

# Effect of Feeding *Prosopis juliflora* L. Pods in the Ration of Bullocks on Certain Blood Constituents and Rumen Metabolites

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The information on the use of *Prosopis juliflora* L. pods for feeding to cattle is scanty. Hedrick (1943) and Anon. (1954) had stated that dry pods can be utilized as a concentrate to make up for the protein deficiency of such roughages as wheat and rice straw. When fed in the dried and crushed state the pods did not show any deleterious effect on cattle. Recently Talpada *et al.* (1979) have found out nutritive value of *Prosopis juliflora* pods.

In the present investigation an attempt was made to study its effect on the blood and rumen metabolites in bullocks.

For this study a 4 x 4 latin square design with six weeks period was followed. Four adult Kankrej bullocks with average body weight of 530 kg were used as experimental animals. The four treatments T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub> were 0, 15, 30 and 45% of *Prosopis juliflora* L. pods in concentrate mixture. The bullocks were fed 2 kg of green hybrid napier and mature pasture grass *ad-lib* in addition to concentrate mixture. The DCP requirements were met as per Sen and Ray

(1971) feeding standard for maintenance.

Jugular blood samples were collected before feeding and watering from all the bullocks at the end of each period for studying the periodic changes in the haemoglobin (Hellige method) and phosphorus and calcium contents by Oser (1965) methods.

Progressive changes in the pH, total volatile fatty acids (TVFA) and the various nitrogenous constituents in rumen liquor were studied, before and 3 hours post feeding. The rumen liquor was strained through four layers of cheese cloth and the strained rumen liquor (SRL) samples were analysed for pH, TVFA by steam distillation method, NPN (non-protein nitrogen) after precipitation with trichloroacetic acid by Kjeldahl method and ammonia nitrogen by Conway (1957) method.

Statistical analysis was carried out as per the method given by Snedecor and Cochran (1968).

The proximate composition of feeds and fodders used during the feeding trials are given in Table 1.

## Effect on haemoglobin, serum phosphorus and calcium:

Changes in the blood haemoglobin, serum phosphorus and calcium were assessed periodically and the results are presented in Table 2.

The average haemoglobin value under T<sub>2</sub> was higher in all the periods

TABLE 1

Chemical composition of feeds and fodders (on % D.M. basis).

| Feed         | Concentrate mixtures |       |       |       | Hybrid napier (Green) | Mature pasture grass |
|--------------|----------------------|-------|-------|-------|-----------------------|----------------------|
|              | $T_1$                | $T_2$ | $T_3$ | $T_4$ |                       |                      |
| Constituents |                      |       |       |       |                       |                      |
| C. Protein   | 18.43                | 19.07 | 18.96 | 18.27 | 8.37                  | 2.09                 |
| E. Extract   | 5.10                 | 5.06  | 4.73  | 4.05  | 3.78                  | 2.17                 |
| C. fibre     | 10.14                | 11.13 | 11.33 | 15.71 | 28.56                 | 38.90                |
| N.F.E.       | 56.13                | 54.54 | 54.50 | 52.06 | 45.04                 | 48.37                |
| Ash          | 10.20                | 10.20 | 10.48 | 9.91  | 14.25                 | 8.47                 |
| Silica       | 3.30                 | 2.81  | 2.76  | 2.09  | 5.67                  | 6.15                 |
| P            | 0.78                 | 0.70  | 0.65  | 0.53  | 0.43                  | 0.36                 |
| Ca           | 0.55                 | 0.54  | 0.64  | 0.67  | 0.43                  | 0.40                 |

TABLE 2

Effect of feeding *Prosopis juliflora* pods at different levels on haemoglobin, phosphorus and calcium content of the blood.

| Period                       | Treatments |       |       |       | Treat. 'P' | C. D. |
|------------------------------|------------|-------|-------|-------|------------|-------|
|                              | $T_1$      | $T_2$ | $T_3$ | $T_4$ |            |       |
| Haemoglobin (g%)             |            |       |       |       |            |       |
| P <sub>1</sub>               | 11.0       | 12.5  | 11.0  | 11.5  |            |       |
| P <sub>2</sub>               | 10.5       | 12.0  | 11.0  | 11.5  |            |       |
| P <sub>3</sub>               | 12.0       | 12.0  | 10.5  | 11.0  |            |       |
| P <sub>4</sub>               | 11.4       | 13.5  | 12.3  | 11.5  |            |       |
| Average                      | 11.2       | 12.5  | 11.2  | 11.4  | 6.46*      | 0.86  |
| Phosphorus (mg/100 ml)       |            |       |       |       |            |       |
| P <sub>1</sub>               | 7.7        | 6.8   | 7.3   | 7.8   |            |       |
| P <sub>2</sub>               | 7.6        | 7.4   | 7.1   | 7.1   |            |       |
| P <sub>3</sub>               | 7.2        | 7.6   | 6.4   | 7.0   |            |       |
| P <sub>4</sub>               | 7.6        | 7.8   | 7.5   | 8.2   |            |       |
| Average                      | 7.5        | 7.4   | 7.1   | 7.5   | 1.25 N.S.  | —     |
| Calcium (mg/100 ml)          |            |       |       |       |            |       |
| P <sub>1</sub>               | 11.0       | 9.2   | 8.9   | 9.7   |            |       |
| P <sub>2</sub>               | 8.8        | 9.3   | 11.5  | 11.9  |            |       |
| P <sub>3</sub>               | 11.6       | 10.8  | 9.7   | 10.3  |            |       |
| P <sub>4</sub>               | 10.7       | 11.2  | 10.2  | 10.6  |            |       |
| Average                      | 10.5       | 10.1  | 10.1  | 10.6  | 0.21 N.S.  | —     |
| N.S. = Non-significant.      |            |       |       |       |            |       |
| * = Significant at 5% level. |            |       |       |       |            |       |

N.S. = Non-significant.

\* = Significant at 5% level.

as compared to that of T<sub>1</sub>, T<sub>3</sub> and T<sub>4</sub>. The differences between treatments were found to be statistically significant.

The average serum phosphorus concentration under T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub> were 7.5, 7.4, 7.1 and 7.5 mg per cent respectively. There seems to be no treatment effect on the serum phosphorus content.

The results on the serum calcium content revealed no significant difference due to different treatments. The

values were in normal physiological range (Rao *et al.* 1966, Patel *et al.* 1969).

Thus blood studies revealed that there was no adverse effect of feeding *Prosopis juliflora* pods on haemoglobin, serum phosphorus and serum calcium levels in adult bullocks.

#### Effect on SRL, pH, NPN, Ammonia-N and TVFA :

The average results on pH, TVFA, NPN and ammonia-N are presented in Table 3.

TABLE 3

Effect of feeding *Prosopis juliflora* L. pods at different levels on rumen metabolites.

| Treatments     | Hrs | pH        | NPN<br>(mg/100 ml) | Ammonia<br>(mg/100 ml) | TVFA<br>(mg/100 ml) |
|----------------|-----|-----------|--------------------|------------------------|---------------------|
| T <sub>1</sub> | 0   | 7.80      | 25.13              | 0.52                   | 390.25              |
|                | 3   | 7.80      | 31.57              | 0.86                   | 432.75              |
| T <sub>2</sub> | 0   | 7.70      | 25.20              | 0.64                   | 394.75              |
|                | 3   | 7.70      | 36.33              | 0.94                   | 444.25              |
| T <sub>3</sub> | 0   | 7.60      | 24.22              | 0.48                   | 380.00              |
|                | 3   | 7.50      | 35.84              | 1.04                   | 450.75              |
| T <sub>4</sub> | 0   | 7.60      | 27.16              | 0.52                   | 385.50              |
|                | 3   | 7.50      | 30.03              | 1.05                   | 440.25              |
| Treat. 'F'     |     |           |                    |                        |                     |
| Value          | 0   | 0.38 N.S. | 0.47 N.S.          | 2.50 N.S.              | 1.11 N.S.           |
|                | 3   | 2.00 N.S. | 1.143 N.S.         | 2.00 N.S.              | 0.59 N.S.           |

N.S. = Non-significant.

It was observed that the average pH values for T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub> were 7.8 and 7.8, 7.7 and 7.7, 7.6 and 7.5 and 7.6 and 7.5 at 0 and 3 hrs respectively. The differences between different treatments were found to be non-significant. This showed that inclusion of *Prosopis juliflora* pods in the concentrates did not alter the pH of rumen.

The mean NPN, ammonia and TVFA concentration in SRL under

different treatments at 0 and 3 hrs did not differ significantly.

The overall results indicated that there was no adverse effect of feeding *Prosopis juliflora* L. pods at different levels on blood and rumen metabolites.

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