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# Effect of Feeding *Prosopis juliflora* Pods on Dry Matter Intake, Digestibilities and Balances of Nutrients by Calves

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**ABSTRACT**

**An experiment was conducted on 6 (3 males and 3 females cross bred ($F_1$-Kankrej x Jersey) calves in a 3 x 3 latin square design for eight weeks. Two separate latin squares one on female and the other on male calves were studied. The three treatments were control ($T_1$), 10% *Prosopis juliflora* pods ($T_2$) and 20% *Prosopis juliflora* pods ($T_3$) in the concentrate mixtures. The DCP requirements were met by feeding 2 kg of NB-21 green fodder and concentrate mixture as per Sen and Ray (1971) feeding standards. At the end of each period, metabolism trials were conducted by conventional method.**

**Average daily dry matter consumption was 3.09, 3.01 and 3.05 kg for male calves and 2.32, 2.76 and 2.70 kg for female calves per 100 kg body weight in $T_1$, $T_2$ and $T_3$ respectively. The digestibility of proximate nutrients were more or less similar in all the treatments. Nitrogen, phosphorus and calcium balances were positive in all the treatments for both sexes. Thus, the results of metabolism study indicated that the *Prosopis juliflora* pods upto 20% level in the ration of calves had no adverse effect on metabolism of nutrients.**

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## INTRODUCTION

Recently attention has been paid for plantation of *Prosopis juliflora* trees by forest department. Mahadevan (1954) and Talpada *et al.* (1979) reported that its pods possess a high nutritive value. To find out the possibility of utilizing *Prosopis juliflora* pods in ration of calves an experiment was conducted on cross bred Kankrej x Jersey $F_1$ calves.

## MATERIALS AND METHODS

A 3 x 3 latin square design for eight weeks period was followed. Two latin squares were studied one on female and the other on male calves of 9 to 12 months age. The three treatments were control ($T_1$), 10% *Prosopis juliflora* pods ($T_2$) and 20% *Prosopis juliflora* pods ($T_3$) in the concentrate mixtures (Table-1). The DCP requirements were met by feeding 2 kg. of green NB-21 fodder and concentrate as per Sen and Ray (1971) feeding standards for growing animals. *Ad-lib* quantity of mature pasture grass was fed.

At the end of each period metabolism trials were conducted by conventional methods and samples of feeds, feces and urine were collected and were analysed according to A.O.A.C. (1970)

methods. Data were analysed statistically according to Snedecor and Cochran (1968).

*TABLE 1*

**Per cent proportion of different ingredients used in the concentrate mixtures.**

| *Treatments* | $T_1$ | $T_2$ | $T_3$ |
|---|---|---|---|
| *Ingredients* | | | |
| Cotton seed cake | 12 | 12 | 22 |
| *Guar chuni* | 10 | 10 | 0 |
| Rice polish | 10 | 10 | 10 |
| Groundnut cake | 25 | 25 | 25 |
| Wheat bran | 10 | 10 | 10 |
| Tapioca waste | 20 | 10 | 0 |
| *Prosopis juliflora* pods | 0 | 10 | 20 |
| Molasses | 10 | 10 | 10 |
| Bone meal | 1 | 1 | 1 |
| Salt | 2 | 2 | 2 |
| Calculated D.C.P. | 17.2 | 17.2 | 17.2 |
| Calculated T.D.N. | 66.2 | 66.6 | 66.7 |

## RESULTS AND DISCUSSION

The average chemical composition of feeds and fodders used in the experiment are given in Table-2.

It is revealed that the chemical composition of the feeds and fodders analysed during different periods was more or less the same.

### Effect on dry matter intake:

The daily dry matter intake kg/100 kg body weight was worked out under each treatment and the data are presented in Table-3.

The average daily dry matter intake was higher in male calves as compared to female calves under all the treatments and the difference was significant. The difference between the different treatments were not significant. Thus, these results suggested that there was no adverse effect on dry matter intake when *Prosopis juliflora* pods up to 20% level was incorporated in the

*TABLE 2*

**Average chemical composition of feeds and fodders (on % D.M. basis).**

| *Constituents* | *Con. Mix. I* | *Con. Mix. II* | *Con. Mix. III* | *N.B. 21 green* | *Mature pasture grass* | *Chalk* |
|---|---|---|---|---|---|---|
| | | | *Latin square–I* | | | |
| C. Protein | 21.71 | 22.00 | 23.39 | 11.85 | 2.17 | |
| E. Ext. | 3.10 | 3.47 | 3.69 | 4.12 | 1.82 | |
| C. Fibre | 10.00 | 9.21 | 10.68 | 22.60 | 37.44 | |
| N.F.E. | 52.68 | 52.58 | 49.12 | 47.04 | 49.61 | |
| Ash | 12.51 | 12.74 | 13.12 | 14.39 | 8.96 | |
| Silica | 2.45 | 2.31 | 2.62 | 5.53 | 6.08 | |
| P | 0.75 | 0.78 | 0.82 | 0.60 | 0.03 | |
| Ca | 0.77 | 0.74 | 0.67 | 0.55 | 0.38 | 30.27 |
| | | | *Latin square–II* | | | |
| C. Protein | 22.64 | 22.86 | 24.27 | 11.73 | 1.85 | |
| E. Ext. | 3.18 | 3.69 | 3.54 | 4.02 | 1.52 | |
| C. Fibre | 9.22 | 10.26 | 12.13 | 26.18 | 38.90 | |
| N.F.E. | 53.43 | 51.72 | 48.51 | 45.54 | 49.60 | |
| Ash | 11.53 | 11.47 | 11.55 | 12.53 | 8.13 | |
| Silica | 2.45 | 2.39 | 2.35 | 4.76 | 5.89 | |
| P | 0.84 | 0.80 | 0.86 | 0.56 | 0.03 | |
| Ca. | 0.79 | 0.76 | 0.73 | 0.54 | 0.43 | 30.27 |

*TABLE 3*

**Daily dry matter intake kg/100 kg body weight.**

| *Treatment* | *Male calves* | | | *Female calves* | | | *Treat 'F'* |
|---|---|---|---|---|---|---|---|
| *Period* | $T_1$ | $T_2$ | $T_3$ | $T_1$ | $T_2$ | $T_3$ | |
| $P_1$ | 3.48 | 3.40 | 3.25 | 2.85 | 3.06 | 3.17 | |
| $P_2$ | 3.17 | 2.79 | 3.14 | 2.88 | 2.70 | 2.36 | 1.23 NS |
| $P_3$ | 2.63 | 2.83 | 2.76 | 2.73 | 2.52 | 2.58 | |
| Av. | 3.09 | 3.01 | 3.05 | 2.82 | 2.76 | 2.70 | |

*TABLE 4*

**Digestibility co-efficients of proximate nutrients (Whole ration).**

| *Treatment* | *Male calves* | | | *Female calves* | | | *Treatment 'F'* |
|---|---|---|---|---|---|---|---|
| *Nutrients* | $T_1$ | $T_2$ | $T_3$ | $T_1$ | $T_2$ | $T_3$ | |
| C. Protein | 58.13 | 58.97 | 60.43 | 59.37 | 61.98 | 60.95 | 1.32 NS |
| E. Ext. | 54.47 | 55.77 | 56.43 | 58.88 | 57.53 | 56.63 | 0.004 NS |
| C. fibre | 71.75 | 67.50 | 67.85 | 70.09 | 69.60 | 67.15 | 4.05 NS |
| N.F.E. | 55.11 | 50.48 | 50.89 | 56.44 | 54.98 | 52.34 | 1.64 NS |
| O. Matter | 60.37 | 56.55 | 57.18 | 60.90 | 60.30 | 58.08 | 1.66 NS |

*TABLE 5*

**Balances of nitrogen, phosphorus and calcium (g/day/animal).**

| *Treatments* | *Male calves* | | | *Female calves* | | | *Treatment 'F'* |
|---|---|---|---|---|---|---|---|
| *Particulars* | $T_1$ | $T_2$ | $T_3$ | $T_1$ | $T_2$ | $T_3$ | |
| | | | *Nitrogen* | | | | |
| Total intake | 103.83 | 105.57 | 111.37 | 108.96 | 107.78 | 109.59 | |
| Voided in feces | 43.66 | 43.30 | 44.03 | 44.18 | 40.93 | 42.78 | |
| Voided in urine | 32.35 | 37.45 | 41.57 | 39.67 | 43.72 | 48.78 | |
| Total voided | 76.01 | 80.75 | 85.60 | 83.85 | 84.65 | 91.56 | |
| Balance | +27.82 | +24.82 | +25.77 | +25.11 | +23.13 | +18.03 | 3.46 NS |
| | | | *Phosphorus* | | | | |
| Total intake | 21.17 | 22.04 | 23.02 | 24.07 | 22.62 | 23.26 | |
| Voided in feces | 13.92 | 14.67 | 15.15 | 18.50 | 17.03 | 20.46 | |
| Voided in urine | 0.47 | 0.38 | 0.71 | 0.06 | 0.07 | 0.08 | |
| Total voided | 14.39 | 15.05 | 15.86 | 18.56 | 17.10 | 20.54 | |
| Balance | +6.78 | +6.99 | +7.16 | +5.51 | +5.52 | +2.72 | 0.80 NS |
| | | | *Calcium* | | | | |
| Total intake | 42.92 | 42.25 | 40.76 | 46.03 | 44.28 | 42.75 | |
| Voided in feces | 31.23 | 32.49 | 31.75 | 33.40 | 30.70 | 31.10 | |
| Voided in urine | 1.05 | 1.41 | 1.30 | 1.18 | 1.19 | 1.31 | |
| Total voided | 32.28 | 33.90 | 33.05 | 34.58 | 31.89 | 32.41 | |
| Balance | +10.64 | +8.35 | +7.71 | +11.45 | +12.39 | +10.34 | 0.30 NS |

Ns = Non Significant.

concentrate mixture fed to calves. Similar results were also observed by Gujarathi *et al.* (1981).

**Effect on digestibility of proximate nutrients:**

The digestibility co-efficients of rations are presented in Table-4.

The results revealed that there were no marked differences in crude protein, e.extract, crude fibre, N.F.E. and organic matter digestibility of whole rations. They were more or less similar in all the three treatments and in both the sexes. The results were found to be statistically non-significant. Gujarathi *et al.* (1981) also reported that feeding of *Prosopis juliflora* pods up to the level of 45% in concentrate to bullocks did not adversely affect the digestibility of proximate nutrients.

**Effect on balances of nitrogen and minerals:**

The data on balances of nitrogen and minerals are presented in Table-5.

The results of the nitrogen, phosphorus and calcium balances were positive in all the three treatments and in both the sexes. The treatment differences for nitrogen, phosphorus and calcium were found to be statistically non-significant. Gujarathi *et al.* (1981) observed that the nitrogen and calcium balances were positive and phosphorus balance was negative at 45% level of *Prosopis juliflora* pods in concentrate mixture fed to bullocks. They also pointed out that at higher level of *Prosopis juliflora* pods, i.e. at 45% level it should be fed with some phosphorus rich concentrate or mineral mixture containing phosphorus.

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