EFFECT OF FEEDING LEUCAENA LEUCOCEPHALA ON THE GROWTH RATE, NUTRIENTS UTILIZATION, RUMINAL METABOLITES AND SOME BLOOD PARAMETERS IN BUFFALO CALVES

A feeding trial was conducted for a period of 122 days including 7 days of metabolism trial to assess the effect of leucaena feeding on growth, utilization of nutrients, ruminal metabolites and certain blood parameters in fifteen Murrah male buffalo calves of about one year age, randomly distributed into 3 groups. Calves in control group (T1) were maintained on concentrate mixture and ad lib wheat straw. The protein of the concentrate mixture was replaced at two levels (25 and 50%) by leucaena protein in the rations of group T2 and T3, respectively. This was accomplished by replacing concentrate mixture with leucaena hay part by part as both the feed ingredients were isonitrogenous (CP about 19%). The CP requirement was met as per NRC recommendation. The animals of T1 were provided adequate amount of vitamin A. The mimosine, tannin and β-carotene contents of leucaena hay were 2.50%, 7.33 mg/g and 504.24 mg/kg, respectively.

The average daily dry matter intake by animals per 100 kg body weight was 2.48, 2.50 and 2.59 kg in T3, T2 and T3, respectively. The differences in the DM intake were statistically not significant (P<0.05). The average daily body weight gains were 470.2, 514.6 and 523.2 g in respective groups and these did not differ significantly. The feed/gain ratio (8.43, 7.89 and 8.08) and the gross (11.02, 12.24 and 12.54%) and net (32.78, 40.21 and 43.96%) efficiencies of ME utilization also did not differ significantly among the groups. All the animals were in positive balance for nitrogen, calcium and phosphorus. Traces of DHP (3, 4-dihydroxy pyridone) was noticed in urine of leucaena-fed animals. No ill effects of mimosine were observed in these animals. The average pH of urine was 8.87, 8.80 and 8.75 in T3, T2 and T3 groups, respectively, which were statistically similar.

At the end of the feeding trial, samples of rumen liquor were collected at 0, 2, 4 and 6 hr intervals after feeding to study the rumen fermentation pattern. Rumen pH and protozoal count were similar in all the three treatments but significantly (P<0.01) varied between the intervals. On the other hand, highly significant (P<0.01) variation between treatments as well as intervals in rumen bacterial count, total nitrogen, TCA-insoluble protein and ammonia level were recorded. The molar proportion of acetic acid significantly (P<0.05) increased in T2 and T3 and the molar proportion of propionic acid decreased significantly (P<0.01) but no variation between the intervals were noted. The molar proportion of butyric acid was unaffected in different treatments.

The blood samples of the experimental animals were also taken at the end of the feeding trial. The values of various blood
parameters like blood glucose, TVFA, plasma phosphorus, plasma protein, ammonia nitrogen and serum calcium did not differ statistically \( (P<0.01) \) in different treatments. However, the serum cholesterol level was significantly \( (P<0.01) \) lower in leucaena-fed groups \( (T_2 \text{ and } T_3) \) than the control group \( (T_1) \). The haematocrit values and haemoglobin contents were not influenced by leucaena feeding.

The feed cost per kg of gain was considerably lower in leucaena-fed groups as compared to control group.

On the basis of this feeding trial, it may be inferred that *Leucaena leucocephala* can replace 50% CP requirement of the growing buffalo calves and support a growth rate of about 500 g/day without any adverse effect.