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Effect of azolla on growth performance of osmanabadi goat kids

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Abstract

The present investigation entitled. "Studies on supplementation of green Azolla (*Azolla pinnata*) on Growth Performance of Osmanabadi goat kids". Was conducted under Department of Animal Husbandry and Dairy Science, Post Graduate Institute, Dr. P.D.K.V., Akola for period of 60 day. Twenty goat kids between (3 to 6) months of age were divided into four groups on the basis of nearness to age and body weight. From the result it may be concluded that green Azolla (*Azolla Pinnata*) and concentrate supplemented diet as increased dry matter intake which is resulted into significantly more body weight gain and improving the health of the experimental goat kids.

Keywords: Azolla, concentrate, goat

Introduction

Goat (*Capra hircus*) justifies its designation as "the poor man's cow". The short generation interval of goat makes it possible to increase productive life more rapidly than cattle. Their small size and relatively low individual price bring them within the capacity of low income groups. Among the different livestock farming system, goat keeping can improve to be a truthful enterprise, as it requires less investment. Goats have a high survival rate under critical environmental conditions and can simultaneously produce a variety of products for the family and market like meat, milk, manure, skin and fiber.

Goat is a multi-functional animal and plays a significant role in the economy and nutrition of landless, small and marginal farmers in the country. Goat rearing is an enterprise which has been practiced by a large section of population in rural areas. Goats can efficiently survive on available shrubs and trees in adverse harsh environment in low fertility lands where no other crop can be grown. In pastoral and agricultural subsistence societies in India, goats are kept as a source of additional income and as an insurance against disaster.

Osmanabadi goat is mainly distributed at Latur, Tuljapur and Udgir talukas of Osmanabad districts of Maharashtra. Osmanabadi breed is reared mainly for meat and milk purpose. The goat is browsing animal and its feed consists of young leaves of trees and bushes. Farmers usually practice grazing in these animals without supplementing concentrates.

Materials and Methods

The present investigation entitled "Studies on supplementation of green Azolla (*Azolla pinnata*) on growth performance of Osmanabadi Goat kids". Was conducted at Livestock Instructional Farm, Department of Animal Husbandry & Dairy Science Dr. P.D.K.V. Akola, for a total period of 08 weeks (from 1 October 2016 to 30 November 2016 including pre-experimental period). Twenty osmanabadi goat kids between the age group of 03 to 06 months and weighing between 08 to 12 Kg were divided into four equal groups of five goat kids.

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Table 1: Details of Experimental goat kids.

Group	Tag No	Body weight at start to experiment (kg)	Average body weight (kg)
I	0-8	12	10.40
	0-6	8.5	
	0-222	10	
	0-5	10.5	
	0-35	11	
II	0-224	9.3	10.50
	0-30	10.5	
	0-225	10	
	0-31	12	
	0-27	10.7	
III	0-223	12	10.60
	0-26	8	
	0-216	10	
	0-34	12	
	0-211	11	
IV	0-212	8.5	10.45
	0-215	11	
	0-21	12	
	0-217	10.5	
	0-25	10.25	

Experiment was conducted by Randomized block design (RBD) with four treatments and four replications.

Table 2: Details of Allotment of treatment in feeding trials.

Treatment	Details
T ₁	Extensive feeding + Concentrates
T ₂	Extensive feeding + Concentrates +100gm green Azolla
T ₃	Extensive feeding + Concentrates + 200gm green Azolla
T ₄	Extensive feeding + Concentrates +300gm green Azolla

Note: Concentrate will be provided on the basis of body weight as per thumb rule

Experimental goat kids allotted for grazing from 9.30 am to 11.30 am for 2 hours in morning and 1.30 pm to 3.30 pm for 2 hours for total 4 hour grazing in T₂, T₃ and T₄ treatment respectively. Where as in treatment T₁ experimental goat kids allowed to full grazing up to 8 hours.

Table 3: Allotment of treatments

Treatment	Replication				
	R1	R2	R3	R4	R5
T1	0-8	0-6	0-222	0-5	0-35
T2	0-224	0-30	0-225	0-31	0-27
T3	0-223	0-26	0-216	0-34	0-211
T4	0-212	0-215	0-21	0-217	0-25

Fresh and clean water was provided to the experimental goat kids throughout the course of investigation. Animals were offered ad libitum drinking water through measuring bucket twice daily at 9.30 am and 3.30 pm. Daily water intake of each kid was recorded throughout the investigation period.

Table 4: Body weight gain of goat kids under different treatments (kg).

Treatments	Average Initial weight (kg)	Average Final Weight (kg)	Total gain in body Weight (kg)/kid	Weight gain kg/week/ goat kids (kg)	Weight gain kg/day/ goat kids (kg)
T ₁	10.40	14.24	3.84	0.480	0.068
T ₂	10.50	14.40	3.90	0.487	0.069
T ₃	10.60	15.48	4.88	0.610	0.087
T ₄	10.45	15.95	5.50	0.687	0.098
F test	N.S.	Sig.	Sig.	Sig.	Sig.
SE (M) ±	-	0.41	0.29	0.009	0.001
C.D at 5%	-	1.251	0.894	0.027	0.003

All the four groups of goat kids were kept under identical standard management practices. The kids were groomed twice daily at 9.30 am and 3.30 pm. the kids were kept free in open paddock for an hour.

All the animals were dewormed 15 days prior to start of the experiment. The health of goat kids was checked periodically. The goat kids were housed in barns.

Result and Discussion

The performance of goat kids by feeding green Azolla partially replaced for concentrate mixture, feeding was judged in terms of body weight and body measurement. The data obtained in this respect are discussed in the following paragraph.

1. Body weight

The total, daily and weekly body weight gain of goat kids is shown and tabulated and presented in following Table.

The values observed for total gain in body weight per kid were 3.84, 3.90, 4.88 and 5.50 kg in treatments T₁, T₂, T₃ and T₄ respectively. Also weekly gains in body weight per kid were 0.480, 0.487, 0.610 and 0.687 kg in treatment T₁, T₂, T₃ and T₄ respectively. The corresponding values for average daily gain were 0.068, 0.069, 0.087, and 0.098 kg in treatment T₁, T₂, T₃ and T₄ respectively. The variation among different treatments was found to be statistically significant ($p < 0.05$). The body weight gain was significantly ($p < 0.05$) higher in goat kids of treatment group T₄, followed by T₃, T₂ and T₁. Higher total gain was noticed in T₄. Indicated that supplementation of green Azolla increased the growth rate of experimental goat kids.

These observations are in agreement with findings of Dolberg *et al.* (1981) [5] reported 140 to 330gm daily gain in body weight per day in heifers was due to incorporation of Azolla meal in the ration. Dhage *et al.* (2007) [4] reported 43.6gm daily gains in body weight of kids which agrees with present investigation. Indira *et al.* (2007) [7] reported 294gm per day in buffalo calves by feeding Azolla meal. Similarly, Shital *et*

1. Chest

Table 5: Body chest girth gain of goat kids under different treatment (cm).

Treatments	Initial Chest girth (cm)	Final chest girth	Total gain in chest girth	Average chest girth per/day (cm)
T ₁	50.15	55.22	4.67	0.077
T ₂	50.62	56.67	5.70	0.095
T ₃	50.10	56.77	5.86	0.097
T ₄	51.31	58.31	6.81	0.113
F test	---	Sig.	Sig.	---
S.E.(m)±	---	0.36	0.17	---
C.D. 5% level	---	1.111	0.511	---

The initial chest girth vary with wider degree between treatments being 50.15, 50.62, 50.10 and 51.31 cm under T₁, T₂, T₃ and T₄ groups respectively, which reached of a level to 55.22, 56.67, 56.77 and 58.31 at the end of the trial. As a result, the total gain in chest girth of the kids over the experimental period worked out to 4.67, 5.70, 5.86 and 6.81 cm under T₁, T₂, T₃ and T₄ groups respectively. This means maximum gain.

In chest girth of the kids was obtained as a resulting of feeding of kids in T₄ treatments. The overall total gain in chest girth over the experimental period was significantly higher in

2. Body lengths

Table 6: Body length gain of goat kids under different treatments (cm).

Treatments	Initial length (cm)	Final length	Total gain in body length	Ave. body length per/day (cm)
T ₁	49.92	54.92	5.27	0.087
T ₂	49.76	55.39	5.63	0.093
T ₃	49.44	55.64	6.20	0.103
T ₄	50.08	56.28	6.20	0.103
F test	---	Sig.	Sig.	---
S.E.(m)±	---	0.25	0.18	---
C.D. 5% level	---	0.783	0.564	---

The total gain in body length was 5.27, 5.63, 6.20 and 6.20 cm in T₁, T₂, T₃ and T₄ respectively. Daily gain in length was 0.087, 0.093, 0.103 and 0.103 cm in T₁, T₂, T₃ and T₄ respectively. This revealed that the gain in length was significantly highest in T₄ and lowest in T₁ (control) treatment.

Shital *et al.* (2012) [9] also observed an average daily gain in

al. (2012) [9] also reported that there was an average total gain of 6.70 kg in Osmanabadi goat kids fed with 15 per cent level of Azolla meal. Hazhabr *et al.* (2014) [6] reported daily weight gain in broiler chick's incorporation of Azolla meal in ration. Ahmed *et al.* (2015) it was concluded that azolla can be added in the diet of growing sheep at 6% level replacing linseed cake without any adverse effect on the performance of the animals.

Nidhi Rawat *et al.* (2015) [8] Result showed significant improvement in cumulative feed intake, body weight and FCR in broiler group fed with Azolla. The use of Azolla in cattle and broiler ration improved their production performance; so has a great potential as sustainable efficient feed supplement for cow and broiler (upto 5%).

2. Body measurement

The result obtained in terms of the chest girth, body length and body height were analyzed and tabulated in following Tables.

T₄ groups (6.81 cm) over T₁, T₂ and T₃ groups. Daily gain in girth observed in T₁, T₂, T₃ and T₄ was 0.077, 0.095, 0.097 and 0.113 cm respectively.

Shital *et al.* (2012) [9] also observed an average daily gain in growth performance parameter (Body weight, height, length and chest girth) when Osmanabadi goat kids fed with Azolla. Uparikar *et al.* (2012) [10] who noticed the mean gain in body measurement (Chest girth, Body length, Body height) 1.93, 1.83 and 2.36 cm was significant when goat kids fed with Gliricidia protein tree leaves.

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3. Body heights

Table 7: Body height gain of goat kids under different treatments (cm).

Treatments	Initial height (cm)	Final height	Total gain in body height	Average body ht per/day (cm)
T ₁	50.15	54.82	4.67	0.077
T ₂	50.62	55.80	5.18	0.086
T ₃	50.10	55.56	5.46	0.091
T ₄	51.64	58.27	6.63	0.110
F test	---	Sig.	Sig.	---
S.E.(m)±	---	0.41	0.17	---
C.D. 5% level	---	1.257	0.538	---

The total gain in body height at wither point was found to be 4.67, 5.18, 5.46 and 6.63 cm for the treatments T₁, T₂, T₃ and T₄ respectively. The average daily gain in length observed was 0.077, 0.086, 0.091 and 0.110 cm for the treatments T₁, T₂, T₃ and T₄ respectively.

It was noticed that body measurement such as length, height and chest girth showed increasing trends over an experimental period in all the treatments but variation among different treatment groups was found to be statistically significant.

The results on body measurement are in agreement with the findings reported by Murugan *et al.* (1985) who observed an average daily gain in growth performance parameters (Body weight, Height, Length and Chest girth) when bucks fed with *Gliricidia* leaves. Further the non-significant difference in linear body measurement was also reported by Adangale *et al.* (2009) ^[1] in growth performance of weaned Osmanabadi kids.

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