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Economics of soviet chinchilla rabbits under different feeding regimes

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Abstract

The study was conducted to assess the performance of Soviet Chinchilla rabbits under different feeding regimes at Livestock Farm Complex, Madhavaram milk colony, Chennai-51. A total number of thirty Soviet Chinchilla weaned bunnies were divided into three groups viz T₁: (Concentrate diet + Guinea grass), T₂: (Concentrate diet + Hydroponic maize) and T₃: (Concentrate diet + Hydroponic cowpea). All the animals were reared in cages under similar management conditions. Data on microclimatic variables, body weight, average daily body weight gain, average dry matter intake, feed conversion ratio, cost of fodder production, cost of rabbit production/kg live weight gain, were collected. Rabbits under T₂ had numerically higher body weight than T₁ and T₃. The overall weight gain (g) in T₁, T₂ and T₃ were 1333.10±54.84, 1673.80±83.82 and 1390.60±62.95, respectively. The rabbit fed hydroponic maize had significantly higher body weight gain than those were fed with hydroponic cowpea and guinea grass. The overall feed conversion ratio in T₁, T₂ and T₃ were 9.64, 6.12 and 5.97 where better feed conversion ratio was observed in hydroponic fodder fed groups (T₂ and T₃). The total cost incurred towards feeding of rabbits during the experimental period was least in T₁(Rs. 151.05) followed by T₂ (Rs.208.03) and T₃ (Rs.457.34). Hydroponic fodder is a land-saving nutritious alternative to green fodder for rabbits.

Keywords: Soviet Chinchilla rabbits, Hydroponic fodder, Guinea grass, Economics

1. Introduction

The domestic rabbit (*Oryctolagus cuniculus*) is a promising micro-livestock species that can play a role in improving the livelihood and nutritional security of poor and marginal farmers. Rabbits have, probably, the highest meat production capacity among domestic animals. Protein of high biological value, low fat and higher vitamin and mineral content make rabbit meat one of the important constituents of a healthy human diet. The new generation is more aware of health concerns raised by the medical fraternity about red meat consumption. In search of an alternative meat, rabbit meat can reliably address health and nutritional issues. Shorter age at maturity, short generation interval, higher prolificacy (30-50 kits/doe/yr), higher meat yield per rabbit per year, feed conversion efficiency (3.46 to 4.80) and unique meat quality are some of the virtues of the meat rabbit. However, like all animal farming, rabbitry is also considered a subsidiary sector of agriculture. The dependence of rabbits exclusively on crop residues may be suitable only for backyard rabbitries but not for commercial rabbitries. Newer rabbit strains, suitable fodder, value addition of meat and other products and marketing and export opportunities are needed to leap forward in meat rabbitry (Pandian al.,2026) [5]. To optimize the fodder production for rabbits, hydroponic cultivation is an ecofriendly method of growing fodder and hydroponic grown cereals grow up to 50% more and produce higher yields of better-quality fodder (Kide *et al.*, 2015) [3]. The present study will help to understand the benefits of hydroponic fodder and growth performance of Soviet Chinchilla rabbits. Hence the present study was undertaken to assess the performance of Soviet Chinchilla rabbits under different feeding regimes.

Materials and Methods

Productivity of Hydroponic Cowpea Fodder

The cowpea seeds before soaking and hydroponic cowpea fodder harvested after 6 days of growth were weighed using electronic weighing balance. Productivity of hydroponic cowpea

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fodder was calculated using the formula

$$\text{Productivity / kg of seed} = \frac{\text{Total hydroponic cow pea fodder yield (kg)}}{\text{Total quantity of seed (kg)}}$$

Analysis of nutritional composition such as dry matter (DM), crude protein (CP), crude fibre (CF), ether extract (EE), total ash (TA), nitrogen free extract (NFE), of concentrate feed, Guinea grass, hydroponic maize fodder and hydroponic

cowpea fodder were carried out as per AOAC (2005).

Cost of Fodder Production

Cost of production / kg green fodder (Rs.) was calculated using the formula given below.



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$$\text{Cost of production / kg hydroponic fodder (Rs.)} = \frac{\text{Cost of seed/kg}}{\text{Fodder production / kg of seed (kg)}}$$

Cost of Rabbit Production

Cost of production / kg live weight gain (Rs.) was calculated

using the formula given below.

$$\frac{\text{Cost of production / kg live weight gain (Rs.)}}{\text{live weight gain (Rs.)}} = \frac{\text{Cost of feeding during the period (Rs.)}}{\text{Total body weight gains during the period (kg)}}$$

The cost of feeding per animal per day for each treatment group was calculated using the formula given below and

compared.

$$\text{Cost of feeding per animal per day (Rs.)} = \frac{\text{Total cost of feeding per animal}}{\text{Total number of days}}$$

The data collected were analysed by the statistical methods suggested by Snedecor and Cochran (1994) [6].

Results and Discussion

Proximate analysis of forages and concentrate feeds for rabbits under treatments groups were presented Table 2. In the present study, guinea grass had lower moisture and higher dry matter content compared to hydroponic forages. Among the hydroponic forages hydroponic maize had lower moisture and higher dry matter content which are similar to the findings of Jemimahet *et al.* (2018) [2]. The crude protein content was highest in hydroponic cowpea (35.86%) followed by land grown guinea grass (14.92%) and hydroponic maize (10.93%). The higher crude protein in fodder cowpea might be due to leguminous type than other fodders. Crude protein content of guinea grass was higher than maize. This might be due to fertilization of land with poultry manure. The crude protein content of hydroponic cowpea is higher than land grown fodder cowpea (Matondi *et al.*, 2015) [4]. Crude fibre

was higher in land grown guinea grass compared to hydroponic fodder (26.36%). Nitrogen Free Extract (NFE) was highest in hydroponic maize (72.71%) compared to guinea grass and hydroponic fodder cowpea might be due to its cereal variety.

Feed Conversion Ratio

Overall Feed conversion ratio of rabbit in different treatment groups T₁, T₂ and T₃ were 9.64±0.49, 6.12±0.30 and 5.97±0.26, respectively. The feed conversion ratio had highly significant difference in 6-8, 12-14 and 16-18 weeks of age; significant difference in 10-12 and 14-16 weeks of age and no significant difference in 8-10, 18-20, 20-22 and 22- 24 weeks of age. FCR was observed to be lower in T₃ followed by T₂ and T₁. The results of FCR in the present study were comparable with the findings of (Abdullahi *et al.*, 2021 and Suarni *et al.*, 2021) [1, 7]. The better FCR in T₃ might be contributed by lower dry matter intake per unit weight gain.

Table 1: Feed ingredients composition of the concentrate mixture fed to rabbits

Feed ingredients	Guinea grass T ₁	Hydroponic maize T ₂	Hydroponic cowpea T ₃
Maize grain	25	25	27
Brokenrice	21.47	21.47	21.47
Bajra grain	10	10	15
Deoiled rice bran	15	15	25
Soya bean meal	22	22	10
Sunflower meal	5	5	0
Mineral mixture	1	1	1
Methionine	0.28	0.28	0.28
Salt	0.25	0.25	0.25
Total	100	100	100

Table 2: Proximate composition (% on DM basis) of green forages and concentrate mixture fed to rabbits

Parameters	Green forages			Concentrate mixture		
	Guinea grass	Hydroponic maize	Hydroponic cowpea	Guinea grass	Hydroponic maize	Hydroponic cowpea
	T ₁	T ₂	T ₃	T ₁	T ₂	T ₃
Moisture	78.06	82.27	89.24	9.58	9.58	10.55
Dry matter	21.94	17.73	10.76	90.42	90.42	89.45
Crude protein	14.92	10.93	35.86	20.74	20.74	16.43
Ether extract	3.51	4.38	2.34	2.8	2.8	3.02
Ash	11.89	2.98	7.14	6.16	6.16	5.89
Crude fibre	26.36	9	12.99	4.04	4.04	5.12
Nitrogen free extract	43.32	72.71	41.67	66.26	66.26	69.54

Details such as the cost of seed (Rs), fodder produced (Kg) per kg of seed, cost of production per kg of fodder (Rs), total cost incurred towards feeding of rabbits during experimental period (Rs) and cost of production per kg live weight are given in Table 19. The cost of production of guinea grass fodder was the least (Rs 0.30) followed by hydroponic maize (Rs 3.30) and high for hydroponic cow pea production (Rs 33.33). The total cost incurred towards feeding each rabbit during the experiment period was least in T₁ (Rs 151.05) followed by T₂ (208.03) and T₃ (457.34). Similarly cost of production per kg live weight in T₁, T₂ and T₃ were Rs 113.57, 124.57 and 329.02 respectively.

Economics

Details such as the cost of seed (Rs), fodder produced (kg) per kg of seed, cost of production per kg of fodder (Rs), total cost

incurred towards feeding of rabbits during experimental period (Rs) and cost of production per kg live weight are given in Table 3. The cost of production of guinea grass fodder was the least (Rs 0.30) followed by hydroponic maize (Rs 3.30) and high for hydroponic cow pea production (Rs 33.33). The total cost incurred towards feeding each rabbit during the experiment period was least in T₁ (Rs 151.05) followed by T₂ (208.03) and T₃ (457.34). Similarly cost of production per kg live weight in T₁, T₂ and T₃ were Rs 113.57, 124.57 and 329.02 respectively. The cost of production for hydroponic maize fodder in the present study was higher than that reported by Jemimahet *et al.* (2018) [2] and cost of feeding / animal /30 days (35.25 + 0.39 INR) than other two treatment groups. Hence, hydroponic maize fodder can be used as an alternate for concentrate mixture in the diet of rabbit kits.

Table 3: Economics of Feeding Guinea grass(T₁), Hydroponic Maize (T₂) and Hydroponic Cowpea(T₃)

S. No	Parameters	T ₁	T ₂	T ₃
1	Cost of seed/kg (Rs.)	900	20	200
2	Fodder produced(kg)/kg of seed	30,000	6	6.25
3	Cost of production /kg of fodder (Rs.)	0.3	3.33	33.33
4	Total quantity of fodder fed from 6 weeks to 22 weeks(kgs)	28.18	23.17	8.95
5	Total cost incurred towards feeding fodder (Rs.)	8.45	77.23	298.34
6	Total quantity of Concentrate fed from 6 weeks to 22 weeks(kgs)	7.13	6.54	7.95
7	Cost incurred towards feeding concentrate @ Rs.20/kg	142.6	130.8	159
8	Total cost incurred towards feeding (Rs.)	151.05	208.03	457.34
9	Body weight gain	1.33	1.67	1.39
10	Cost of production/kg live weight	113.57	124.57	329.02

Conclusion

The cost of rabbit production under hydroponic fodder is higher compared to conventional feeding of land grown fodder. Hydrophonic fodder can be alternative where land and water are limited for rabbit production. Wherever land is available, conventional fodder production is economical and where land is a major constraint and sale price of rabbit meat is high, hydroponic fodder production shall be favorably considered.

Conflict of Interest

Not available.

Financial Support

Not available.

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