*Karnataka J. Agric. Sci.,18(1):(110-113) 2005*

# Evaluation of Chemical, Nutritive and Feeding Value of Rain Tree Pods

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*(Received: March, 2004)*

**Abstract:** Sixteen HF x Deoni crossbred heifers of similar age (9±1 months) and body weight (130±5 kg) were randomly distributed in two equal groups. All the heifers were offered *ad libitum* green paragrass and maize straw. Concentrate was offered to meet the requirement. First group was control and the second group was supplemented with ad libitum rain tree pods. The pods contained 15.3% crude protein, 69.9% nitrogen free extract,.10.0% total sugars, 10.1 % crude fibre, 4.5% lignin, 0.20% silica, 0.84% calcium,O.77% phosphorus, 140 mg/kg iron, 9.8 mg/kg copper and 2.95% tannin. The intake of dry matter, digestible crude protein and digestibility of nitrogen free extract were significantly ($P<0.05$) higher in pods supplemented group over control. The intake of total digestible nutrients and digestibility of dry matter, organic matter, crude protein, ether extract and crude fibre did not vary significantly between groups. The digestible crude protein, total detestable nutrients, digestible energy, metabolizable energy of rain tree pods were 7.88 and 58.67%, 2587 and 2090 K Cal/kg, respectively and nutritive ratio was 6.45. Therefore, the rain tree pods can very well be incorporated in the ration of ruminants to reduce the feeding cost significantly.

## Introduction

Rain tree (*Samanea saman)* is widely distributed in the tropics. It is propagated by seeds and cuttings and thrive best in hot moist localities and dry baren lands. Throughout Kamataka rain trees are grown all along the road sides and gardens as avenue trees. It is a large deciduous tree of 60-80 feet height with a short bole and broad spreading crown. Leaves are bipinnate, shinning above and downy beneath, folding and dropping at night or on approach of rain. Flowers are solitary and pinkish. Pods are sessile indehiscent, 6-8 inches long and half to one inch broad, flattened, containing 10-12 seeds embedded in a sugary edible pulp (Anon., 1952). A mature tree can yield about 500-600 kg green forage foliage and 250-300 kg pods per annum. The leaves and pods of the trees are esteemed as fodder for livestock. Ripen pods are available from February to May, when other fodders are scarce (Venkataraman, 1943 and Kehar and Negi, 1949). The ripen pods fall on the ground and go waste. In order to utilize the pods and to exploit their nutritive and feeding value, efforts have been made to include in the ration for cattle.

## Material and Methods

Sixteen HF x Deoni crossbred heifers of about 9±1 months old, around 130±5 kg body weight were selected and randomly distributed into two groups of 8 each. All the heifers were maintained on ideal and hygienic managemental conditions and with individual feeding facility. All the heifers were offered *ad libitum* green paragrass and maize straw. Each heifer in both the groups was offered concentrate mixture (Maize-25, deoiled rice bran-46, sunflower extraction-26, mineral mixture 2 and salt 1 parts) daily to meet the requirement as per NRC standards (Anon., 1989). First group was control and the second group was supplemented with *ad libitum* rain tree pods. After 21 day's of feeding a digestibility trial of 7 day's collection was conducted. To evaluate the nutrient utilization, the feeds, fodder and

faeces were analysed for proximate principles as per AOAC method (Anon., 1980). Fiber constituents were analysed as per Van Soest (1967) and the nutritive value of pods was calculated by difference method. The data was subjected to statistical analysis by two way analysis (Snedecor and Cochran, 1967).

**Results and Discussion**

Chemical composition of rain tree pods is presented in table 1. Pods contain higher crude protein (15.31 %), nitrogen free extract (69.93%), total sugar (1 0.0%), lower crude fibre (10.07%), neutral detergent fibre (42.86%), acid detergent fibre (32.33%), silica (0.20%), lignin (4.50%) and tannin (2.95%). In the pods hemicellulose (10.53%) was higher than cellulose (9.77%). Calcium was 0.84, phosphorus 0.77%, iron 140 and copper 9.8 mg/kg pod. The chemical composition of pods indicated that it is equivalent to any cereal grain byproducts like deoiled rice bran. Similar chemical composition in rain tree pods reported by Thomas *et al*. (1976b), Thole *et al*. (1992) and Hosamani *et al*. (2000).

The intake and digestibility of nutrients are presented in table 2. The daily voluntary consumption of pods in the second group was 3.25 kg. The intake of dry matter and digestible crude protein was significantly (P<0.05%) higher in pods fed group over control, whereas the intake of total digestible nutrients was non significantly increased in experimental group than control. The additional supplementation of pods have increased the intake of dry matter, digestible crude protein and total digestible nutrients. There was no significant change in the intake of nutrients

Table 1. Chemical composition of rain tree pods

| Chemical constituents | Composition (%DM) Basis |
|---|---|
| Dry matter | 85.50 |
| Organic matter | 96.81 |
| Crude protien | 15.31 |
| Either extract | 1.50 |
| Crude fibre | 10.07 |
| Nitrogen free extract | 69.93 |
| Total ash | 3.19 |
| Neutral detergent fibre | 42.86 |
| Acid detergent fibre | 32.33 |
| Cellulose | 9.77 |
| Hemicellulose | 10.53 |
| Lignin | 4.50 |
| Total sugar | 10.00 |
| Reducing sugar | 5.40 |
| Calcium | 0.84 |
| Phosphorous | 0.77 |
| Magnesium | 0.05 |
| Iron (mg/kg) | 140 |
| Zinc (mg/kg) | 128 |
| Copper (mg/kg) | 9.80 |
| Silica | 0.20 |
| Tannin | 2.95 |

Table 2. Intake and digestibility of nutrients by crossbred heifers

| Attributes | Group I | Group II |
|---|---|---|
| Intake | | |
| Pods (kg) | - | 3.25±0.35 |
| Total dry matter * (Kg) | 4.74±0.23 | 5.65±0.19 |
| Digestible crude protien * (g) | 172.24±12.84 | 255.31±15.14 |
| Total digestible nutrients (kg) | 1.99±0.11 | 2.43±0.13 |
| Digestibility (%) | | |
| Dry matter | 41.91±2.10 | 42.14±1.80 |
| Organic Matter | 44.74±1.69 | 46.96±1.99 |
| Crude protien | 45.12±4.54 | 46.44±3.80 |
| Ether extract | 54.19±4.50 | 55.09±4.06 |
| Crude fibre | 53.70±4.05 | 49.74±2.48 |
| Nitrogen free extract* | 40.91±4.29 | 48.20±1.87 |

* ($p>0.05$)

observed in goats (Thomas *et al.,* 1976b) or in cattle (Thole *et al*., 1992), probably due to the level and processing of pods in the diet. The digestibility of nitrogen free extract was significantly ($P<0.05$) improved in pods supplemented group over control which might be due to higher NFE in the pods. Though the digestibility of dry matter, organic matter, crude protein and ether extract was slightly higher in pods fed group than in the control, the difference was non significant. The easy availability of sugars from pods might have increased the digestibility of these nutrients. Similar results have been indicated by feeding rain tree pods in sheep (Kathaperumal *et al*., 1988) and in cattle (Thole *et al*.,1992). The digestibility of crude fibre was non-significantly reduced in pods fed group when compared with the control which could be due to more intake of basal roughage in control group and shift of microbes towards easily fermentable sugars present in pods fed group (Thomas *et al*., 1976b and Thole *et al*., 1992).

The nutritive value of pods is presented in table 3. Rain tree pods contain 7.88% digestible crude protein, 58.67% total digestible nutrients, 2587 K Cal/kg digestible energy, 2090 K Cal/kg metabolize energy with 6.45 nutritive ratio. These results corroborate the findings of Thomas *et al*. (1976a) and Thole *et al*. (1992). The nutritive value in rain tree pods was almost equivalent to cereal grain byproducts such as de oiled rice bran.

Table 3. Nutritive value of rain tree pods

| Particulars. | Nutritive value |
|---|---|
| Digestible crude protein (%) | 7.88 |
| Total digestible nutrients (%) | 58.67 |
| Digestible energy (K.Cal/kg) | 2587 |
| Metabolizable energy (K.Cal/kg) | 2090 |
| Nutritive ratio | 6.45 |

It was inferred that rain tree pods contain higher protein and sugars, lower fibre, silica, lignin and tannin. It has got better digestible crude protein and total digestible nutrients equivalent to cereal grain by products. The rain tree pods can very well be incorporated in the diet of ruminants to replace concentrate to reduce the cost of feeding significantly.

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