

FEEDING OF FRESH AZOLLA (*Azolla pinnata*) ON GROWTH PERFORMANCE OF MALE GOAT KIDS OF OSMANABADI GOAT

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ABSTRACT

The research work entitled “Feeding of fresh Azolla (*Azolla pinnata*) on growth performance of male goat kids of Osmanabadi goat” was carried out at Animal Husbandry and Dairy Science Section, College of Agriculture, Nagpur for period of 63 days during the year 2023-24. Experimental kids were fed with three different dietary levels of fresh Azolla i.e. control, 100 g and 200 g kid⁻¹ day⁻¹ along with recommended concentrate mixture and dry roughage ad libitum (Gram straw) in addition to natural grazing to determine the dry matter intake (DMI) and cost of feeding. It was noticed that fresh Azolla was reasonably good source of energy and high source of crude protein (23.45) in the Osmanbadi male goat kids feeding. The experimental kids under the treatment T3 - 4 hrs grazing + concentrate mixture of 150 g + fresh azolla 100 g + ad libitum gram straw showed significantly higher (0.688 kg day⁻¹ kid⁻¹) DM intake day⁻¹ as compared to the treatments T2 - 4 hrs grazing + concentrate mixture of 150 g + fresh azolla 100 g + ad libitum gram straw and T1 - Natural grazing + recommended dose of concentrate mixture 200 g + ad libitum gram straw.

The cost of feeding day⁻¹ goat⁻¹ was lowest in treatment T3 (Rs. 249.48), as compared to T2 (Rs. 325.08) and T1 (Rs. 402.57) indicated that higher amount of Azolla (T3) used in goat feeding reduced the cost of feeding. Thus, it can be inferred that experimental kids can be efficiently raised on Azolla containing diet as evident from Dry Matter Intake (DMI).

(Key words : *Azolla pinnata*, chemical composition, dry matter intake, cost of feeding)

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 (Dev *et al.*, 2022). Osmanabadi goat breed is primarily raised for meat production. The breed is considered useful both for meat and milk. Average meat yield is 40 to 45% and milk production is 180 lits in 210 days of lactation period. This breed holds significant market demand for its meat among the registered goat breeds in India, reflecting the preference for Osmanabadi goat meat.

Growth is a basic and shared characteristic of all living things. Every animal has a specific amount of growth and production potential of these hereditary traits can only be realized with appropriate management and nutrition to achieve sufficient growth. Genetics only account for thirty per cent growth, the remaining seventy per cent is determined by nutrition and management. Fodder and feed are used to supply protein source to the animals and also supplying energy, water, vitamins, minerals, different type's essential and non-essential amino acids. The search for alternatives to concentrates led to a wonderful plant Azolla,

which the promise of providing a sustainable feed for livestock.

MATERIALS AND METHODS

The present investigation on studies on feeding of fresh Azolla (*Azolla pinnata*) on growth performance of male goat kids of Osmanabadi goat was conducted at Animal Husbandry and Dairy Science Section, College of Agriculture, Nagpur for period of 63 days. Six Osmanabadi goat kids between the age group of 6 to 9 months and weighing between 12 to 15 kg were divided into 7 equal groups of 2 goat kids, in such a way that all the group were having approximately same body weight at the beginning of experiments. The dietary treatments were T1 - Natural grazing + recommended dose of concentrate mixture 200 g + ad libitum gram straw, T2 - 4 hrs grazing + concentrate mixture of 150 g + fresh azolla 100 g + ad libitum gram straw and T3 - 4 hrs grazing + concentrate mixture of 100 g + fresh azolla 200 g + Ad libitum gram straw. The experimental animals fed as per feeding standard to meet the nutrient requirement Anonymous (1985). The dry matter, crude protein, crude fiber, ether extract and total ash for the samples were determined as per procedures given for proximate principles analysis according to Anonymous (1990). The data were

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Table 1. Chemical composition of experimental feeds fed to Osmanabadi goat kids (per cent on DM basis)

Sr. No.	Attributes	Concentrate mixture	Roughages	
			Azolla	Gram straw
1	DM	90.85	04.23	92.18
2	CP	18.20	23.45	06.05
3	CF	09.37	14.60	34.30
4	EE	07.99	03.80	05.50
5	NFE	55.36	33.63	46.15
6	Ash	08.36	24.22	08.00

Table 2. Mean daily dry matter intake by experimental animals on different treatments (kg)

Treatments	Avg. body wt. (kg)	DM intake (kg day ⁻¹)	DM intake 100 kg ⁻¹ body wt.
T ₁	14.77	0.660	4.75
T ₂	14.80	0.685	4.93
T ₃	14.87	0.688	4.94
SE(m)±	0.07	0.02	0.18
CD at 5% level	0.21	—	0.54

Table 3. Cost of feeding under different groups

Feeds	Treatments		
	T ₁	T ₂	T ₃
Azolla (g)	-	100	200
Gram straw (g)	250	235	225
Concentrate (g)	200	150	100
Total feed day ⁻¹ (kg)	0.450	0.485	0.525
Cost of feed day ⁻¹ (Rs.)	6.39	5.16	3.96
Cost of feed for 63 days (Rs.)	402.57	325.08	249.48

* Excluding cost of grazing

arranged in switch over design and analyzed by standard statistical method LSD with seven replications (Amble, 1975).

RESULTS AND DISCUSSION

Chemical composition

Data regarding chemical composition of feedstuffs used in experimental period for feeding the goat kids are tabulated in Table 1.

It is observed from Table 1 that, Azolla had higher CP content (23.45%) than concentrate mixture (18.20%) and gram straw (06.05%). The above result indicates that Azolla contained more protein than concentrate mixture and gram straw. However, CF content in Azolla and gram straw were 14.60 and 34.30 per cent while that of concentrate mixture it was 09.37 per cent. Moreover, the EE and NFE content of concentrate mixture was more than the content of Azolla and gram straw. The ash per cent of Azolla and gram straw were 24.22 and 08.00 and in concentrate mixture it was 08.36 per cent.

More or less similar results were reported by Prasad *et al.* (2021), who noted 84.95 per cent organic matter, 23.74 per cent crude protein, 4.09 per cent ether extract, 14.25 per cent crude fiber, 34.96 per cent nitrogen free extract, 15.05 per cent total ash, 1.69 per cent calcium and 0.54 per cent phosphorus in azolla. Thus, it can be inferred from Table 1 that Azolla is reasonably good source of energy and high source of protein to the animals.

Daily Dry Matter Intake (DMI)

The mean values of daily dry matter intake in Osmanabadi goat kids in three different treatments are presented in Table 2.

The dry matter is the most important component of the feeds and fodder. It excludes the moisture content of feed and fodder. The feed requirement of animal is based on the DM content of feed.

The values of daily dry matter intake of the treatment T1 (Natural grazing + recommended dose of concentrate mixture 200 g + ad libitum gram straw), T2 (4 hrs grazing + concentrate mixture of 150 g + fresh azolla 100 g + ad libitum gram straw) and T3 (4 hrs grazing + concentrate mixture of 100 g + fresh azolla 200 g + Ad libitum gram straw) were 0.660, 0.685 and 0.688 kg, respectively. The data regarding daily dry matter intake (DMI) through roughages and concentrate was found non-significantly. Higher daily dry matter intake (0.688) was noticed in treatment (T3) followed by T2 and T1. The corresponding figure of dry matter intake 100 kg⁻¹ body weight of the treatment groups T1, T2 and T3 were 4.75, 4.93 and 4.94 kg, respectively. The variation among different treatments was found statistically significant. The dry matter intake 100 kg⁻¹ body weight was noticed more in T3 (4.94) followed by T2 and T1. It indicates the influence of incorporation of Azolla and concentrate mixture improved

the dry matter intake of the experimental goat kids. The lowest dry matter intake kg day⁻¹ observed under T1 treatment due to non-consideration of dry matter intake through grazing.

More or less similar results were reported by Madavi *et al.* (2019), who reported that the average daily dry matter intake 100 kg⁻¹ body weight in T1, T2 and T3 treatment groups were 3.93, 4.08 and 4.03 kg, respectively. The corresponding figure of day⁻¹ dry matter intake of the treatment groups T1, T2 and T3 were 0.57, 0.62 and 0.58 kg, respectively. The difference among different treatment groups were statistically significant. The DM intake reported by these workers are nearer to the results of present investigation.

Cost of feeding

It is observed from Table 3 that the cost of feed goat kid⁻¹ for the experimental period of 63 days was Rs. 402.57, Rs. 325.08, and Rs. 249.48 goat kids fed with treatment groups under T1 (Natural grazing + recommended dose of concentrate mixture 200 g), T2 with (4 hrs grazing + concentrate mixture of 150 g + fresh azolla 100 g) and T3 (4 hrs grazing + concentrate mixture of 100 g + fresh azolla 200 g) and ad-lib gram straw was common in all treatments respectively. The cost of feeding day⁻¹ goat⁻¹ was lowest in treatment T3, as compared to T2 and T1 indicated that higher amount of Azolla (T3) used in goat feeding reduced the cost of feeding. Which can be beneficial to goat owners by getting higher monetary return by selling of animals of higher growth rate due to supplementation of Azolla.

Adake (2015) observed that cost of feeding day⁻¹ goat⁻¹ was lowest in T3 as compared to T2 and T1 indicated that the higher amount of Azolla used in goat kids feeding decreased the cost of feeding.

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