IOSR Journal of Agriculture and Veterinary Science (IOSR-JAVS)
e-ISSN: 2319-2380, p-ISSN: 2319-2372. Volume 9, Issue 5 Ver. I (May. 2016), PP 23-29
www.iosrjournals.org

Feeding Different Levels of Energy and Crude Protein in Compound Pellet and Performance of Black Bengal Goat

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Abstract: *Three different complete compound pellets containing different levels of energy and crude protein, viz. standard energy and protein (SEP),low energy and protein(LEP) and high energy and protein (HEP) were prepared where SEP contained 10.28 MJME and 140g CP per kg DM of feed, LEP contained 10% less energy and protein and HEP contained 10% high energy and protein than SEP, respectively and were fed to three groups of growing Black Bengal goats to evaluate feeding value of different levels of ME and CP containing pellet. Data were analyzed using the general linear model (GLM) procedure of statistical analysis software (SAS). The effects of different level of energy and protein containing pellet on performance of goat were different. Highest energy (ME)and crude protein intake and best FCR, PCR and total live weight gain were observed in HEP but SEP and HEP showed significantly higher ($p<0.01$) values of the parameters than LEP and only HEP showed significantly higher ($p<0.05$) crude protein intake ($Kgd^{-1}100^{-1}Kg$ LW and gKg^{-1} $W^{0.75}$ d^{-1}) and MEI ($MJd^{-1}100^{-1}Kg$ LW and MJ Kg^{-1} $W^{0.75}$ d^{-1}) than LEP. Both SEP and HEP groups showed significantly higher ($p<0.01$) digestibility of CP than LEP. On the other hand, HEP showed higher ($p<0.01$) digestibility of DM and OM than both SEP and LEP but digestibility of EE was higher ($p<0.01$) in SEP than LEP and HEP. Digestibility of NFE was dissimilar in three groups and the difference was significant ($p<0.01$) where highest value was found in HEP. Dissimilar percentage of digestible value of CP, NFE and D values were observed among the groups where HEP showed highest value ($p<0.01$) and LEP showed lowest. Percent of digestible value of CF was higher ($p<0.01$) in LEP than SEP and HEP. On the other hand SEP and LEP showed higher ($p<0.01$) value of EE than HEP where as SEP and HEP showed higher ($p<0.01$) value of TDN than LEP. Meat yield, selling price of meat, and total price was highest in HEP but both SEP and HEP showed significantly higher ($p<0.01$) value of these parameters than LEP. Feed cost and total rearing cost was highest in HEP but the values were dissimilar among the groups and the difference was significant ($p<0.01$). Insignificantly highest net profit was observed in SEP and lowest in LEP. From the observation it can be concluded that there is a positive effect of increasing energy and crude protein in diet on performance of goat but economically not significant and in this case standard energy and crude protein containing diet can be used for commercial goat production in stall feeding.*

Keywords: *Goat, Growth performance, Digestibility, Economic assessment*

I. Introduction

All over the world, there are different breeds of goats and each is adapted to particular environmental conditions and has different nutritional requirements. Information on dietary levels of energy and crude protein of tropical breeds of goat are scant, however, few attempts have been made to determine their nutrient requirements for growth and maintenance (Onwuka and Akinsoyinu, 1989) [1]. In Bangladesh, the traditional systems of feeding goats solely depends on the grasses that contain higher percentage of crude fibre (Ghosh and Maitra, 1983) [2]. Perhaps this practice is the major cause of low productivity from goats as the feeds they consume are inadequate both in quality and quantity to meet their nutritional requirements. There is limited information on the feed intake and nutrients utilization by Black Bengal goats under the traditional or organized system of production. Nutritional factors specially dietary energy and crude protein are the main determinants for growth and meat production in goats (Devendra, 1988) [3]. Estimation of optimal dietary energy and crude protein levels for efficient utilization of nutrients is essential to understand the nutritional requirements for growth. The aim of this work was to investigate the effects of feeding different levels of dietary energy and crude protein in compound pellet on performance of Black Bengal goat and determine the suitable one which is more profitable in stall feeding system of goat production.

II. Materials And Methods

2.1 Processing of feed ingredients

Napier grass (*Pennisetum purpureum*), cultivated in fodder field of Animal Nutrition Department of Bangladesh Agricultural University, was selected as basal feed and cut, chopped and sun dried. The chopped grass was placed in electric drier for uniform drying, ground in electric grinder using 1mm diameter sieve. Maize, wheat, wheat bran, rice polish, mustard oil cake, soybean meal and molasses were purchased from local market with proper attention so that they are free from dust, fungus and any other extraneous materials. The sample of grass and other feed ingredients were analyzed for proximate components before using for pellet preparation.

2.2 Preparation of compound pellet

Three types of compound pellet, viz. standard energy and protein (SEP) contained 10.28 MJME and 140g CP/kgDM of feed (treated as control), low energy and protein (LEP) contained 10% less energy and CP and high energy and protein (HEP) contained 10% higher energy and CP than SEP, respectively, were prepared and properly stored for the goats belonging to three different groups with ground Napier grass and concentrate mixture at the ratio of 60:40 (Table 2.1).

Table 2.1 Ingredients (%) and proximate components (% DM basis) of experimental diets

Dietary composition			
Ingredients	**Dietary groups**		
(kg/100 kg DM)	**SEP**	**LEP**	**HEP**
Napier grass (dry, ground)	60.0	60.0	60.0
Wheat bran	7.0	5.0	0.5
Rice polish	9.0	24.0	0.5
Mustard oilcake	7.0	7.0	1.0
Soybean meal	5.0	2.5	12.0
Maize	8.0	0.5	13.0
Wheat	3.0	0.5	12.0
Molasses	1.0	0.5	1.0
Proximate components (g/100 g DM)			
Crude Protein	14.03	12.65	15.39
Ether Extract	3.35	4.19	2.07
Crude Fibre	20.90	24.91	18.67
Total ash	9.70	12.82	9.62
Nitrogen Free Extract	51.62	45.23	54.25
MEMJ/kg DM	10.26	9.28	11.32

Dicalcium phosphate (DCP) and common salt was added @ 1% of concentrate. SEP = standard energy and protein, LEP = low energy and protein (containing 10% less energy and protein than SEP) and HEP = high energy and protein (containing 10% high energy and protein than SEP). MEMJ = Mega Jules Metabolizable Energy, DM = Dry matter

2.3 Selection, housing and feeding of goats

Fifteen castrated Black Bengal goats of about six months of age and average body weight 9.64 to 9.86 kg were collected from local farm. The goats were randomly divided into three equal groups, tagged and housed in a well ventilated pen and allowed two weeks to adapt with the housing condition and experimental diets. The goats were vaccinated against Peste des petits ruminants (PPR) after allowing seven days of quarantined, and anthelmintic drug was administered to control gastrointestinal parasites. Fifty percent of the daily allocated compound pellet was supplied to the respective group at every 8:00 am and the animals were allowed for grazing from 9:30 to 11:30 am and then were confined in pen. Rest of the pellet was supplied at 4:00 pm. Grazing length was shortened gradually and fully stopped after seven days, and pellet was supplied @ 5kg DM/100kgLW**.** Goats were reared for 100 days with identical care and management and thereafter slaughtered to know the dressing percentage.

2.4 Measurements of feed intake and live weight gain

In every morning leftover, if any, were collected, weighed and daily feed intake was calculated. Initial live weight of each goat was taken at the beginning of the experiment for three consecutive days before offering feed at morning and the mean weight of individual goat was recorded as initial weight. Thereafter, goats were weighed individually at 6:30 am prior morning feeding in every 7 days interval throughout the experimental

period. Final live weight of each goat was also taken for three consecutive days at the end of the experiment of 100 days.

2.5 Metabolic trial

At 84th day of experiment a conventional metabolic trial was performed for a period of 10 days to know the digestibility of feed nutrients and retention of nitrogen. Amount of daily feed intake, voided feces and excretion of urine were recorded. At the beginning of metabolic trial the sample of compound pellet from each group was taken for proximate analysis. Leftover from each group, if any, was collected, measured and sampled for proximate analysis. Urine was collected in a bucket containing 6 N H_2SO_4 and total voided amount was measured every morning. Sample from urine and feces were taken and preserved at 4^0c for determination of total nitrogen.

2.6 Proximate analysis

Samples of feed, leftover and feces were analyzed for nutrient content following the methods of AOAC (2012) [4]. Nutritional analyses were done for dry matter (DM), crude protein (CP), crude fibre (CF), ether extract (EE), total ash (TA) and nitrogen free extract (NFE). Digestible crude protein (DCP) was calculated according to the methods of McDonald *et al*. (1988) [5]. Acid detergent fibre (ADF) and neutral detergent fibre (NDF) content of samples were determined by Fibertec™ system (VELP Scientifica, EU) following the procedure of Van Soest (1991) [6]. Energy value of whole diet was estimated from digestible organic matter (DOM) as ME (MJ/kgDM) = 0.16 × D value (MAFF, 1984) [7]. D value or the concentration of digestible organic matter in dry matter (DOMD) of the diets was calculated by the gm of digested OM in each kg DM of diet multiplied by 1000.

2.7 Slaughtering and carcass weight

To know the carcass yield goats were slaughtered following Halal method and then allowed for proper bleeding. Warm carcass weight was recorded immediately after complete dressing and evisceration. The dressing percentage was calculated as the carcass weight divided by the slaughter weight then multiplied by 100 according to Devendra (1988) [3].

2.8 Statistical analysis

Data were analyzed by completely randomized design using the GLM procedure of SAS version 9.1 (SAS Institute Inc., Cary, N.C.) to determine the effects of feeding different levels of energy and crude protein containing ration on performance of Black Bengal goat.

III. Results

3.1 Growth performance

As is shown in table 3.1, significantly highest (*p<0.01)* body weight was attained by HEP and lowest by LEP (Figure 1). Average daily live weight gain in both HEP and SEP was higher *(p<0.01)* than LEP (Table 3.1). Dry matter intake of three groups was insignificantly different. Total crude protein intake of HEP (7.07kg) was significantly higher *(p< 0.01)* than LEP (5.28kg) and almost similar to SEP (6.49kg). Significantly highest (*p < 0.05*) daily CPI (100^{-1} kg live weight and kg^{-1} $W^{0.75)}$ was also observed in HEP and lowest in LEP.

Total ME intake by HEP (451.95MJ) was significantly higher (*p< 0.01*) than LEP (318.48MJ) and similar to SEP (403.01MJ). Daily ME intake 100^{-1}kg live weight and kg^{-1} $W^{0.75}$ was significantly highest (*p < 0.05*) in HEP and lowest in LEP but ME intake by SEP was statistically insignificant as compared to HEP and LEP. Best feed conversion ratio (FCR) and protein conversion ratio (PCR) was observed in HEP followed by SEP and lowest in LEP. Both SEP and HEP showed statistically insignificant FCR and PCR value but significantly better (*p < 0.01*) than that of LEP. ME intake kg^{-1} live weight gain in SEP and HEP was almost similar and both the groups showed significantly higher (*p <0.05*) performance than LEP. Intake of protein as a ratio of energy intake (CPI: MEI) by HEP was insignificantly higher than other two groups.

Table 3.1 Performance of goats fed different levels of energy and crude protein based compound pellet diets

Parameters	Dietary groups			LS
	SEP	LEP	HEP	
Performance of kids				
Initial live weight (kg)	9.86±0.521	9.73±0.241	9.64±0.384	NS
Final live weight (kg)	15.97^{a}±0.868	13.35^{b}±0.548	16.43^{a}±0.966	*
LW gain ($kg100^{-1}d$)	6.11^{a}±.395	3.62^{b}±0.388	6.78^{a}±0.618	**
LWG ($g\ d^{-1}$)	61.10^{a}±0.390	36.20^{b}±0.380	67.80^{a}±0.610	**
DM intake				
Total DM intake ($kg100^{-1}d$)	45.01±.527	41.10±1.405	45.98±2.312	NS
DMI ($kg100^{-1}kg\ LWd^{-1}$)	3.53±0.101	3.59±0.102	3.54±0.231	NS
DMI ($g^{-1}kgW^{.75}d^{-1}$)	111.63±3.223	113.72±3.228	111.95±7.319	NS
CP intake				
Total CP intake ($kg100^{-1}d$)	6.49^{a}±0.364	5.28^{b}±0.180	7.07^{a}±0.355	**
CPI ($kg100^{-1}kg\ LW\ d^{-1}$)		0.462^{b}±0.013	0.544^{a}±0.035	*
CPI ($g\ kg^{-1}W^{.75}\ d^{-1}$)	16.11^{ab}±0.464	14.61^{b}±0.413	17.23^{a}±1.126	*
ME intake				
ME ($MJ\ kg^{-1}$ DM)	8.94^{b}±0.289	7.72^{c}±.207	9.82^{a}±0.227	**
Total ME intake ($MJ100^{-1}d$)	403.01^{a} ±27.541	318.48^{b} ±17.601	451.95^{a} ±26.255	**
MEI ($MJ\ 100^{-1}Kg\ LWd^{-1}$)	31.63^{ab}±1.639	27.79^{b}±1.074	34.98^{a}±3.039	*
MEI ($MJ\ kg^{-1}W^{.75}\ d^{-1}$)	1.00^{ab}±.051	0.87^{b}±0.034	1.10^{a}±0.095	*
Nutrient efficiency for gain				
FCR(DMI/LWG)	7.41^{b}±0.295	11.8^{a}±1.196	6.90^{b}±0.359	**
PCR (CPI/LWG)	1.07^{b}±0.042	1.52^{a}±0.153	1.06^{b}±0.055	**
MEI/LWG (MJ/kg)	66.16^{b}±2.457	91.05^{a}±8.753	67.87^{b}±4.209	*
CPI/MEI (kg/MJ)	0.016±0.0020	0.016±0.0000	0.015±0.0024	NS

SEP = standard energy and protein, LEP = low energy and protein (10% lower than SEP), HEP = high energy and protein (10% more than SEP). NS = Non significant, ** $p<0.01$, * $p<0.05$, $^{a, b, ab, c}$ mean values having different superscripts in a row differ significantly. LS= Level of significance

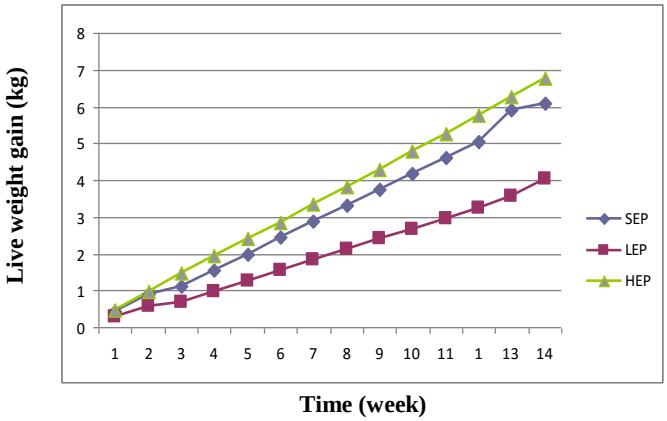

Figure 1 Cumulative live weight gain (kg)

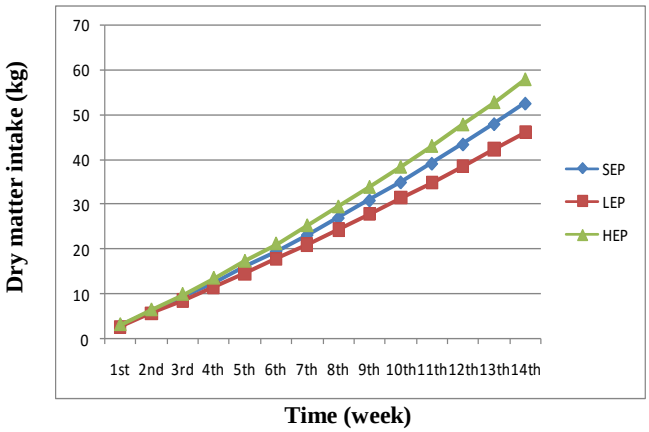

Figure 2 Cumulative dry matter intake from pellet (kg)

3.2 Feeding value of diets

3.2.1 Apparent digestible coefficient

Digestibility of dry matter and organic matter was highest in HEP followed by SEP and LEP where HEP showed significantly higher (*p<0.01*) value than other two groups (Table 3.2). Though digestibility of crude protein was highest in HEP (68.40) but statistically similar to SEP (66.73) and the value of both the groups was significantly higher (*p<0.01*) than LEP group (58.92). Crude fibre digestibility was highest in HEP and lowest in SEP but did not differ significantly among the groups. Goats of SEP (64.26) showed significantly higher (*p<0.01*) ether extract digestibility than LEP (47.91) and HEP (48.16). Digestibility of nitrogen free extract in three dietary groups was statistically dissimilar *(p<0.01)* and highest digestibility value was observed in HEP (70.23) and lowest in LEP (51.11). ADF and NDF digestibility was dissimilar where insignificantly higher value was observed in HEP group.

Table 3.2 Apparent digestibility of nutrients and nutritive value of experimental diets

Nutrients	Dietary groups			LS
	SEP	LEP	HEP	
Digestibility (%)				
Dry matter (DM)	58.72^{b}±2.162	53.36^{b}±1.555	65.71^{a}±1.681	**
Organic matter(OM)	61.91^{b}±1.994	55.39^{b}±1.486	67.94^{a}±1.570	**
Crude Protein (CP)	66.73^{a}±1.743	58.92^{b}±1.578	68.40^{a}±1.549	**
Crude Fibre (CF)	57.89±2.206	62.14±1.261	63.09±1.809	NS
Ether Extract (EE)	64.26^{a}±1.872	47.91^{b}±1.736	48.16^{b}±2.541	**
Nitrogen Free Extract (NFE)	62.03^{b}±1.990	51.11^{c}±1.629	70.23^{a}±1.458	**
Acid Detergent Fibre (ADF)	58.00±2.199	58.82±1.380	63.46±1.791	NS
Neutral Detergent Fibre (NDF)	58.11±2.195	57.98±1.399	63.68±1.774	NS
Nutritive value				
Crude Protein (CP)	9.63^{b}±0.251	7.57^{c}±0.202	10.52^{a}±0.238	**
Crude Fibre (CF)	12.10^{b}±.461	15.48^{a}±0.314	11.77^{b}±0.337	**
Ether Extract (EE)	2.15^{a}±0.062	2.00^{a}±0.072	0.99^{b}±0.052	**
Nitrogen Free Extract (NFE)	32.02^{b}±1.027	23.11^{c}±0.737	38.09^{a}±0.791	**
TDN	58.60^{a}±1.881	50.68^{b}±1.389	62.64^{a}±1.485	**
D value	55.90^{b}±1.801	48.29^{c}±1.295	61.40^{a}±1.419	**
N balance (g/d)				
N intake	13.36^{b}±0.249	11.50^{c}±0.381	16.89^{a}±0.353	**
Fecal N excretion	4.44^{b}±0.227	4.61^{ab}±0.201	5.33^{a}±0.348	*
Urinary N excretion	4.57±.753	2.82±0.511	4.54±0.843	NS
Nitrogen retention	4.35^{b}±0.998	4.07^{b}±0.376	7.02^{a}±0.815	*

SEP = standard energy and protein, LEP = low energy and protein (10% lower than SEP), HEP = high energy and Protein (10% more than SEP). NS = Non significant, ** *p<0.01*, $^{a, b, c}$ mean values having different superscripts in a row differ significantly. LS = Level of significance

3.2.2 Nutritive value

Percent of digestible crude protein varied among the dietary groups where highest *(p<0.01)* value was observed in HEP and lowest in LEP. On the other hand, higher (p<0.01) percent of digestible crude fibre was observed in LEP than other two groups (Table 3.2). Digestible ether extract was almost similar in SEP and LEP which was significantly higher (*p<0.01*) than that of HEP. There was significant variation (*p<0.01*) of digestible NFE among the treatment groups. The highest NFE value was found in HEP and lowest value in LEP. Significantly higher (*p<0.01*) TDN value was observed in both HEP and SEP compared to the value in LEP. The D value was highest in HEP and lowest in LEP and the difference of D value among the groups was highly significant (*p< 0.01*).

3.2.3 Nitrogen balance

Nitrogen intake (g/d) by goat of three treatment groups was different where HEP showed highest value and LEP showed lowest value. The difference of nitrogen intake among the groups was highly significant (*p<0.01*). Highest fecal nitrogen was observed in HEP (5.33) and lowest in SEP (4.44). The difference of fecal nitrogen between the groups HEP and SEP was significant (*p<0.05*). Nitrogen excreted (g/d) in urine was highest in SEP (4.57) and lowest in LEP (2.82) but the difference among the groups was not significant (*p>0.05*). Nitrogen retention (g/d) was significantly higher (*p< 0.05*) in HEP than other two groups.

3.3 Economic assessment

As is shown in table 3.3, live weight gain in HEP and SEP was significantly higher (*p<0.01*) than LEP. Insignificantly highest dressing percentage was found in HEP and lowest in LEP. Meat yield from the goats of

SEP (3.11kg) and HEP (3.50kg) was similar and significantly higher ($p < 0.01$) than that of LEP (2.01kg). Price of meat and total price of dressed carcasses in SEP and HEP was also significantly higher ($p<0.01$) than LEP. Average feed cost and total rearing cost of three treatment groups varied and the cost tended to increase in goats received pellet SEP and HEP than the goats received pellet LEP. The difference among the groups was highly significant ($p < 0.01$). Cost per kg weight gain and per kg meat production was statistically non significant among the groups. Profit obtained by goat was Tk. 769.39 for SEP, Tk. 695.89 for HEP and Tk. 522.86 for LEP. The difference of profit among the groups was not significant.

Table 3.3 Economics assessment of the experimental diets fed by Black Bengal goat

Attribute	Dietary groups			LS
	SEP	LEP	HEP	
Carcass traits				
Carcass weight (kg)	8.15	6.65	8.47	-
Weight gain (kg)	6.10^{a}±.395	3.62^{b}±0.388	6.78^{a}±0.618	**
Dressing %	51.05±0.403	49.87±0.981	51.56±0.502	NS
Meat yield (kg)	3.11^{a}±0.192	2.01^{b}±0.231	3.50^{a}±0.333	**
Economics of feeding				
Price of meat (@Tk.430/kg)	1339.02^{a}±82.57	868.37^{b}±99.530	1506.26^{a}±143.20	**
Price of skin, head, GIT	300	300	300	-
Total return (Tk.)	1639.02^{a}±82.57	1168.37^{b}±99.53	1806.26^{a}±143.20	**
Price of feed (Tk./kg)	11.23	8.22	13.94	-
Total feed cost (Tk.)	644.64^{b}±36.561	420.50^{c}±14.432	885.35^{a}±44.868	**
Labour cost (Tk.)	200	200	200	-
Other cost (Tk.)	25	25	25	-
Total rearing cost (Tk.)	869.64^{b}±36.561	645.50^{c}±14.432	1110.35^{a}±44.868	**
Cost /kg weight gain (Tk.)	143.72±6.137	167.12±16.522	167.40±10.339	NS
Cost /kg meat yield (Tk.)	281.51±11.628	338.01±40.466	325.31±22.724	NS
Net profit (Tk.)	**769.39±61.197**	**522.86±87.284**	**695.89±100.968**	**NS**

SEP= standard energy and protein, LEP= low energy and protein (10% lower than SEP), HEP= high energy and protein (10% more than SEP). NS= Non significant, ** $p<0.01$, $^{a, b, c}$ mean values having different superscripts in a row differ significantly LS= Level of significance

IV. Discussion

Dry matter intake per 100 kg live weight or per kg metabolic body size was slightly higher in LEP than HEP and SEP. It seem that the excess amount of DM was required by goats of LEP to meet up their demand of nutrients specially energy and protein. This finding agreed with Eroarome *et al*. (2006) [8] who noted that voluntary DMI decreased with increase in the levels of energy but not with levels of protein. Increased level of energy and protein in pellet improved palatability and digestibility of DM and hence body weight increased accordingly. So total DM intake was higher in high energy and protein containing pellet group due to higher body weight of the group. Haddad (2005) [9] observed that the addition of energy and protein in pellets improves total digestibility and DMI with goats fed tropical forages. Tameem Eldar *et al*. (2012) [10] found that the level of energy/protein did not significantly ($p>0.05$) affect on average daily feed intake which is well agreed with present study. Daily crude protein and ME intake per 100 kg body weight and per kg metabolic body size was significantly increased in higher energy and protein containing group. It might be due to similar amount of DMI per 100kg body weight and the variation of energy and protein in pellet. As energy and protein are the main nutrients for growth of animals so weight gain of goats of SEP and HEP was significantly increased with the increase of energy and protein level in diet. This statement is in agreement with the findings of Limea *et al.* (2009) [11]. Many researchers (Hango *et al*., 2007 [12]; Morand-Fehr, 2005; [13] Ntakwendela *et al*., 2005 [14] and Ayo, 2002 [15]) reported that growth rate of goats increased with increasing level of energy and protein. Significantly better FCR, PCR and MEI/LWG in high energy and protein containing group indicated the improved effect of energy and protein on growth of goat of the groups SEP and HEP. Similar result was observed by Almeida *et al*. (2006) [16] and Mahgoub *et al.* (2005) [17] for Creole kids, Ryan *et al.* (2007) [18] for Crossbred Boer and Mahgoub *et al.* (2005) [17] for Omani Batina goats, Tameem Eldar *et al.* (2012) [10] for Sudan goats.

Digestibility of dry matter, organic matter and crude protein was increased and higher in HEP. High energy and protein in diet favour rumen microbial activity resulting improved digestion of the nutrients. Higher percent of NFE and crude protein in HEP resulted lower digestion of ether extract because rumen microbes have got their required energy easily from available soluble carbohydrate (NFE). Similar result was observed by Reddy and Raghavan (1987) [19] and Haddad (2005) [9]. They reported that digestibility of nutrients was increased with the increase of energy and protein in diet. Percent of digestible CP and NFE were highest in HEP

followed by SEP due to presence of higher percentage of CP and NFE in diet and its better utilization by the goats. Higher percent of digestible CF in LEP indicated rumen microbes had to utilize more CF to meet up the demand of energy in LEP. As TDN and D value depend on digestible nutrients, so higher digestibility of CP and available energy in diet resulted higher TDN and D value of high energy and protein containing dietary groups. Dressing percentage was increased with the increase of weight at slaughter. This finding was agreed with the comment of Limea *et al.* (2009) [11]. They stated that the higher dressing percentage for the goats of high energy and protein dietary groups was probably due to better body development as well as proportionately similar digestive tract. Hango *et al*. (2007) [12] observed that carcass weight and dressing percentage increased with increasing amount of energy and protein in diet. These findings are in well agreed with the present result. Higher price per kg feed resulted significantly higher ($p< 0.01$) feed cost and total rearing cost in higher energy and protein containing dietary groups. Cost per kg weight gain and meat yield was higher in LEP due to lower weight gain of goats belonging to LEP. Net profit in SEP was insignificantly higher than LEP and HEP. Higher price of per kg pellet in HEP and significantly lower weight gain in LEP resulted lower profit of the groups.

V. Conclusion

Inclusion of high energy and protein in compound pellet diet improved growth performance of goat significantly but economic assessment was not significant. On the basis of economic point as profit was insignificantly highest in standard energy and protein containing dietary group. So standard compound pellet diet can be used for commercial goat production in stall feeding.

Acknowledgements

The authors are very grateful to University Grants Commission (UGC) of Bangladesh for financial support to carry out this research work and also grateful to Professor Dr. M.A.M.Y. Khandokar, Principal Investigator of "Conservation of Black Bengal goat as the potential genetic resource in Bangladesh" project, Department of Animal Breeding and Genetics, Bangladesh Agricultural University for financial support from USDA fund.

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