EFFECT OF FEEDING BYPASS PROTEIN ON NUTRIENT UTILIZATION OF BARBARI KIDS

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Received 29-5-2014 Accepted 26-6-2014

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ABSTRACT

The objective of this study was to evaluate the effect of protected ground nut cake (GNC) on intake of nutrient and their utilization in growing goats. Fourteen goat kids (8.22 kg body weight and 3 month of age) were randomly divided into 2 groups of 07 kids each. In control group kids were given untreated GNC, while in treatment group they were fed concentrate mixed with formaldehyde treated GNC. Each kid was stall fed on concentrate and roughage, in the ratio of 50:50. Feeding trial was conducted for 90 days. Results of study indicated that the digestible crude protein intake (g per day, % body weight and per kg W 0.75) and total digestible nutrient intake (kg per day, % body weight and per kg W 0.75) in kids fed on bypass protein based ration were significantly ($p<0.05$) higher as compared to kids those were not fed bypass protein based ration. Similarly, % digestibility coefficient of DM, CP, EE, CF and NFE were significantly ($p<0.05$) higher in protected protein group as compared to the control group. Therefore, the nutritive values (TDN% and DCP %) significantly improved in diets based on protected protein.Study concluded that intake as well as digestibility of nutrients was higher in kids fed on 1.2% formaldehyde treated groundnut cake in comparison to kids fed on untreated groundnut cake based ration.

KEY WORDS: Formaldehyde treated GNC, nutrient utilization, barbari kids.

INTRODUCTION

Inadequate feed supply is the major constraint in rearing the small ruminants. Fast growing goats have protein requirements that exceed the amount provided by ruminal microorganisms (ARC, 1998). Groundnut cake is one of the cheaper and most commonly used protein supplements for livestock in India. However, high rumen degradability of ground nut cake reduces its nutritive value. Formaldehyde treatment of cake is commonly used and cheaper method for protection of protein from microbial degradation and supplying better amino acid profile at post ruminal tract. Significant positive effect of protected GNC feeding was reported by Singh *et al.* (2014). Therefore, the present study was planned to evaluate the effect of protected ground nut cake (GNC) on nutrient intake as well their utilization in growing goats.

MATERIALS AND METHODS

Fourteen healthy male goat kids were randomly divided into two groups of 07 kids each and maintained on respective isonitrogenous and isocaloric rations.In treatment T1 group (control) kids were fed untreated GNC, while treatment T2 group were fed formaldehyde treated GNC (1.2 g of formaldehyde per 100 g crude protein) in concentrate mixtures. Each kid in all the groups were stall fed on concentrate and roughage, in the ratio of 50:50. Feeding trial was conducted for 90 days.Nutrient utilization study was done after conducting digestion trial. A digestion trial on kids was conducted for 7 days collection period at end of experiment. During this period daily records of feed offered (both roughage and concentrate mixture), feed refusal and faeces voided were maintained. The total faeces voided were recorded and 1/10th faecal sample was drawn and placed into pre-weighed clean dried aluminium faecal tray and kept in an oven at 90^0C overnight for drying. The dried sample along with tray was reweighed so as to ascertain the dry matter percentage of

the faeces. The faeces samples of each day were collected and pooled in clean, dried, polythene bag duly numbered for further chemical analysis.Feeds and refusals were processed similarly prior to chemical analysis. Feed, fodder, feed residue and faecal samples were analysed for proximate principles by the standard methods (AOAC, 1995). The data was analysed using student unpaired and paired t-test as per Snedecor and Cochran (1995).

RESULTS AND DISCUSSION

In the present study (Table 1) the kids fed on bypass protein based ration showed significantly ($p<0.05$) higher DMI,CPI ,DCPI and TDNI as compared to kids that were not fed bypass protein based ration.

Table1. Mean daily feed and nutrients intake during digestion trial period

	Particulars	T_1	T_2	t-value
Per head	Mean body weight (Kg)	11.79±0.24	12.69±0.17	3.03*
	DMI (g)	376.87±8.47	407.26±7.03	2.98*
	CPI (g)	67.84±1.52	73.31±1.26	2.98*
	DCPI (g)	45.77±1.45	54.09±1.10	3.94*
	TDNI (g)	249.91±7.85	291.88±5.43	3.75*
	Ca (g)	11.37±0.39	12.32±0.68	1.31
	P (g)	3.30±0.21	3.57±0.20	1.02
Per 100 Kg Body Weight	DMI (kg)	3.20±0.02	3.21±0.02	0.40
	CPI (g)	575.49±3.74	577.57±4.29	0.40
	DCPI (g)	388.08±7.63	426.22±6.49	3.11*
	TDNI (Kg)	2.12±0.03	2.30±0.03	3.19*
	Ca (g)	96.73±3.93	96.87±4.71	0.02
	P (g)	27.94±1.53	28.27±1.85	0.15
Per Kg Metabolic body size	DMI (g)	59.25±0.53	60.56±0.54	1.89
	CPI (g)	10.66±0.10	10.90±0.10	1.89
	DCPI (g)	7.19±0.15	8.04±0.12	3.65*
	TDNI (g)	39.25±0.74	43.41±0.61	3.66*
	Ca (g)	1.79±0.07	1.83±0.09	0.37
	P (g)	0.52±0.03	0.53±0.03	0.37

** Significant ($p<0.05$)*

Crude protein intake (% body weight and per kg W0.75) of kids during experimental period was not influenced by protected and non-protected protein in the ration , but DCPI and TDNI were

significantly (p<0.05) higher in T2 . Whereas, calcium and phosphorus intake (g per day, % body weight and per kg W 0.75)of kids during different treatment group were non-significant. Present results are in agreement with the results of Singal (2001) and Haddad et al. (2001), who reported significantly higher CP intake per 100 kg body weight in protected protein fed groups as compared to control group. Ponnampalam *et al.* (2003) also reported increased energy and protein intake on inclusion of RUP in small ruminants.

Digestibility of different nutrients

In the present study dietary treatments were found to have significant influence on the digestibility of various nutrients (Table 2).

Table2. Digestibility coefficients of organic nutrients (%dry matter basis)

Organic Nutrients	T_1	T_2	t-value
DM	64.85±1.09	68.70±1.12	2.66*
CP	67.42±1.06	73.78±0.77	3.23*
EE	69.17±0.94	72.64±0.78	2.81*
CF	57.18±0.93	61.25±1.16	2.95*
NFE	70.98±1.12	76.09±1.05	3.05*

* *Significant (p<0.05)*

Table 3. Nutritive value of experimental diets fed on bypass protein based ration

Particulars	T_1	T_2
DCP%	12.13	13.28
TDN%	66.24	71.67

Significantly (p<0.05) higher digestibility coefficient for dry matter (DM), crude protein (CP), ether extract (EE), crude fiber (CF) and nitrogen free extract (NFE) was observed in bypass protein fed group as compared to the control group. Results were supported by the findings of Gurunge *et al.* (2009) in crossbred calves. Similarly, Fahmy *et al.* (1992), Paengkoum *et al*. (2004) and Abdollahzadeh *et al.* (2012) also observed significant improvement in the digestibility of DM, CP, EE and organic matter on account of feeding bypass protein based ration. Abdel-Ghani *et al.* (2011) reported that different protected protein methods can led to significantly improved (p<0.05) digestible coefficient values of different nutrients except crude fiber. In the present study the nutritive values (TDN% and DCP %) significantly improved as a result of using protected GNC in the feed. (Table 3). The improvement of TDN and DCP values may be due to enhanced digestibility coefficient of nutrients in response to the protected protein methods by heat and sodium hydroxide treatments.

Dosky *et al.* (2012) also concluded that heat and formaldehyde treatments significantly (P<0.05) improved digestibility of dry matter (DM), organic matter (OM), crude protein (CP) and ether extract (EE), decreased ruminal pH and ruminal NH_3 concentration in lambs.

Contrary to the findings, Ramachandran and Sampath (1995) did not find any significant differences in digestibility's of DM, OM, CP, NDF and ADF due to change in UDP level (35 or 55% of dietary

CP) in lactating crossbred cows. From the present study it is concluded that incorporation of 1.2% formaldehyde treated groundnut cake in the diet of growing kids resulted in higher intake as well as digestibility of nutrients.

REFERENCES :

Abdollahzadeh, F., Abbasi, R.E., Rahim, S.M. and Karim, A. (2012).Report and Opinion, **4(1):** 38-43.

Abdel-Ghani, A.A., Solouma, G.M.A., AbdElmoty, A.K.I., Kassab, A.Y. and Soliman, E.B. (2011).J. Anim. Sci.,**1(2):** 24-32.

A.O.A.C. (1995).Official Methods of Analysis, 16thEdn.Association of Official Analytical Chemists. Arlington, USA.

ARC (1998). Nutrient requirements of ruminants livestock. Supplement Commonwealth Agricultural Bureaus, England.

Dosky, K.N., Bamerny, A.O. and Ameen, G.I. (2012).Advansed Nutrition Research, **1(1):** 6-9.

Fahmy, M.H., Boucher, J.M., Poste, L.M., Gregoire, R., Bulter, G. and Comeau, J.E. (1992).Journal of Animal Science,**70**: 1365–1374.

Gurung, K., Parnerkar, S., Bhoraniya, V. and Hussain, S.K.A. (2009). Effect of feeding formaldehyde treated rapeseed on nutrient utilization of crossbred calves. Proceeding of Animal Nutrition Association World Conference.67 p.

Haddad, S.G., Nasr, R.E. and Muwalla, M.M. (2001).Small Ruminant Research, **39**: 41–46.

Paengkoum, P., Liang, J.B., Jelan, Z.A. and Basery, M. (2004). Songklanakarin Journal of Science Technology, **26**(1): 15-22

Ponnampalam, E.N., Hosking, B.J. and Egan, A.R. (2003). Meat Science, **63**: 143–149.

Ramachandran, K.S. and Sampath, K.T. (1995).Indian Journal of Animal Nutrition, **12**(1): 1-6.

Singal, J.S. (2001).Effect of feeding bypass protein and improved managemental practices on growth performance of Murrah Buffalo heifers.PhD thesis, C.C.S. Haryana Agricultural University, Hisar, India.

Singh, V.P., Nayak, S., Baghel, R.P.S., Gupta, R.S., Patil, A.K. and Khare, A.K. (2014) Indian J. Field Vet. **9(4)**, 32-34.

Snedecor, G.W. and Cochran, G.S. (1995).Statistical Methods. 8 ed. The lowa State University Press, Ames, lowa, USA.

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