

## NEW FOOD RESOURCES FOR RABBITS IN MAURITIUS

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REDUIT - MAURITIUS

## SUMMARY

The possibility of using *Saccharum officinarum*, *Leucaena leucocephala*, *Stenotaphrum dimidiatum*, *Chloris gayana* and *Pennisetum purpureum* was studied. In the first experiment all these species were compared with a prepared standard feed. There was no significant difference between the standard diet and *Saccharum* spp. and *Stenotaphrum* spp. *Leucaena* sp. proved to be better than the standard diet. In the second and third experiments with different levels of *Saccharum* sp. and *Leucaena* sp. results showed that the replacement of up to 40% of the standard diet in growing rabbits seems to be possible without affecting the performances of the animals.

The major task in the field of Rabbit Production in Mauritius since 1977 has been to investigate into the causes of the fast declining industry. Three major rabbit enterprises were compelled to close down (1). In 1975, there was an estimated number of 17,000 rabbits (2). This was reduced to less than 5,000 (3) by the end of 1977. During the past three years the Ministry of Economic Planning has invested and lost over half a million rupees during an attempt to encourage rabbit keeping as back yard farming. In this direction, the main effort at village level has lied with the Young Farmers' clubs and Agricultural Youth Clubs.

The problems have been those of husbandry, disease and nutrition. Most of the time spent during 1977 and 1978 by the investigator has been on improving upon the general management, including housing and combating the prevalent diseases. There has subsequently been a marked improvement in the survival rate. Mortality rate which was found to be over 80% (signalled in 1977 to International Foundation for Science) was reduced to nearly 10% at the place of investigation before works on nutrition were started.

Nutrition studies became necessary when a survey revealed that New Zealand White and Chinchilla rabbits kept under village conditions on grasses gathered from the adjacent sugarcane fields, took up to nine months to reach a weight of 2500g. On the other hand, the Ministry of Agriculture sells to rabbit keepers N.Z.W. rabbits weighing about 2500g after five to six months. The Ministry uses mainly sweet potato leaves, *Setaria* spp. and *Stenotaphrum* spp. supplemented by concentrate manufactured by the Government Livestock Feed Factory containing the following ingredients: Groundnut cake, maize, cotton seed (all three being imported), Dicalcium phos, molasses, vitamin mineral supplements with an overall protein content of 18.7%.

The primary step was therefore to import a complete rabbit feed which could then be used both as a standard diet and to boost up the nutritional status.

Coincidentally, at the beginning of 1978, a new private commercial feed factory became operational and has provided a reasonable complete rabbit feed using Lucerne, Wheat bran, Fish meal (all three being imported), Limestone, pre-mix vitamins and minerals as ingredients and with the following composition: Protein (min 16.0%, Fat (min 2.5%, Fibre (max) 17.0%, Calcium (max) 1.5%, Phosphorus (min) 0.7%.

Although the growth rate has improved (rabbits reached 2500g in three months), the cost is far above what the farmer can afford. Consequently, the few remaining commercial rabbit producers are seriously thinking of closing down their business (4).

The aim of the investigation is to find out the growth rates using locally available substitutes for the imported ones to ultimately produce a feed that will be both cheap and comparable with the standard diet while still producing an acceptable growth rate.

The work studies the possibility of incorporating new products, rich in protein and energy, so far not utilized to meet the nutritional needs of growing rabbits. The values of these products cannot be judged solely by their composition. In fact, the performance depends on all nutritional elements and their interaction. Only an experiment carried out directly on the growing animals will enable us to determine the extent to which these products can be used as rabbit feeds. The species selected were *Saccharum officinarum*, sugarcane; *Leucaena leucocephala*, Mauritian Acacia; *Stenotaphrum dimidiatum*, Herbe Bourrique; *Chloris gayana*, Mauritian variety; *Pennisetum purpureum*, Mauritian elephant grass. They are commonly available, abundant, with high yield and can easily be cultivated.

Experiment I

Thirty six of almost equal weights with age ranging from forty-five to fifty-two days. N.Z.W. rabbits, were divided into six groups with six animals in each group, each animal kept in a separate cage. The treatments were as follows:

- Group I - Complete Rabbit Pellets (CRP)
- Group II - 50% CRP + Saccharum spp. (Ad lib)
- Group III - 50% CRP + Leucaena spp. (Ad lib)
- Group IV - 50% CRP + Stenotaphrum spp. (Ad lib)
- Group V - 50% CRP + Chloris spp. (Ad lib)
- Group VI - 50% CRP + Pennisetum spp. (Ad lib)

An electrical humus chooper was used to grind the sugarcane. The other species were fed without physical modification.

Proximate analyses gave the following information

TABLE I

Species	Moisture	C.P.	C.F.	Ether Extract	N.F.E.	Ash
Saccharum	74.5	1.7	24.6	3.6	70.1	0.5
Leucaena	77.1	28.0	12.5	4.6	49.2	56.0
Stenotaphrum	79.2	14.0	28.0	4.1	47.9	6.0
Chloris	79.0	6.7	29.3	2.7	53.3	8.0
Pennisetum	87.1	13.0	27.0	5.6	43.4	11.0

RESULTS AND DISCUSSIONS

TABLE II - Liveweights and Daily Liveweight Gain

Group	LIVE WEIGHTS (group Average)		D.W.G.		
	Initial (g)	Final (g)	First (15 days)	Second (15 days)	Final (30 days)
I	795	1805	31.8	39.0	33.7
II	800	1745	35.4	31.4	31.5
III	805	1960	43.9	37.5	38.5
IV	790	1771	34.3	37.2	32.7
V	792	1587	26.1	32.0	26.5
VI	807	1677	32.9	30.7	29.0

During the first fortnight the daily weight gain was the best in case of Acacia, followed by sugarcane, Stenotaphrum, elephant grass and Chloris. However, in the third and fourth weeks, the daily weight gain for pellets surpassed the rest. However, rabbits on Acacia and Stenotaphrum performed fairly well.

At the end of the experiment, results of a randomised block design analysis showed no significant differences between Group I and Groups II and IV. But there were significant differences at 5% level between Group I and Groups III, V and VI.

The mean difference between the groups were as follows:

- For Groups I and III..... 4.83
- For Groups I and V ..... 7.17
- For Groups I and VI ..... 4.67

It can be assumed that Leucaena sp., Saccharum sp. and Stenotaphrum sp. can be used to cut down the use of the complete rabbit pellets by 50%. The performance of Pennisetum sp., having a high protein content, would have been improved had it been ground with the humus chopper. Rabbits found the ground elephant grass more acceptable. The good performance of sugarcane may be attributed to its high energy content and an adequate amount of protein obtained from the pellets.

Animals from each groups were slaughtered and no abnormality was found in the carcasses.

The experiment was not carried out for longer period for technical reasons and it has to be observed that the results and conclusions are based on only one experiment which in the opinion of the investigator is a pilot trial.

Experiment II

Thirty N.Z.W. rabbits of almost same weight and weaned at forty days were divided into six groups with five animals randomly allocated to each group. Each animal was housed in a separate cage. The groups received the following treatments:

- Group I - 100% Complete Rabbit Pellets (CRP)
- Group II - 80% CRP + Saccharum spp. (Ad lib)
- Group III - 60% CRP + Saccharum spp. (Ad lib)
- Group IV - 40% CRP + Saccharum spp. (Ad lib)
- Group V - 20% CRP + Saccharum spp. (Ad lib)
- Group VI - only Saccharum spp. (Ad lib)

The sugarcane fed was ground with an electrical humus chopper. Water was provided in semi-automatic drinkers. The experiment was carried out for eight weeks until the rabbits were 96 days old.

RESULTS AND DISCUSSION

TABLE III. - Liveweight (group average) and Daily Weight Gain

Group	I	II	III	IV	V	VI
INITIAL WEIGHT (g) at 40 days	640	636	650	645	642	635
DGW(g) for 1st	33.5	32.0	30.1	23.2	15.5	6.5
WEIGHT at 69 days (4 weeks)	1579	1532	1493	1295	1073	817
DGW(g) for 2nd 4 weeks	27.7	27.0	27.3	15.6	7.7	1.9
FINAL WEIGHT(g) 96 days	2354	2288	2257	1731	1296	870
DGW(g) for 8 weeks	30.6	29.5	27.7	19.4	11.6	4.2

Throughout the experiment the growth rates decreased with the decreasing percentage of CRP used. With each animal caged separately a randomised block design analysis using six treatments and five replicates was carried out.

There was no significant differences between Group I and Groups II and III. There were, however, significant differences at 5% level for 20 d.f. between Group I and Groups IV, V and VI.

The mean differences between the groups were as follows:

For Groups I and IV ... 11.2  
 For Groups I and V ... 19.0  
 For Groups I and VI ... 26.4

Table III shows that the group fed with pellets alone performed slightly better than that fed with sugar cane, ad lib, supplemented by 80% and 60% pellets. However, it can be assumed that sugar cane can be used to cut down the use of the complete rabbit pellets by 40%. Sugarcane may be used with 40% CRP to produce rabbits weighing 2500 g by around four and a half months. Sugar cane supplemented by pellets below 40% level would produce slow growth rate. Some rabbits in Group V showed signs of alopecia. Others, on sugar cane alone, started losing weight by the end of the experiment.

However, animals slaughtered from each group showed no abnormality in carcass quality except for those of Groups IV which were skinny and bony.

Experiment III

Forty-eight N.Z.W. rabbits of almost same weights and weaned at forty-two days were divided into six groups with eight animals randomly allocated to each group. Each animal was housed in a separate metallic cage. The first group received 100% complete rabbit pellets (CRP) while four groups were given *Leucaena leucocephala* (Mauritian Acacia) ad lib, supplemented by 80%, 60%, 40% and 20% CRP in respective groups. The last group was fed with only acacia. Water was provided in semi-automatic drinkers. The experiment was carried out for eight weeks until the rabbits were ninety-eight days old.

RESULTS AND DISCUSSIONS

TABLE IV. - Liveweights (group average) and Daily liveweight Gain

Group	I	II	III	IV	V	VI
INITIAL WEIGHT(g) at 42 days	703	682	692	685	699	687
DWG(g) for 1st 4 weeks	32.7	36.2	31.5	27.3	20.9	10.1
WEIGHT at 70 days	1620	1695	1574	1449	1285	770
DGW(g) for 2nd 4 weeks	25.4	20.9	22.6	22.7	13.4	8.9
FINAL WEIGHT(g) at 98 days	2330	2281	2207	2085	1661	1219
DWG(g) for 8 weeks	29.1	28.6	27.1	25.0	17.2	9.5

In the first month, the growth rate of rabbits fed on 80% CRP was the best followed by those fed on pellets alone. On the whole, the growth rates decreased with decreasing percentages of CRP used. With each animal caged separately it was possible to carry out a randomised block design analysis using six treatments and eight replicates.

There was no significant differences between Group I and Groups II and III. There were, however, significant differences at 5% level for 35 d.f. between Group I and Groups IV, V and VI.

The mean difference between the groups were as follows:

For Groups I and IV ... 4.06  
 For Groups I and V ... 11.88  
 For Groups I and VI ... 19.56

Table IV shows that the group fed with pellets alone performed slightly better than that fed with *Leucaena* spp., ad lib, supplemented by 80% and 60% CRP. However, it can be assumed that *Leucaena leucocephala* can be used to cut down the use of the complete rabbit pellets by 40%. The use of Mauritian acacia supplemented by 40% and 20% CRP would depress the growth by 14% and 40.9% respectively. Mauritian acacia may be used with 40% CRP by rabbit keepers who should then be expected to produce rabbits weighing 2500g by around 115th day and with 20% CRP the same weight can be obtained by around five months which is comparable to the present performance of rabbits at the Ministry of Agriculture and which is better than the performance of rabbits kept under village conditions.

No rabbits showed any signs of alopaecia or diarrhoea. There was also no death or mimosine toxicity symptoms as reported from works done on other animal species (5) and (6). Animals slughtered from each group showed no abnormality in carcase quality.

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