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# The Utilization of Fig (*Ficus thonningii*) and Mango (*Mangifera indica*) Leaves by Rabbits

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**Abstract:** A study lasting 42 days was carried out to determine the intake and utilization of Fig *Ficus thonningii* and Mango *Mangifera indica* leaves by rabbits. 10 weaner rabbit of average weight 700g were randomly assigned to 2 treatment groups in a completely randomized design. The results of the study showed that the intake of *Ficus thonningii* leaves was significantly (P>0.01) higher than that of *Mangifera indica* leaves. Both treatments however, showed consistent increase in dry matter intake throughout the experimental period. Rabbit fed *Ficus thonningii* leaves had significantly (P>0.01) higher average daily weight gain and feed/gain efficiency. Bases on the result of this study, it is concluded that *Ficus thonningii* and *Mangifera indica* leaves have feeding value as fodder for rabbits. These plants can be used as standing feed reserve so that rabbits can survive critical periods of feed scarcity during the dry season.

**Key words:** Rabbits, *Ficus thonningii, Mangifera indica*, leaves, utilization

## Introduction

The basic forage resources at present come from the natural vegetation. The arid and semi-arid zones are characterized by long dry season, and forage during this season is dry and of low quality (Devendra, 1990). In order to sustain growth rate and reproduction throughout the year, alternative sources of green forages must be sought, particularly in the dry season. The fluctuation in feed supply with attendant shortages in dry season can be alleviated by proper conversion of excess forages and crop residues during the wet and harvest periods, respectively (Otaru, 1998). In the dry season, primary attention is diverted to forages that remain green and succulent, and are competed for by other animals like sheep, goats and cattle.

Browse plants play significant role in animal production primarily by providing animals with feed resources rich in protein, energy, vitamins and minerals at a time when food is scarce or of low quality (Obi and Tuley, 1973). Browses either in form of fodder trees, shrubs from an integral part of tropical farming systems (Smith, 1993).

Browse forms an important component of the diets of goats, camel and, to a lesser extent, sheep and cattle (Devendra and Burns, 1983). In Northern Africa, browse forms 60 - 70% of rangeland production and 40% of total available animal feed in the region (Le Hoverou, 1980). The use of browse as sole feed for goats have been reported by Ademosun *et al.* (1988).

Although the nutritional potential of tropical forages are enormous for rabbits, many producers do not know the right type of forages to use and their nutritional contents. It has been reported that some forages such as *Leucaena leucephala* and *Zornia glochideato* can impair the growth rate of rabbits (Agishi, 1985).

This study is carried out to determine the feed intake, growth rate and feed efficiency of rabbits fed *Ficus thonningii* and *Mangifera indica* leaves.

## Materials and Methods

This experiment was conducted at the rabbitry unit of the Department of Animal Science, ABU., Zaria, Nigeria. Ten rabbits weighing an average of 700g were used for this study, which lasted 42 days. A completely randomized design was used comprising of 2 dietary treatment groups to which the animals were assigned to give five rabbits per treatment.

The experimental diets consisted of *Ficus thonningii* and *Mangifera indica* leaves cut the previous day and given to animals at 8.00h daily. This was provided *ad libitum*. A concentrated supplement (16% CP) was also provided at the rate of 2% body weight per rabbit per day. During each feeding time, the animals were first given the concentrate ration and subsequently *Ficus* and *Mangifera* leaves. Water was provided *ad libitum*. Feed intake was determined by the difference between the amount of feed offered and that, which was left over the next day. Rabbits were weighed weekly.

The data was analyzed using t-test analysis of variance (ANOVA), (Snedecor and Cochran, 1967).

## Results

Table 1 gives the ingredient and proximate composition of supplemental diet. Proximate composition of *Ficus thonningii* and *Mangifera indica* leaves is shown in Table 2. *Ficus thronningii* had a higher percentage DM, CP and ash values. Values for NFE and EE are similar while CF is higher in *Mangifera indica* leaves.

The mean weekly (Table 3) DM intake of *Ficus thonningii* and *Mangifera indica* leaves was significantly higher (P>0.01) in *Ficus thonningii* treatment than *Mangifera indica* through out the period of the study even though both treatments showed consistent increase in DM

Table 1: Ingredient and proximate composition of supplemental diet

| Ingredient% | (%) |
|---|---|
| Maize | 69.23 |
| Soybean | 21.00 |
| Rice offal | 5.00 |
| Bone meal | 2.00 |
| Limestone | 2.00 |
| *Vit/min premix | 0.20 |
| Salt | 0.50 |
| Proximate analysis | |
| Dry matter | 75.01 |
| Crude protein | 16.02 |
| Crude fibre | 5.12 |
| Nitrogen free extract | 65.24 |
| Ether extract | 4.59 |
| Ash | 6.42 |

*Premix furnished the following per kg of cliet: 1300 I u vit A; 2680i u vit D; 10 I u vit E; 2.68mg vit K; 6mg vit $B_2$; 4mg Niacin; 10.68mg D-pantolhenic acid; 0.02mg vit $B_{12}$, 0.668mg folic acid, 400mg choline chloride. 26.68mg chsiortetracyline, 166.68mg Dinitro-orthtotuamide. 133.34mg Mn; 66.68mg Fe, 54.34kg Zn, 3.2mg Cu, 1.868mg iodine, 0.268mg cobalt and 0.108mg Se.

Table 2: Proximate composition of *Ficus thonningii* and *Mangifera indica* leaves

| Composition | *Ficus thonningii* | *Mangifera indica* |
|---|---|---|
| Dry matter | 54.32 | 52.98 |
| Crude protein | 18.50 | 17.44 |
| Crude fibre | 16.22 | 22.58 |
| Nitrogen free extract | 42.40 | 42.85 |
| Ether extract | 5.54 | 5.84 |
| Ash | 17.34 | 11.29 |

Table 3: Mean weekly Dry matter intake (g) off *Ficus thonningii* and *Mangifera indica* leaves by rabbits

| Week | *Ficus thonningii* | *Mangifera indica* | SEM |
|---|---|---|---|
| 1 | 639.67$^a$ | 287.24$^b$ | 31.83 |
| 2 | 694.66$^a$ | 292.56$^b$ | 140.22 |
| 3 | 887.26$^a$ | 418.44$^b$ | 128.08 |
| 4 | 950.71$^a$ | 409.00$^b$ | 12.55 |
| 5 | 959.18$^a$ | 433.16$^b$ | 13.69 |
| 6 | 962.76$^a$ | 447.36$^b$ | 9.36 |
| Total feed intake | 5094.24$^a$ | 2285.76$^b$ | 48.26 |
| Average Daily Feed intake | 121.23$^a$ | 54.42$^b$ | 12.81 |

a,b mean values on the same row with different superscripts differ significantly (P<0.01)

intake as the period of the study increased. All concentrate supplement offered was consumed daily.

Table 4 shows the live weight changes and feed efficiency of rabbits fed *Ficus thonningii* and *Mangifera indica* leaves. The average daily weight gain and feed efficiency of rabbits fed the *Ficus thonningii* treatment was significantly (P>0.01) higher than those of the *Manifera indica* leaves.

Table 4: Live weight changes (g) and feed efficiency of rabbits fed *Ficus thonningii* and *Mangifera indica* leaves by rabbits

| Parameters | *Ficus thonningii* | *Mangifera indica* | SEM |
|---|---|---|---|
| Initial weight | 700 | 700 | - |
| Final weight | 1500$^a$ | 1300$^b$ | 0.26 |
| Total weight gain | 320$^a$ | 120$^b$ | 212 |
| Average daily weight gain | 7.62$^a$ | 2.86$^b$ | 6.48 |
| Feed efficiency | 15.9$^a$ | 19.05$^b$ | 12.6 |

a,b mean values on the same row with different superscripts differ significantly (P<0.01)

## Discussion

The proximate composition of *Ficus thonningii* and *Mangifera indica* show that except for the values of CF, which is lower (16.22%) in *Ficus thonningii* than in *Mangifera indica* leaves (22.58%) and ash where the content is also lower in *Mangifera indica* leaves (11.29%) than in *Ficus thonningii* leaves, the two experimental diets are similar and comparable in their content of DM, CP, NFE and EE.

The high crude fibre content of the *Mangifera indica* leaves might have accounted for the lower intake. Aduku *et al.* (1989) also observed that it was poorly accepted by rabbits. This was attributed to the fibrous nature and hard texture (Milligan and Sule, 1982). The increase in DMI over time also indicates the adaptability of the rabbits to these browse plants over time. This was reported by Otaru (1998).

The average daily DMI obtained in this study is higher than values (71.3g/day) obtained by Pote *et al.* (1980), and Aduku *et al.* (1989). Rabbits on the *Ficus thonningii* treatment had a significantly (P<0.05) higher average daily weight gain compared to those on *Mangifera indica* leaves. The results obtained in this study are however, below the value obtained by Otaru (1994) and Pote *et al.* (1980).

The feed conversion efficiency is also high when compared to what was reported by Abdulmalik *et al.* (1994) where rabbits were fed mucuna forage.

Based on the results of this study, it is concluded that *Ficus thonningii* and *Mangofera indica* have feeding value as fodder for rabbits. These browse plants can be use as standing feed reserve so that rabbits can survive critical periods of feed scarcity during the dry season without weight losses.

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