EFFECT OF FEEDING FORMALDEHYDE TREATED GROUNDNUT CAKE ON GROWTH PERFORMANCE OF BARBARI KIDS

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ABSTRACT

An experiment was conducted on 14 barbari goat kids to evaluate the effect of protected ground nut cake (GNC) on performance of growing kids for 90 days. In treatment T1 (control) kids were given untreated GNC on growth performance Significant ($P<0.05$) higher body weight and average daily weight gain were recorded with kids fed on protected GNC based ration as compared to kids that were not fed bypass protein based ration (control group). Dry matter intake (DMI) of kids was not affected by feeding bypass protein based ration. Feed efficiency ratio (FER) was better ($P<0.05$) in kids fed on formaldehyde treated GNC based ration (0.17±0.00) then untreated GNC based ration (0.15±0.00

KEYWORDS: Formaldehyde treated GNC, growth performance, barbari kids.

INTRODUCTION

Inadequate feed supply is the major constraint in rearing of the small ruminants. To maximize the supply of nutrients for small ruminants with respect to their growth, production and reproduction, there is a need to increase the efficiency of existing feed resources through active and passive manipulation in rumen and feed modification in rumen. Bypass protein technology and total mixed ration (TMR) are the approaches to address this situation.

Protein is typically the most important and expensive nutrient in ration of small ruminants which needs to be efficiently utilized in biological system. Groundnut cake is one of the cheaper and most commonly used protein supplements for livestock feeding in India. However, high rumen degradability of GNC reduces its nutritive value. Formaldehyde treatment of GNC (1.2 g formaldehyde/ 100 g crude protein of protein supplement) is the common and cheaper method used for protection of protein from microbial degradation (Kanjanapruthipong et al., 2002) and supplying better amino acid profile at post ruminal tract (Sahoo et al., 2006). However, there is paucity of information on the effect of feeding formaldehyde treated GNC to kids fed on berseem based ration. Therefore, the present study was conducted to study the effect of feeding bypass protein based ration on performance of barbari kids.

MATERIALS AND METHODS

A growth trial of 90 days was carried out on fourteen barbari kids under stall fed condition to study the comparative effect of feeding compound concentrate mixture with bypass protein and without bypass protein. Kids were randomly divided into 2 groups with 7 kids in each as uniformly as possible with regard to their age and body weights and maintained on respective isonitrogenous and isocaloric rations. In treatment T1 (control) kids were given untreated ground nut cake, while in treatment T2 they were given ground nut cake chemically treated with formaldehyde (1.2 g of formaldehyde per 100 g crude protein) as a source of protein in their concentrate mixtures with concentrate and roughage, in the ratio of 50:50. The growing kids were fed individually as per ICAR (1998). The allocated amount of feed and fodder were offered and left over was collected

next morning from individual kids and daily feed intake was recorded. The body weight of individual kid was recorded at fortnightly interval in the morning before watering and feeding. Feed efficiency ratio was calculated on the basis of body weight gain and feed intake. The data was analysed using student unpaired and paired t-test as per Snedecor and Cochran (1995).

RESULTS AND DISCUSSION

Results obtained in context of the effect of feeding bypass protein based ration on performance of kids are presented in Table.

Table 1. Overall growth performance of kids during experiment

Particulars	T_1	T_2	t-values
Initial b. wt. (kg)	8.22±0.26	8.24±0.17	0.08
Final b. wt. (kg)	12.81±0.23	13.93±0.17	2.18*
Total b. wt. Gain in kg (0-90 days)	4.59±0.06	5.69±0.07	2.77*
Average daily weight gain (g)	51.05±0.69	63.22±0.76	2.77*
Average dry matter intake (g/d)	342.08±8.53	361.82±5.54	2.10
Average DMI (kg)/100 kg b. wt.	3.27±0.02	3.29±0.01	0.07
Average DMI (g)/$kg^{0.75}$	58.83±0.52	59.87±0.32	1.89
Feed efficiency ratio (FER)	0.15±0.00	0.17±0.00	2.75*

* Significant ($p<0.05$)

Growth performance

Microbial protein alone cannot satisfy the higher demands for protein in growing ruminants and this deficit may be alleviated by the inclusion of a good quality protected protein that may resist ruminal degradation. In the present study the growth rates of the kids were improved by feeding formaldehyde treated groundnut cake as bypass protein than untreated groups. The kids fed on bypass protein based ration showed significantly ($p<0.05$) higher body weight (13.93±0.17 kg) as compared to kids that were not fed bypass protein based ration (12.81±0.23 kg) and in turn total and daily weight gain was significantly ($p<0.05$) higher in kids fed on bypass based ration as compared to kids fed unprotected protein based ration . This trend could be related to the higher values of the nutrients digestibility coefficients and feeding values (TDN and DCP) in bypass based ration than in unprotected protein based ration. Moreover, many investigators indicated that the ruminal undegradable protein increases as a result of protected protein. The results of present study are in agreement with the finding of Gurung *et al.* (2009) ,Patel *et al*. (2009). and Gajanan *et al.,* 2011). Nutrient profile of these protected meals in balanced diets helps in synthesizing microbial protein which ultimately improves the digestibility of nutrients resulting in increased muscle mass accretion in growing ruminants (Chakeredza, 2003).

Dry matter intake

The results of present study revealed that feeding of bypass protein based ration as formaldehyde treated groundnut cake has no significant effect on average daily dry matter intake (g), dry matter intake per 100 kg body weight and dry matter intake per kg metabolic body size of kids. Study indicated that inclusion of bypass protein based ration in kids did not have any influence on their dry matter intake. Our results corroborated with the reports of Yadav and Chaudhary (2010) and Gajanan *et al.* (2011)

Feed efficiency ratio of growing kids

Kids fed on bypass protein based ration showed better feed efficiency ratio as compared to kids that were not fed bypass protein based ration. Better growth rate with similar dry matter intake in kids fed on formaldehyde treated groundnut cake as bypass protein may be resulted in improved efficiency of feed utilization in present experiment. Arewad *et al.* (2011) in their study reported that feed efficiency (kg/kg gain) for DM and CP was better in bypass protein supplemented group as compared to control. Similarly, Chatterjee and Walli (2003) also observed that feed conversion efficiency in terms of DM, CP and TDN was also significantly higher in the formaldehyde treated group than in untreated group. Recently, Gajanan *et al.* (2011) reported that the inclusion of formaldehyde treated protein supplements, improved feed efficiency in crossbred cows.

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