

GROWTH PERFORMANCE OF BROILER RABBITS MAINTAINED ON DIFFERENT DIETS

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ABSTRACT : A study on growth performance on 90 broiler rabbits of White Giant and Soviet Chinchilla, weaned a 28 days and maintained on 3 different diets for 56 days, was conducted with an objective to work out an economical feeding system. First group (T1) was provided concentrate pellets and cowpea hay (*Vigna sinensis*) plus green alfalfa, second group (T2) *ad libitum* complete pelleted feed and third group (T3) was provided *ad libitum* concentrate pellet alongwith green alfalfa fodder. Dry matter intake in T3 was (139g/d) significantly ($P<0.01$) higher than that of T1 (106g/d)

and T2 (97 g/d), the latter two, however did not differ significantly from each other. The average daily gain in T2 (30 g/d) and T3 (29 g/d) were significantly higher than in T1 (24 g/d). The highest net return per rabbit was recorded in T2 (Rs 9.87) followed by T3 (Rs 6.21) compared to T1 (Rs - 2.88). The results tend to conclude that the economical weight gain of about 30g/d under tropical conditions can be achieved in exotic farm bred broiler rabbits maintained either on complete pelleted feed or concentrate pellets supplemented with good quality green alfalfa, fed *ad libitum*.

RÉSUMÉ : Performances de croissance de lapins de chair nourris à différents régimes.

Les performances de croissance de 90 lapins de chair Géant Blanc et Chinchilla Soviétique ont été étudiées dans le but de mettre au point une méthode d'alimentation économique. Les animaux sevrés à 28 jours ont reçu trois régimes différents : Le premier (T1) est constitué de concentré granulé et de foin de dolique (*Vigna sinensis*) + de la luzerne verte, le second (T2) de granulé complet distribué *ad libitum* et le troisième (T3) de granulé concentré distribué *ad libitum* en même temps que de la luzerne verte. La matière sèche ingérée dans le groupe T3 (139g/l) est significativement plus élevée ($P<0.01$) que dans les groupes T1 (106g/l) et T2 (97g/l), ces

derniers cependant ne se différencient pas significativement entre eux. Le gain moyen quotidien du groupe T2 (30g/l) et du groupe T3 (29g/l) est significativement plus élevé que celui de T1 (24g/l). Le bénéfice net par lapin le plus élevé a été enregistré dans le groupe T2 (9.87 Rs) suivi de T3 (6.21 Rs) en comparaison avec le groupe T1 (-2.88 Rs). De ces résultats on peut conclure qu'un gain de poids journalier d'environ 30g/l, économiquement convenable dans des conditions tropicales, peut être obtenu dans des élevages utilisant des lapins de chair de race exotique aussi bien avec uniquement de l'aliment granulé complet qu'avec un aliment concentré supplémenté avec de la luzerne verte de bonne qualité distribuée *ad libitum*.

INTRODUCTION

The twelve weeks weight is considered to be an important economic parameter in broiler rabbit production. The feeding methods to the rabbit in India are not yet fully standardized. Feeding of concentrate pellets together with green fodder or some other roughage source is generally practised (SAHU and PRASAD, 1990). Feeding of complete pelleted diet is the usual practice in other countries which is desirable and economical (HARRIS *et al.*, 1984 ; LEBAS *et al.*, 1984). The aim of the present study was to work out an economical feeding system for broiler rabbit production under three different feeding regimes from weaning (28 days) to slaughter age (84 days). Besides this, the carcass weight as well as cost of feeding and financial returns were also worked out.

MATERIALS AND METHODS

A feedlot trial was conducted for 56 days from 28 to 84 days of age on 90 broiler young rabbits of both sexes belonging to White Giant and Soviet Chinchilla breeds. The young were weaned at 28 days of age. The animals were randomly allotted to three groups of 30 animals each, as and when they were weaned from their mothers. During the experimental period from

December 1992 to February 1993 the animals were housed individually in iron cages of 18" x 20" x 15" dimension fitted with feeders and watering bowls.

The first group of rabbits (T1) was fed on concentrate pellets available in the market and fodder (mixture of cowpea hay and green alfalfa in approximately equal quantity by weight)

The quantity of concentrate pellets offered varied from 30 to 80g as the young grew, while the fodder offered varied from 80 to 200g/head/day. The animals of second group (T2) were maintained on complete pelleted feed fed *ad libitum*. For the preparation of complete feed pellets, all the feed ingredients were ground and mixed manually after addition of 10kg of water containing 2kg molasses for 25kg of feed. The feed mix so prepared was passed through experimental pelleting machine and the moist pellets were sun-dried before storing in gunny bags. The animals of the third group (T3) were offered concentrate pellets as in T1 and green alfalfa fodder *ad libitum*. The physical and chemical composition of diets is presented in Table 1. Feeding of animals was done one in morning hours and the refusal was recorded next day before offering the fresh feed.

Body weights were recorded weekly. At the end of feeding period of 12 weeks of age, five animals from each group were slaughtered for assessment of

Table 1 : Composition of diets and fodder fed to different group of broiler rabbits.

	Concentrate pellets	Complete pellets	Cowpea hay* + alfalfa	Alfalfa
<i>Ingredients</i>				
Maize	40	-		
Barley	-	35		
Wheat bran	15	13		
Groundnut cake	30	22		
Ground cowpea hay	-	15		
Fish meal	5	5		
Molasses	8	8	57%	79.8%
Mineral mixture	1.5	1.5		
Salt	0.5	0.5		
<i>Chemical composition (% DM)</i>				
Moisture	10.2	7.8	44	76
Crude protein	19.5	18.2	7.5	13.2
Ether extract	3.1	2.9	0.8	1.4
Crude fibre	7.0	11.5	10.7	34.6
Ash	10.1	12.3	7.9	13.9
Calculated DCP	15.0	13.5	6.5	11.4
Calculated DE (KCal/kg DM)	2950	2780	1146	2000

* Cowpea hay and green alfalfa were mixed in equal quantity by weight.

dressing percentage of live weight basis. Feed conversion ratio was calculated as feed (dry matter) consumed/kg body weight gain. The analysis of feed and fodder was done by standard method (AOAC, 1980). Data on voluntary feed intake, live weight gain and feed conversion were analyzed using Randomised Block Design. Individual treatment means were compared using Duncan's Multiple Range Test (STEEL

and TORRIE, 1980).

RESULTS AND DISCUSSION

The initial body weight of young was 0.42kg in all groups. The weight at 12 weeks of age was significantly ($P<0.01$) higher in T2 and T3 (2.07 and 2.05 kg) compared to T1 (1.77 kg). Similarly, the total

Table 2 : Growth performance of broiler rabbits maintained on different diets.

Traits	T1	T2	T3
	Concentrate pellets + cowpea + alfalfa	Complete pellets	Concentrate pellets + alfalfa
Number of animals	30	30	30
Initial body weight (4 weeks weight) (kg)	0.42	0.43	0.42
Twelve weeks weight (kg)	1.77 ^a	2.07 ^b	2.05 ^b
Total weight gain (kg)	1.35 ^a	1.65 ^b	1.63 ^b
Average daily gain (g)	24.12 ^a	29.66 ^b	29.16 ^b
Concentrate intake (kg)	2.77	5.84	1.71
Fodder intake (kg)	6.04	-	25.84
Dry matter intake through concentrate (kg)	42% 2.54	5.43	20 21.57
Dry matter intake through fodder (kg)	57% 3.39	-	79.8 6.19
Total dry matter intake	5.93 ^a	5.43 ^a	7.77 ^b
Dry matter intake (g/day)	106.0 ^a	97.0 ^a	138.8 ^b
Dry matter intake (% of body weight)	9.73 ^b	7.75 ^a	11.30 ^c
Dry matter intake (g/kg W ^{0.75})	98.5 ^b	81.9 ^a	119.3 ^c
Feed conversion ratio (on DM basis)	4.43 ^b	3.29 ^a	4.80 ^c
Feed efficiency %	22.80 ^a	30.62 ^b	21.03 ^a

Values bearing different superscripts in a row differ significantly ($P<0.01$) from each other.

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"Growth performance of broiler rabbits maintained on different diets" by PRASAD R., SINGH G., PATNAYAK B.C.

The first lines of Table 3 must be changed as follows :

Table 3 : Economics of broiler rabbits maintained on different diets (per broiler).

	Concentrate pellets + cowpea + alfalfa	Complete pellets	Concentrate pellets + Alfalfa
<i>Cost of young rabbit at 28 days (Rs)</i>	15	15	15
Cost of concentrate (Rs) @ Rs 545/qrtl (concentrate pellet) ; @ Rs 350/qrtl (complete pellet)	15.09	20.44	9.31
Cost of fodder (Rs) @Rs 250/qrtl of leguminous hay	8.47	-	15.47
<i>Total feed cost (Rs)</i>	23.56	20.44	24.78
<i>Labour cost * (Rs) @ Rs 22/day</i>	6.22	6.22	6.22
Total cost incurred (Rs)	44.78	41.66	46.00

Figure 1 and 2 :

◻ conc. + cowpea + alfalfa + complete pellets ♦ conc. + alfalfa

Table 3 : Economics of broiler rabbits maintained on different diets (per broiler).

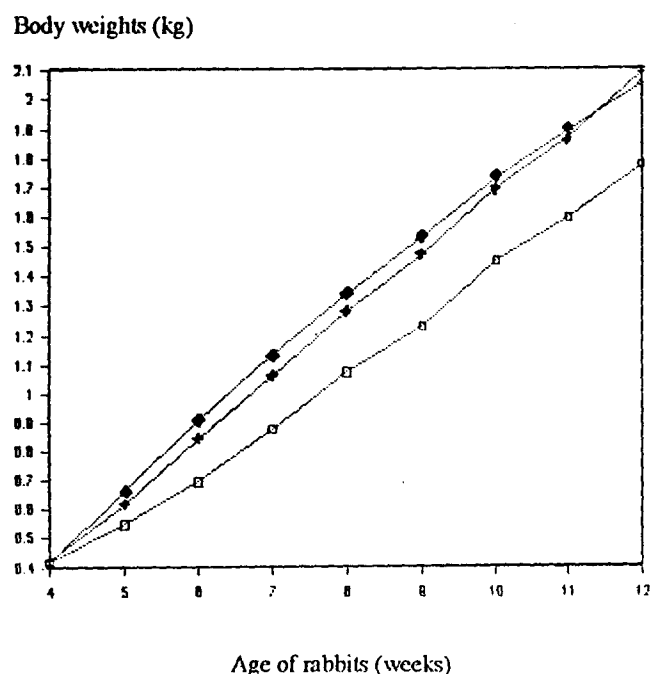
	Concentrate pellets + cowpea + alfalfa	Complete pellets	Concentrate pellets + Alfalfa
Cost of young rabbit at 28 days (Rs)	15	15	15
Cost of concentrate (Rs) @ Rs 545/qlt (concentrate pellet) ; @ Rs 350/qlt (complete pellet)	16.09	20.44	9.31
Cost of fodder (Rs) @Rs 250/qlt of leguminous hay	23.56	20.44	24.78
Total feed cost (Rs)			
Labour cost * (Rs) @ Rs 22/day	6.22	6.22	6.22
Total cost incurred (Rs)	44.46	41.66	46.00
Weight at 12 weeks (kg)	1.77	2.08	2.08
Dressing percentage (live weight basis)	40.10	44.40	45.81
Meat available per rabbit (kg)	0.709	0.923	0.938
Value of meat @ Rs 45/kg	31.90	41.53	42.21
Value of pelt @ Rs 10/pelt	10	10	10
Total income (Rs)	41.90	51.53	52.21
Net return/head (Rs)	-2.88	9.87	6.21
Net return/100 animals in 56 days (Rs)	-288	987	621
Net return/100 animals/month (Rs)	-154.28	528.22	332.68

* Assumption was made that one labour can look after 200 rabbits ; Rs : Indian Rupees.

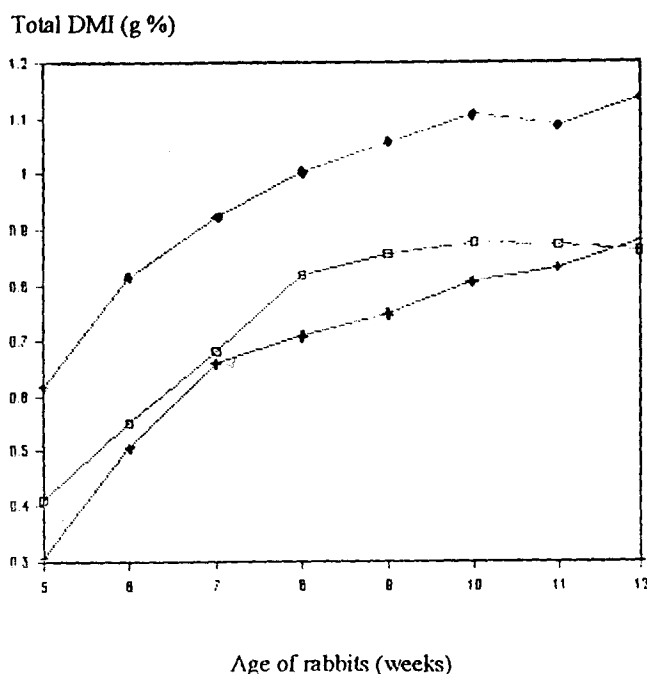
weight gain and average daily gain (ADG) were also observed to be significantly ($P < 0.01$) higher in T2 and T3 (1.65kg, 29.66g and 1.63kg, 29.16g respectively) compared to T1 (1.35kg, 24.12g). There was a linear increase in body weights with advancing age in all the three groups (Fig. 1). The ADG obtained in T2 and T3 diets are comparable to the gains required for

commercial broiler production (JOYCE *et al.*, 1971).

The total dry matter intake through concentrate and fodder was markedly ($P < 0.01$) higher in T3 than in T1 and T2 because of higher dry matter intake through alfalfa. Within the group T3 dry matter intake from alfalfa was higher than from concentrate pellet which indicated that green alfalfa is more palatable to rabbits compared to concentrate. HARRIS *et al.* (1983) also

Figure 1 : Weekly change in body weights (kg).

□ conc. + fodder, ○ complete pellets, ♦ conc. + alfalfa.

Figure 2 : Weekly change in total D M intake (g)

□ conc. + fodder, ○ complete pellets, ♦ conc. + alfalfa.

reported similar observations regarding the feed intake. Dry matter intake when expressed on per cent of body weight as well as on metabolic body size, was lowest in T2 (7.75% and 81.85g/kg $W^{0.75}$) which may be due to the availability of required nutrients in condensed form compared to T1 or T3 (9.73, 11.30% and 98.53, 119.25g/kg $W^{0.75}$). Although the dry matter intake as per cent of live weight or per kg metabolic weight was higher in T1, the growth was less due to less energy density of diet (LEBAS *et al.*, 1982). In T3, however, the growth was similar to that in T2 because of very high dry matter intake due to higher palatability of alfalfa.

Total feed intake during the trial period of 56 days was almost the same in T1 and T2 (5.93 and 5.43kg) but the final body weight at 84 days and total gain were significantly ($P < 0.01$) higher in T2 (Table 2) due to better feed efficiency on complete pellet diet. This could be attributed to lower quantity of dry fodder in T2 (15%) than in T1 in which dry fodder constituted about 57% of total dry matter intake leading to poor supply of nutrients to growing rabbits. In contrast to this total dry matter intake was significantly ($P < 0.01$) high in T3, *i.e.* 7.77kg compared to T2; *i.e.* 5.43kg (Fig. 2) but final body weight and total weight gain did not differ from each other, because in T3 alfalfa constituted about 80% of the total dry matter.

The feed conversion ratio (feed intake/kg gain) was lowest (3.29) in T2 and was more in T1 (4.34) and T3 (4.80) because of variations in energy densities of the rations (POTE *et al.*; 1980). Complete pelleted ration supported the highest weight gain because of the availability of all required nutrients in balanced proportion.

Economic aspects : A balance of expenditure incurred and return obtained was calculated keeping in view the prevailing market prices of different commodities. All data are presented in local currency, *i.e.* Indian Rupees (Rs). A total amount of Rs. 44.76, 41.66 and 46.00 was incurred in rearing on broiler rabbit up to the age of 84 days in T1, T2 and T3 respectively (Table 3). The rearing cost includes the cost of young at 4 week age, feeding cost and labour cost. As presented in Table 3, the dressing percentage on live weight basis was 40.10, 44.40 and 45.81% in T1, T2 and T3 groups respectively. Because of higher dressing percentage and greater live weight at 12 weeks of age the meat available from each rabbit was higher in T2 and T3 (0.923 and 0.938kg) compared to T1 (0.706kg). The net return was highest in T2 (Rs. 9.87) compared to T1 and T3 (Rs. -2.88 and 6.21) owing to lesser feeding cost in T2 during feeding period. The net return per 100 animals per month basis was Rs. 528.22 in T2 and Rs. 338.68 in T3 while there was loss in T1. The values of profit and loss are subject

to variation in market prices of feed, labour cost and meat prices etc. The results point out that the economic viability of broiler rabbit production on complete pelleted feed followed by concentrate pellets plus green alfalfa is more profitable than feeding limited quantity of pellets with cowpea hay and green alfalfa.

From the results of the experiment it can be concluded that a good growth rate of 30g/day can be achieved in broiler rabbits either on complete pelleted feed or concentrate pellets plus green alfalfa fed *ad libitum*, which in turn will lead to financial benefit to rabbit rearers under tropical conditions.

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