

GROWTH AND FEED UTILIZATION IN BLACK BENGAL GOATS ON ROAD SIDE GRASS BASED DIET SUPPLEMENT WITH FISH MEAL AND UREA MOLASSES BLOCK

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Summary

Seventy two Black Bengal goats on road side grass based diet were fed on 0, 20, 40, 80, 100 or 120 g of fish meal (FM)/goat/day with or without *ad libitum* access to urea molasses block (UMB). The purpose was to assess the interaction of undegradable protein (UDP) and fermentable nitrogen (N) supplementation on feed intake, nutrient digestibility and growth of goats. Live weight gain of goats increased linearly with the increasing of dietary fish meal as an undegradable protein source. With the increasing level of fish meal the live weight gain (g/day) was 17, 23, 46, 48, 48 and 52 with urea molasses block and 12, 21, 31, 49, 47 and 47 without urea molasses block. It was concluded that the beneficial effects of urea molasses feeding to accelerate the dry matter intake, TDN intake and nutrient digestibility observed could not be exploited in terms of live weight gain.

(Key Words : Goats, Fish Meal, Molasses, Supplementation)

Introduction

Goats in Bangladesh are generally reared as scavenger and organized stall feeding is practically nil. Traditional rearing compels them to search out their feeds for subsistence. Deficient nutrition often depresses their actual meat and milk production potentialities. In Bangladesh more than 80% of goats are slaughtered before reaching their slaughter age, because of the poverty of the owner. The existing low productivity may be due to the nutritional, managerial and health constraints. Akhter (1989) suggested that through exploitation of genetic potentiality and proper feeding and also allowing them to attain a suitable age for slaughter the production of goat meat can almost be made double.

Goats reared under scavenging have no access to UDP. The apparent energy deficiency is the result of fermentable N deficiency in the rumen which decreases the rate of fermentative digestion and the ratio of protein to energy in the products of rumen fermentation. The

effect of low rumen fermentation activities reduces feed intake, low digestibility and poor growth rate (Saadullah et al., 1985). Correcting a nitrogen deficiency for the rumen microbes may increase the feed intake, digestibility and the ratio of protein to energy in absorbed products (Tiwari et al., 1990). In scavenging whether dietary CP or ME deficiency is responsible for poorer growth is not known.

With those ideas in view, the present study was aimed to find the interaction of UMB supplementation to conventional diets on feed intake, feed digestibility and growth in Black Bengal goat.

Materials and Methods

The study was undertaken in the sheep and goat farm in the Department of General Animal Science, Bangladesh Agricultural University, Mymensingh. A total of 72 castrated male goats age approximately 9-10 months having uniform body weight ranging from 10.0 to 11.0 kg were purchased from local markets of Mymensingh district.

The experimental goats in 2 equal halves were fed on 6 levels of FM with or without UMB (table 1). The UMB contained 56% molasses, 27% wheat bran, 8% urea, 8% CaO and 1% mineral mixture. The size and weight of the block licks were 22 × 10 × 7 cm and of 2 kg respectively.

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TABLE 1. EXPERIMENTAL DESIGN AND LEVEL OF DIETARY FISH MEAL

Parameters	Conventional feeding		Improved feeding with dietary fish meal (g/kg)			
	0	20	40	80	100	120
Feeding plan A						
No. of goats	6	6	6	6	6	6
Initial live weight (kg)	9.9 ± 0.5	10.2 ± 1.7	10.0 ± 0.9	10.1 ± 1.3	10.4 ± 1.1	10.3 ± 0.6
Urea molasses block	Nil	Nil	Nil	Nil	Nil	Nil
Feeding plan B						
No. of goats	6	6	6	6	6	6
Initial live weight (kg)	10.1 ± 1.7	10.3 ± 1.1	10.2 ± 1.3	9.9 ± 0.7	10.1 ± 1.2	11.2 ± 0.7
Urea molasses block	<i>ad lib</i>	<i>ad lib</i>	<i>ad lib</i>	<i>ad lib</i>	<i>ad lib</i>	<i>ad lib</i>

Experiment was carried out for 308 days with 9-10 months goat.
Basal diet: green grass (2 kg/goat.d), wheat bran (200 g/goat.d).
Common salt and mineral mixture was added to all groups.

The experimental animals was penned individually on bamboo made platform about 1.5 meters high from the concrete ground level in loose housing system. During digestion trials the goats were penned in an individual metabolic crate to facilitate individual feeding and collection of faeces and urine.

Two kg of green grass and 20 g of wheat bran in the morning and evening per goat formed the basal diet of each experimental goats. The goats on diet with or without UMB were fed on either of 0, 20, 40, 80, 100 and 120 g FM/day (table 1).

Fish meal was used in limited amounts while the goats had *ad libitum* access to UMB. Fresh drinking water was provided to these experimental goats both morning and evening.

Digestibility trials of goats feeding on different diets were performed at the end of the experiment covering a period of seven (7) days collection. The total faeces and urine voided by the each goats in 24 hours were collected from the floor every day between 7-8 A.M. All possible precautions were taken to avoid mixing of faeces with urine. A 10% sub-sample of faeces from each goat was weighed every day and representative sample was further processed for laboratory analysis.

Simultaneously individual daily feed intake of goats and their live weight were recorded. The weekly dry matter intake (DMI) of goat of different dietary groups supplemented with different level of fish meal with or without UMB were calculated.

The statistical analysis was done in a CRD and Duncan's New Multiple Range Test was used for mean comparisons of treatment as per instruction by Gomez and

Gomez (1984). The DMI, nutrient digestibility and growth of goats on diet with or without UMB were also regressed on dietary fish meal to have the effect of FM on those parameters.

Results and Discussion

In the results of the present study indicated that supplementation of goats diet with FM was beneficial to feed utilization and growth. The addition, tended to increase the beneficial effect of dietary FM in terms of DMI, TDN intake and when UMB was added digestibility of some nutrients increased (table 2 and 3). However, the beneficial effect of UMB supplementation could not be exploited in terms of live weight gain. The findings of this study agree with Schiere et al. (1987) and Preston and Leng (1987), but contradict the findings of many authors (Sudana and Leng, 1986; Coombe and Mulholland, 1983; Mirza et al., 1988; Beams, 1963; Leng, 1984; Fouly and Leng, 1986; Kunju, 1986; Soetanto et al., 1987ab; Tiwairi et al., 1988). The results of the current study signify that the deficiency of dietary UDP may be the main limitation to feed intake and growth of goats than the deficiency of dietary fermentable total N.

The effects of supplementing fish meal (FM) with or without urea molasses block (UMB) on growth, feed intake and nutrient digestibility in goats are presented in table 2 and 3. The dry matter intake (DMI) g/kg W^{0.75}, TDN intake (d/day) and DMI in % of live weight were increased with increasing level of dietary FM. However, the rate of increase in DMI and TDN intake for each g increase of dietary FM was higher in groups fed UMB

TABLE 2. DRY MATTER INTAKE AND APPARENT DIGESTIBILITIES OF RATIONS FED TO GOATS WITH INCREASING LEVELS OF FISH MEAL AS SUPPLEMENT WITH OR WITHOUT UREA MOLASSES BLOCK (UMB)

Parameters	Dietary fish meal (g/goat/day)							LSD
	UMB [†]	0	20	40	80	100	120	
Average live weight (kg)	-	11.4	13.6	14.6	17.8	17.5	17.2	1.92
	+	12.7	13.2	17.8	18.0	17.6	18.4	1.78
DM intake (g/d)	-	37.6	43.8	48.2	58.8	58.2	56.8	6.54
	+	40.6	48.2	69.3	71.4	70.3	73.3	10.46
DM intake (g/kgW ^{0.75} .d)	-	61	62	64	69	68	68	2.56
	+	61	66	79	81	82	82	6.88
TDN intake (g/d)	-	25.0	28.0	29.0	34.0	33.0	31.0	2.50
	+	27.0	30.0	42.0	41.0	41.0	41.0	4.96
DM intake (% of live weight)	-	3.3	3.2	3.3	3.3	3.3	3.3	0.03
	+	3.2	2.1	3.9	3.9	4.0	4.0	0.56
Live weight gain (g/d)	-	12	21	31	49	47	47	2.36
	+	17	23	46	48	48	52	4.60
Digestibility (%)								
DM	-	88.5	87.5	88.5	86.3	83.8	87.0	1.30
	+	86.3	87.5	87.3	84.5	88.8	89.3	1.30
CP	-	22.2	22.8	24.3	23.2	21.1	21.4	0.88
	+	22.8	25.8	24.2	22.2	25.6	21.2	1.40
CF	-	18.7	18.7	18.4	18.8	18.1	17.0	0.56
	+	18.0	17.7	18.1	18.2	18.2	19.1	0.36
EE	-	1.5	1.5	1.4	1.3	1.3	1.4	0.08
	+	1.5	1.5	1.4	1.4	1.5	1.3	0.06
NFE	-	28.8	33.5	37.5	34.7	34.1	35.9	2.20
	+	29.7	28.4	31.5	32.9	30.5	30.9	1.14

[†] + = with UMB.

- = without UMB.

TABLE 3. REGRESSIONS OF DRY MATTER INTAKE, LIVELWEIGHT AND DIGESTIBILITY OF NUTRIENT ON DIETARY FISH MEAL (g/goat day) FED WITH OR WITHOUT UREA MOLASSES BLOCK (UMB)

Parameters	a	b	r	Parameters	a	b	r	
Average live weight (kg)	-40.17	0.17**	0.93**	Digestibility (%)	DM	-88.44	-0.02**	-0.67**
	+46.71	0.25**	0.86**			+86.34	0.01NS	0.42NS
DM intake (g/day)	-12.30	0.05**	0.93**	CP	-23.23	-6.01NS	-0.49NS	
	+13.86	0.04**	0.85**		+24.40	-0.01NS	-0.32NS	
DM intake (g/kg W ^{0.75} .d)	-61.26	0.06**	0.93**	CF	-18.64	-0.00**	-0.54*	
	+64.77	0.17**	0.88**		+17.74	0.00**	0.78**	
TDN intake (g/day)	-26.46	0.05**	0.83**	EE	-1.78	-0.00**	-0.75**	
	+30.25	0.11**	0.79**		+1.49	-0.00	-0.62	
DM intake in % of live weight	-3.26	0.00NS	0.41NS	NFE	-31.97	0.03*	0.56*	
	+2.85	0.01**	0.69**		+29.66	0.01*	0.50*	

+ = with UMB.

- = without UMB.

* (p<0.05), ** (p<0.01)

than that in groups fed FM without UMB. The results may be an indication that a simultaneous increase in dietary CP and ME may be more beneficial in increasing DMI and TDN intake than increasing dietary CP alone.

Despite in variations in DMI and TDN intake, the increase of live weight for each g increase of dietary FM did not differ between two groups of goats fed FM with or without UMB, respectively. The interaction between fish meal and UMB was not studied because UMB was fed *ad lib*. There was a little higher live weight gain of goats with UMB than without UMB. The CF digestibility had no relation with dietary FM when fed without UMB. But, increasing dietary FM increased CF digestibility to a great extent in goats fed FM with UMB. Regardless of UMB, the increasing dietary FM increased NFE digestibility. The rate of increase in digestibility for unit increase in FM was lower for groups fed UMB than that in goats fed FM without UMB.

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