



# Growth Performance of Rabbits on Tree Leaves Included Complete Extruder Feed

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## ABSTRACT

An experiment was conducted in New Zealand White breed of rabbits to study the growth performance of rabbits on feeding tree fodder included complete extruder feed. Twenty four weaned New Zealand White breed of rabbits aged between six to seven weeks were randomized into 4 treatments with 6 replicates (one male and five females) in each. The treatments were extruder feed with *Desmanthus virgatus*, concentrate feed 85 parts with *desmanthus* 15 parts (T1), extruder feed with *Subabul* (*Leucaena leucocephala*) concentrate – 83 parts with 17 parts of *Subabul* (T2), extruder feed with *Kalyana Murungai* (*Erythrina indica*) concentrate – 75 parts with 25 parts of *Kalyana Murungai* (T3) and extruder feed with *Jack Fruit leaves* (*Artocarpus heterophyllus*) concentrate – 85 parts with 15 parts of *Jack Fruit leaves* (T4). The trial was conducted for ten weeks period. The overall average daily gain (ADG) observed in the treatment groups of T1, T2, T3 and T4 were 14.44 g, 12.51 g, 14.77g and 13.25g, respectively. The growth performance of rabbits on *Erythrina indica* tree fodder was found to be better than the leguminous green fodder *Desmanthus virgatus*. The *Leucaena leucocephala* and *Artocarpus heterophyllus* fed groups also showed a comparable growth performance. The feed conversion ratio in *Erythrina indica* fed group was lower than the *Desmanthus virgatus* group (4.27 vs. 4.59). The dry matter intake and feed conversion ratio in *Leucaena leucocephala* and *Artocarpus heterophyllus* fed groups seems to be found higher; on cost of production it was economical. This study reveals that the complete extruder feed with tree fodder can be effectively utilized as fodder source for broiler rabbits to reduce the production cost.

**Key words:** Broiler Rabbits, Tree Fodder, Extruder Complete Feed, Growth Performance.

## INTRODUCTION

Rabbits are an alternate meat producer in developing countries to meet increasing human demand for animal protein. As per All India 19th Livestock Census (2012) the rabbit population in India is 0.592 millions, 39.55 per cent increased compared to 2007 census. Rabbits are efficient converter of forage in to good quality animal protein compared to other livestock. In India, the landless rabbit farmers depends on vegetable waste and tree fodders for rearing rabbits as backyard venture to meet their family protein demand. Commercial rabbit farms are scanty and feeding their rabbit with leguminous fodder like *Desmanthus virgatus* to obtain market weight of 2 kg at 12 weeks. Rabbits possesses peculiar characteristic, the caecotrophy makes the animal to utilize high forage diet efficiently (up to 20 % fibre in their ration). Moreover, the caecal microflora aids in digesting the fibrous component in feed. The tree leaves are being fed separately as green fodder for rabbits. The trials on extruder feed with tree leaves are not available at present in India. Hence, the present study was carried out to assess the growth performance of rabbits on complete extruder feed incorporated with tree leaves.

## MATERIAL AND METHODS

The experiment was conducted at Rabbit Breeding Unit of Post Graduate Research Institute in Animal Sciences, Tamil Nadu Veterinary and Animal Sciences University (TANUVAS), Kattupakkam, Tamil Nadu. The rabbits were maintained in cage system of rearing. The male and females were housed in individual Galvanized iron cages with the dimension of 2 feet × 1.5 feet × 1.5 feet kept above 3 feet from the ground level. The side walls were constructed up to 1 feet height and above that 1 inch weld mesh was placed. Fresh air was circulated in the rabbit house by using exhaust

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fans. Before kindling, the nest boxes were provided for the pregnant does. After kindling, nest boxes were checked every day for any dead young ones. The weaning was practiced on 42nd day. A complete extruded rabbit feed was prepared using tree leaf meals at different levels with concentrate in order to make the diet Iso nitrogenous. Twenty Four weaned New Zealand White breed of rabbits aged between six to seven weeks were randomized into 4 Treatment groups with 6 replicates (one male and five females) in each treatment and the trial was conducted for 10 weeks. The Treatment groups were (T1) extruder feed with *Desmanthus virgatus* diet (85 parts concentrate (rabbit) feed with 15 parts of desmanthus – 15 parts, (T2) extruder feed with Subabul (*Leucaena leucocephala*) [83 parts concentrate (rabbit) feed with 17 parts of Subabul, (T3) extruder feed with Kalyana Murungai (*Erythrina indica*) [75 parts concentrate (rabbit) feed with 25 parts of *Erythrina indica*] and (T4) extruder feed with Jack Fruit leaves (*Artocarpus heterophyllus*) [85 parts concentrate (rabbit) feed with 15 parts of jack Fruit leaves]. The extruder complete feed is being offered in the morning and the left over is being removed and weighed in the next day morning. Clean portable water was supplied for drinking and the water availability was ensured all the time.

At weekly intervals body weight and daily feed offered, left over and feed consumed were recorded in order to assess the feeding value of extruded complete feed with tree leaves on rabbits. The data collected on various parameters were statistically analyzed as per the method of Snedecor and Cochran (1989) and Duncan (1955).

## RESULTS AND DISCUSSION

The proximate principles of tree leaves and *Desmanthus virgatus* showed that the crude protein content was higher in tree leaves of *Leucaena leucocephala* (Subabul) and *Erythrina indica*. The Jack fruit leaves have lower crude protein content (7.43 per cent).

The extruder feed prepared using *Erythrina indica* showed better performance than *Desmanthus virgatus*. The extruder feed with jack fruit leaves showed poor performance compared to all the treatment groups. The decreased in performance observed in the first biweekly might be due to the poor in adoptability observed to extruder feed. The increased feed consumption and poor feed conversion efficiency of Jack fruit leaves might be due to thick cuticle of jack fruit leaves.

**Table 1.** Proximate principles in tree fodder

Sl. No.	Proximate Principles	<i>Desmanthus virgatus</i> (Hedge Lucerne)	<i>Leucaena leucocephala</i> (Subabul)	<i>Erythrina indica</i> (Kalyana Murungai)	<i>Artocarpus heterophyllus</i> (Jack fruit)
1	Crude Protein (%)	20.28±0.39	21.40±0.13	26.24±0.58	7.43±0.28
2	Crude Fibre (%)	8.21±0.17	10.01±0.67	6.51±0.39	17.78±0.59
3	Ether Extract (%)	7.52±0.52	7.52±0.36	5.59±0.71	3.36±0.63
4	Total Ash (%)	8.20±0.31	8.80±0.21	9.19±0.30	17.70±0.21

Each value is the mean of three observations

**Table 2.** Body weight (g), gain in weight (g) and average daily gain (g) of rabbits fed complete extruder feed

Group	Extruded complete feed with <i>Desmanthus virgatus</i>	Extruded complete feed with <i>Leucaena leucocephala</i>	Extruded complete feed with <i>Erythrina indica</i>	Extruded complete feed with <i>Artocarpus heterophyllus</i>
Initial body weight (42 <sup>nd</sup> day)	628±17	625±14	625±13	624±14
Final body weight (112 <sup>th</sup> day)	1639 <sup>a</sup> ±11	1501 <sup>b</sup> ±13	1659 <sup>a</sup> ±12	1552 <sup>c</sup> ±22
<b>Biweekly weight gain (g)</b>				
First bi-weekly	242.33 <sup>d</sup> ±3.82	177.16 <sup>b</sup> ±1.30	222.17 <sup>c</sup> ±1.25	166.33 <sup>a</sup> ±0.80
Second bi-weekly	211.67 <sup>d</sup> ±2.28	184.83 <sup>b</sup> ±2.54	228.17 <sup>c</sup> ±2.15	176.67 <sup>a</sup> ±2.54
Third bi-weekly	198.50 <sup>d</sup> ±2.81	182.83 <sup>b</sup> ±4.68	211.67 <sup>c</sup> ±1.89	161.83 <sup>a</sup> ±1.58
Fourth bi-weekly	182.33 <sup>d</sup> ±2.17	164.50 <sup>b</sup> ±3.22	195.33 <sup>c</sup> ±1.31	150.50 <sup>a</sup> ±2.01
Fifth bi-weekly	176.50 <sup>b</sup> ±14.26	166.17 <sup>b</sup> ±9.47	177.00 <sup>b</sup> ±7.78	128.12 <sup>a</sup> ±8.80
<b>Average Daily Gain (g)</b>				
First bi-weekly	17.31 <sup>d</sup> ±0.27	12.65 <sup>b</sup> ±0.09	15.87 <sup>c</sup> ±0.08	11.88 <sup>a</sup> ±0.06
Second bi-weekly	15.12 <sup>c</sup> ±0.16	13.20 <sup>b</sup> ±0.18	16.29 <sup>d</sup> ±0.15	12.62 <sup>a</sup> ±0.18
Third bi-weekly	14.18 <sup>c</sup> ±0.20	13.06 <sup>b</sup> ±0.33	15.12 <sup>d</sup> ±0.14	11.56 <sup>a</sup> ±0.11
Fourth bi-weekly	13.02 <sup>c</sup> ±0.16	11.75 <sup>b</sup> ±0.23	13.95 <sup>d</sup> ±0.09	10.75 <sup>a</sup> ±0.14
Fifth bi-weekly	12.61 <sup>b</sup> ±1.02	11.86 <sup>b</sup> ±0.68	12.64 <sup>b</sup> ±0.56	9.14 <sup>a</sup> ±0.63

Each value is the mean of six observations

Mean bearing at least one common superscript within a row do not differ significantly (P<0.05)

**Table 3.** Dry Matter Intake (g) and Feed Conversion Ratio of rabbits fed complete extruder feed

Group	Extruded complete feed with <i>Desmanthus virgatus</i>	Extruded complete feed with <i>Leucaena leucocephala</i>	Extruded complete feed with <i>Erythrina indica</i>	Extruded complete feed with <i>Artocarpus heterophyllus</i>
<b>Dry Matter Intake (g)</b>				
First bi-weekly	45.01±1.03	43.43±0.84	43.81±1.07	45.17±1.06
Second bi-weekly	59.21 <sup>b</sup> ±0.73	55.00 <sup>a</sup> ±1.06	57.98 <sup>ab</sup> ±0.78	57.17 <sup>ab</sup> ±1.35
Third bi-weekly	70.91 <sup>b</sup> ±1.09	66.50 <sup>a</sup> ±0.99	70.83 <sup>b</sup> ±0.70	65.00 <sup>a</sup> ±1.06
Fourth bi-weekly	82.75 <sup>b</sup> ±0.93	76.50 <sup>a</sup> ±1.33	83.17 <sup>b</sup> ±1.05	74.17 <sup>a</sup> ±1.30
Fifth bi-weekly	91.12 <sup>bc</sup> ±1.24	81.15 <sup>b</sup> ±1.03	95.35 <sup>c</sup> ±0.71	81.17 <sup>a</sup> ±3.17
<b>Feed Conversion Efficiency</b>				
First bi-weekly	2.61 <sup>a</sup> ±0.09	3.43 <sup>b</sup> ±0.07	2.76 <sup>a</sup> ±0.08	3.80 <sup>c</sup> ±0.08
Second bi-weekly	3.92 <sup>b</sup> ±0.02	4.17 <sup>c</sup> ±0.07	3.56 <sup>a</sup> ±0.03	4.53 <sup>d</sup> ±0.11
Third bi-weekly	5.01 <sup>b</sup> ±0.09	5.10 <sup>b</sup> ±0.07	4.68 <sup>a</sup> ±0.08	5.62 <sup>c</sup> ±0.13
Fourth bi-weekly	6.35 <sup>b</sup> ±0.09	6.52 <sup>b</sup> ±1.00	5.96 <sup>a</sup> ±0.09	6.89 <sup>c</sup> ±0.08
Fifth bi-weekly	7.45 <sup>a</sup> ±0.54	7.50 <sup>a</sup> ±0.56	7.61 <sup>a</sup> ±0.31	8.99 <sup>b</sup> ±0.36

Each value is the mean of six observations

Mean bearing at least one common superscript within a row do not differ significantly (P<0.05)

The *Leucaena leucocephala* included in the present study is lower than the level recommended (24 to 40 %) by Adejumo (2006) and Nieves et al. (2002). In contrast, Tangendjaja et al. (1990) reported that the feeding of *Leucaena leucocephala* meals should be avoided in rabbits because of poor performance. Mtenga et al. (1994) and Parigi-Bini et al. (1984) recommended 30 % level of dried leaves in rabbit ration. The study on feeding *Erythrina indica* is not available in rabbits. The increased dry matter consumption observed in *Artocarpus heterophyllus* feeding coincides with the earlier report of Brenda Keir et al. (1997) in goats.

## CONCLUSIONS

Overall 10 weeks study revealed that the tree fodder included complete extruder feed could be fed to rabbits to reduce the cost of production. The *Leucaena leucocephala* can be included up to 50 per cent level in rabbit grower ration. *Erythrina indica* is preferable tree fodder in rabbit because of the production is better than the leguminous fodder *Desmanthus virgatus*.

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