

Performance of Growing Sirohi Goats on Azolla (*Azolla Pinnata*) Based Diet

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ABSTRACT

The present study assessed the effect of replacing concentrate mixture with sun-dried Azolla on voluntary feed intake and growth performance in Sirohi goats. Twelve male Sirohi growing goat kids of 6 to 9 months of age with uniform body weight were divided into two groups, control, and treatment, consisting of six animals in each group. The animals kept in group T₁ were allowed to browse on jungle grasses with 200 g concentrate mixture per day per animal, whereas in group T₂, 10 % of the concentrate mixture was replaced with sun-dried azolla. Weekly feed intake and body weights were recorded to assess the growth rate of goats. Results revealed that goats' average weekly feed intake and body weight were comparable and statistically similar in both groups. The average daily gain (g) in the bodyweight of a control group (51.79) and experimental group (65.60) was statistically similar but numerically higher in the treatment group. In conclusion, supplementation of sun-dried azolla meal improved the performance of Sirohi goat without any detrimental effect on voluntary feed intake and health.

Keywords: Azolla meal, Browsing, Concentrate, Growth performance, Sirohi goats.

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INTRODUCTION

Goat is one of the major livestock species contributing to livelihood and nutritional security. Goat rearing has the potential to emerge as a very good source of income and employment for the rural youth, especially in adverse environments. Sirohi goats are valuable germ-plasm because of their better performance in harsh climatic conditions (Sharma *et al.*, 2016 and 2020). Sirohi goats are dual-purpose animals, being reared for both milk and meat. There is huge potential in enhancing the productive performance of goats through nutritional interventions. Various newer and non-conventional feeds may be incorporated for goat feeding such as *Azolla pinnata*, which could be used as an ideal feed replacement for livestock (Pillai *et al.*, 2009). Azolla can act as a valuable green feed supplement for dairy cattle to improve productivity in terms of growth, milk, meat, etc., particularly where the availability of green fodder is limited (Chatterjee *et al.*, 2013). However, there is very limited data on the impact of supplementing *Azolla pinnata* on growth performance of Sirohi goat kids. Therefore, the present work was planned to study the effect of *Azolla (Azolla pinnata)* feeding on voluntary dry matter intake and growth performance in Sirohi kids.

MATERIALS AND METHODS

For the present research, approval from the institutional animal ethical committee was obtained. The experiment was conducted on twelve Sirohi goat kids of 6 to 9 months age maintained at Goatry Unit, Livestock Farm Complex, College of Veterinary Science and AH, Mhow (MP) during

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the year 2019–20. The Azolla (*Azolla pinnata*) culture was obtained from Kasturba Gandhi National Memorial Trust, Kasturbagram, Indore (MP) and cultivated on a large scale on polythene sheets. It was harvested, and dried ground Azolla was analyzed for crude protein, ether extract, crude fiber, and ash on a dry matter basis as per the standard methods (AOAC 1995).

The selected kids were randomly divided in two groups (n = 6 each) based on body weight, as control (T₁) and experimental (T₂) groups. The animals kept in group T₁ were allowed to browse on jungle grasses for 8 hrs daily with readymade concentrate mixture (200 g/day/animal) feeding in the stall, whereas the goats in T₂ group were allowed

Table 1: Effect of Azolla meal supplementation on weekly feed intake (kg/d), body weight change (kg), and gain in body weight (g/d) of Sirohi goat kids

Experimental period (Wk)	Weekly feed intake (kg/d)		Weekly body weight (kg) changes		Average daily gain in B.Wt. (g/d)	
	T ₁ (control)	T ₂ (treatment)	T ₁ (control)	T ₂ (treatment)	T ₁ (control)	T ₂ (treatment)
Initial	0.83 ± 0.11	0.82 ± 0.12	15.57 ± 0.46	15.27 ± 0.51	50.81 ± 1.05	53.50 ± 1.33
1	0.82 ± 0.11	0.82 ± 0.11	15.92 ± 0.46	15.64 ± 0.51	52.79 ± 1.14	55.90 ± 1.46
2	0.87 ± 0.12	0.87 ± 0.13	16.29 ± 0.46	16.03 ± 0.50	51.90 ± 1.08	57.43 ± 1.21
3	0.89 ± 0.13	0.94 ± 0.14	16.66 ± 0.46	16.43 ± 0.50	50.36 ^b ± 1.24	64.19 ^a ± 1.37
4*	0.97 ± 0.08	0.93 ± 0.11	17.01 ± 0.47	16.88 ± 0.50	47.98 ^b ± 1.14	61.36 ^a ± 1.33
5*	0.96 ± 0.12	0.94 ± 0.13	17.34 ± 0.47	17.31 ± 0.51	52.02 ± 1.28	63.38 ± 1.46
6	0.98 ± 0.08	0.94 ± 0.10	17.71 ± 0.47	17.76 ± 0.51	50.98 ± 0.77	66.33 ± 1.07
7	0.96 ± 0.11	1.03 ± 0.13	18.06 ± 0.47	18.22 ± 0.51	53.62 ± 1.44	68.55 ± 1.40
8	1.01 ± 0.12	1.05 ± 0.12	18.44 ± 0.47	18.70 ± 0.52	48.83 ^b ± 1.28	66.95 ^a ± 1.05
9**	1.04 ± 0.12	1.05 ± 0.14	18.78 ± 0.47	19.17 ± 0.52	52.86 ^b ± 1.21	70.67 ^a ± 1.31
10**	1.07 ± 0.12	1.05 ± 0.13	19.15 ± 0.47	19.66 ± 0.52	49.81 ^b ± 1.08	69.21 ^a ± 1.19
11**	1.10 ± 0.12	1.13 ± 0.15	19.50 ± 0.46	20.15 ± 0.52	50.83 ^b ± 1.16	73.02 ^a ± 1.22
12**	1.11 ± 0.11	1.13 ± 0.11	19.86 ± 0.46	20.66 ± 0.52	60.47 ^b ± 1.44	82.31 ^a ± 1.17
13**	1.12 ± 0.12	1.24 ± 0.14	20.28 ± 0.47	21.24 ± 0.51	51.79 ± 0.49	65.60 ± 0.77
Overall	0.98 ± 0.08	1.00 ± 0.09	17.90 ± 0.33	18.08 ± 0.37	50.81 ± 1.05	53.50 ± 1.33

* Significant ($p < 0.05$), ** Highly significant ($p < 0.01$), Means with different superscripts within the row differ significantly ($p < 0.05$).

to browse on jungle grasses for 8 hours daily along with concentrate mixture in a stall, of which 10 % was replaced with sun-dried Azolla. The animals were maintained under proper managerial conditions. Drinking water was provided two times *ad lib* during the confined hours of the day. The experiment was conducted for a period of three months (90 days).

The body weights of the animals were recorded at the weekly interval in the morning starting from day 0, following standard norms. After browsing on that day, the goats were also weighed to know the total feed intake of goats in a day.

The data collected during the experiment were subjected to an independent T-test (Snedecor and Cochran 1994).

RESULTS AND DISCUSSION

Chemical Composition of Azolla

The chemical analysis of sun-dried and ground Azolla showed that it contained 23.71 % crude protein, 3.40 % ether extract, 13.06 % crude fiber, and 17.80% ash on a dry matter basis.

Our observations on the proximate composition of Azolla were in agreement with the reports of Ara *et al.* (2015).

Effect of Azolla Meal Supplementation on Voluntary Feed Intake, Body weight, and Average Daily Gain

The results on the effect of Azolla meal supplementation in the concentrate mixture of goats are presented in Table 1. There was no significant difference in voluntary feed intake and body weight among the treatment and control groups overall or in any of the weeks during the experiment.

The overall mean bodyweight of the experimental period was 17.90 and 18.08 kg in the T1 and T2 groups, respectively.

These observations suggested that supplementation of Azolla meal had no adverse effect on body weight gain. Similarly, Kumar *et al.* (2012) and Kumar *et al.* (2017) observed non-significant effect of Azolla supplementation on periodical body weight changes in buffalo bulls and male kids, respectively.

In the present experiment, The average daily gain was significantly higher in treatment group T2 at the 4th, 5th, 9th, 10th, 11th, 12th and 13th week of the experiment compared to the control group. Overall average daily gain (g) of control group (51.79 ± 0.49) and experimental group (65.60 ± 0.77) was statistically similar but numerically higher in treatment group T2 (Table 1). Similar findings were reported by Jyoti *et al.* (2016) and Toradmal *et al.* (2017) in kids. Thus, it was concluded that Azolla (*Azolla pinnata*) supplementation in a concentrate diet resulted in higher average daily gain in Sirohi kids. Contrary to the present study Ahmed *et al.* (2016) reported a non-significant effect of feeding Azolla on ADG in Corriedale sheep.

CONCLUSION

From the results, it can be inferred that the supplementation of sun-dried Azolla meal (@ 10% replacement of concentrate feed) improved the performance of Sirohi goat kids in terms of ADG without any detrimental effect on voluntary feed intake and health.

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