%). Similarly, the digestibility of CF, EE and NFE was better ($P<0.05$) in Jamunapari compared to Sirohi. Jamunapari and Barbari kids showed better N retention than Sirohi kids. The retention of P was also higher ($P<0.05$) in Jamunapari compared to Sirohi breed. It might be concluded that the growth performance and efficiency of nutrient utilization was better in Jamunapari and Barbari breed in comparison to Sirohi breed in plain region of Chhattisgarh.

Key words: Barbari, Goats, Growth performance, Jamunapari, Nutrient utilization, Sirohi

Goats occupy a unique place among domestic livestock because of their ability to survive and produce under extreme climatic and management conditions. Goats play an important role to small-scale resource poor livestock keepers, efficient utilization of feed resources, small size and early maturity, short generation interval and higher digestion efficiency of roughage make them suitable for small land holders for income generation, increased farm productivity and for improved family nutrition. Therefore, improvement of goat productivity is one way of reducing poverty among the poor's (Ahuya *et al.*, 2009). Chhattisgarh state has wide variations in climate and geology and the state has been divided in three agro-climatic zones *i.e.* Northern hill, plain and plateau. Variation in soil type affects the vegetation of respective area and nutritive value of grown crop which ultimately affect the population and performance of animal to a great extent. Various studies showed that a number of environmental factors affect the growth and lactation traits and thus directly obscure the recognition of the genetic potential of animals. Present experiment was conducted to assess

the growth performance and nutrient utilization in Jamunapari, Barbari and Sirohi breeds of goat kids in plain agro climatic zone of Chhattisgarh.

For this study, five kids of each breed (Jamunapari, Barbari and Sirohi) of 4-5 months age were raised in three groups. A feeding cum growth trial was conducted for 90 days. The kids were housed in a well-ventilated goat shed with facilities for individual feeding under hygienic conditions and maintained under semi-intensive system of goat kid production. All kids were dewormed by Albendazole @ 7.5 mg/kg BW orally. The kids were allowed to graze on pasture grass available in the agro climatic zone for 4-5 h and in the evening concentrate mixture was offered @ 100, 150 and 200 g/d/kid during 1st, 2nd and 3rd month of feeding, respectively. Concentrate mixture contained (parts) maize 44, deoiled soybean cake 18, deoiled rice bran 26, wheat bran 10 along with premixes (2 parts) containing vitamins, minerals and feed additives. The concentrate mixture contained 16% DCP and 70% TDN.

The kids were weighed at fortnightly intervals and average daily gain was calculated. After 90 days of

*Corresponding author: E- mail: drmeenu.dubey@gmail.com

feeding, a metabolism trial of 5 days collection period was conducted to determine digestibility of nutrients, N, Ca and P balances. The kids were kept individually in the metabolic cage having provision for individual feeding and collection of faeces and urine separately. During metabolism trial, animals were not allowed to graze and weighed quantity of feed was offered daily in the morning at 8.00 A.M. and evening at 4.00 PM. The left over feed was collected daily and weighed. Samples of feed offered, residue left and faeces voided were analyzed for proximate principles (AOAC, 2000). The samples were also analyzed for calcium (Talapatra *et al.*, 1940) and inorganic phosphorus (Fiske and Subbarow, 1925). The data were subjected to analysis of variance following Completely Randomized Design as per Snedecor and Cochran (1994) and significance of differences among groups was analyzed by Duncan multiple range test using SPSS software.

The results showed that initially up to 45 day no significant difference in the average daily weight gain (ADG) among the breeds was observed, however, between 45-60 days, the highest ADG was recorded in Jamunapari (53.33 g) followed by Barbari (50.00 g) kids which was higher ($P<0.01$) than in Sirohi (35.33 g) kids (Table 1). Similarly, during the last fortnight weight gain was higher ($P<0.05$) in Barbari and Jamunapari as compared to Sirohi kids. Mean ADG was, however, similar in different groups. The weight gain during 90 d trial period in Jamunapari, Barbari and Sirohi was 4.28, 4.13 and 3.54 kg, respectively. The total weight gain was similar in 3 groups. In present study, the growth

performance of Jamunapari and Barbari kids was similar. The ADG of Jamunapari kid (47.50 g) in the present study corroborated with findings of Das and Yadav (2015) and Khan and Naznin (2013) under semi intensive system of goat kid production. The ADG of Barbari kid (45.83 g) in this study was lower than 66.22 g/d as reported by Paramasivam *et al.* (2002) under semi intensive conditions. In contrast, Bharathidhasan *et al.* (2009) reported that there was no significant effect of non-genetic factors on early production parameters of the Barbari goats.

The DM intake was found to be similar in 3 groups. The digestibility of CP was higher ($P<0.05$) in Jamunapari and Barbari as compared to Sirohi kids. The CF digestibility was also higher ($P<0.05$) in Jamunapari as compared to Sirohi kids though the variation in CF digestibility between Barbari and Sirohi kids was not significant. The digestibility of EE and NFE was higher in Jamunapari as compared to Sirohi, though the value differed non-significantly between Barbari and Sirohi. The reason for increased digestibility of CP, EE, CF and NFE in Jamunapari kid might be due to better adaptability of this breed in the agro climatic condition of Chhattisgarh state. Chaturvedi *et al.* (2010) also reported that the digestibility of DM, OM, CP, NDF and ADF was higher in group where lambs were maintained on grazing and concentrate supplementation as compared to group where lambs were maintained on sole grazing. The N retention was higher ($P<0.05$) in Jamunapari and Barbari goats as compared to Sirohi (Table 2). The Ca retention was

Table 1. Average daily weight gain (g/d) in kids of Jamunapari, Barbari and Sirohi breeds in plain region of Chhattisgarh

Period (d)	Group			Level of significance
	Jamunapari	Barbari	Sirohi	
0-15	37.33±2.41	38.66±4.23	32.66±3.78	NS
15-30	46.00±4.23	42.66±3.78	42.66±4.28	NS
30-45	50.66±5.29	43.33±4.68	45.33±2.12	NS
45-60	53.33 ^a ±2.12	50.00 ^a ±5.67	35.33 ^b ±5.12	**
60-75	46.66±6.46	48.66±3.39	40.00±4.17	NS
75-90	50.66 ^a ±4.78	52.66 ^a ±4.19	40.66 ^b ±5.12	*

Table 2. DM intake and nutrient utilization in goat kids in plain agro climatic zone of Chhattisgarh

Particular	Group			Level of significance
	Jamunapari	Barbari	Sirohi	
DM intake				
DMI (g/d)	489.25±49.96	421.97±73.98	389.33±20.96	NS
DMI (kg/100 kg BW)	4.08	4.20	3.12	NS
Digestibility (%)				
DM	62.63±0.37	62.02±0.49	61.41±0.34	NS
CP	72.17 ^a ±0.45	70.52 ^a ±0.21	65.17 ^b ±1.31	*
CF	68.74 ^a ±1.29	65.84 ^{ab} ±2.19	61.83 ^b ±1.83	*
EE	66.32 ^a ±2.59	64.05 ^{ab} ±1.27	58.33 ^b ±2.55	*
NFE	65.34 ^a ±2.04	63.35 ^{ab} ±0.74	58.84 ^b ±2.04	*
Nutrient retention (%)				
N	72.18 ^a ±0.45	70.55 ^a ±0.21	65.19 ^b ±1.30	*
Ca	64.30±2.45	62.00±2.89	58.82±5.55	NS
P	69.53 ^a ±3.39	65.15 ^{ab} ±2.11	58.97 ^b ±2.38	*

^{a,b} Means with different superscript in a row differ significantly (*P<0.05, NS- not significant)

similar in 3 groups. The retention of P was higher (P<0.05) in Jamunapari as compared to Sirohi though the difference between Barbari and Sirohi was not significant.

It could be concluded that the growth performance and nutrient utilization was better in Jamunapari and Barbari kids as compared to Sirohi kids in plain region of Chhattisgarh.

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