

## Effect of Maternal Nutrition on Kits During Pre and Post Partum Period

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**Abstract:** A total of 15 young rabbits (kits) of 35 days old were randomly allocated to same concentrate mixture (T<sub>2</sub>) in a completely randomized design. All the rabbits were offered ad-libitum green grass with same concentrate mixture. All the animals were kept in the same management. The feed intake, live weight changes and feed conversion efficiency was recorded. DM intake in three different groups (A, B, C) were 350.53 ± 46.57, 403.62 ± 41.89 and 389.30 ± 53.71 (g/wk) which were not significant. The average daily gains in group A, B and C were 11.25 ± 8.71, 15.20 ± 8.33 and 14.43 ± 9.84 respectively and the differences among groups were not significant. The differences in growth velocity among different groups were not significant. Feed conversion efficiency were 4.45, 3.79 and 3.85 for group A, B and C respectively and the values were found non-significantly different. The result indicated that feeding of mother in terms of energy did not have any significant effect on DM intake, live weight changes, growth velocity and feed conversion efficiency upon their kits.

**Key words:** Rabbit, kit, growth, energy, nutrition

### Introduction

The domestic rabbit (*Oryctolagus cuniculus*) is emerging as viable livestock species (Cheeke, 1989). Rabbit meat is acknowledged as of high quality meat, being high in protein but low in fat and cholesterol (Jones, 1990; Hamda et al., 1995). The climatic conditions, commercial factors, ecological environment, religious points of view, social practices and technological aspects support the rabbit raising potentials in Bangladesh (Micro Industries Development Assistance Society, 1992). Energy influence the daily gain, increase dressing percentage and reduce feed conversion ratio. Litter weight at weaning was more influenced by dietary energy (Tawfeek, 1996; Prasad and Karim, 1998). The findings of this research will help to encourage consuming rabbit meat that will lead to fulfill the protein gap of the country and ultimately the socio-economic condition of the people will be uplifted. Therefore, with this idea keeping in view, the experiment has been undertaken to study the effect of maternal nutrition on their kits.

### Materials and Methods

The experiment was conducted at the Animal Nutrition field Laboratory, Bangladesh Agricultural University, Mymensingh, Bangladesh over a period from November 24, 1999 to May 14, 2000. It was conducted to study the effect of maternal nutrition (having different dietary energy intake during gestation and weaning period) on growth, intake and feed efficiency of young rabbits (kits) produced from subsequent mothers.

**Feeding of mother rabbits:** Eighteen pregnant rabbit does were taken and grouped into three having six each and fed three different mixtures (having 2300, 2500 and 2700 Kcal ME/kg diet), represented as T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub> (Table 1) with almost iso-nitrogenic mixture throughout the gestation and lactation period. The locally available green grasses and fresh water were offered ad-libitum. After giving birth of those mothers, the kits were with them for 35 days. In that time they took their mother's diet.

**Experimental design and dietary treatments:** Fifteen young rabbit kits were taken randomly from those three different groups of mother (5 from each group) and allocated to three groups according to their mother's diet (T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>) (Table 2). The young rabbits were then housed individually in a steel cage. Metal feeder and bottle water were provided at the front of each cage. All kits were fed same concentrate mixture (T<sub>2</sub>) with ad-libitum green grass for two months.

Table 1: Ingredients and proximate composition of mother's diet

Ingredient	Price (Tk. kg <sup>-1</sup> ) #	Treatments		
		T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
<b>Composition of concentrate mixture (%)</b>				
Maize	11.00	27.00	30.00	40.00
Wheat	9.50	15.00	18.00	16.00
Wheat bran	7.50	35.00	32.00	21.00
Til oil cake	8.00	12.50	9.50	9.50
Full fat soybean	12.50	10.00	10.00	13.00
Common salt	6.00	0.50	0.50	0.50
Vitamin L	380.00	0.25	0.25	0.25
*L-Methionine	350.00	0.15	0.15	0.15
<b>Nutrient composition (g/100 g DM)</b>				
Crude protein (%)		16.18	15.55	16.09
** ME (Kcal/kg)		2303.50	2493.10	2721.70
+ Ca (%)		0.37	0.30	0.30
+ Av. P (%)		0.26	0.25	0.24
Concentrate mixture cost (Tk. kg <sup>-1</sup> )		10.80	10.90	11.40

# Price in 1999, \* Rhone-Poulenc Agrovet Bangladesh Limited

\*\* Calculated from the manual of selected Topics in Animal Nutrition;

+ Calculated value

Table 2: Layout of the experiment

Initial live weight (kg)	Replication	Treatments (body weight in gm)		
		A	B	C
	R <sub>1</sub>	460.00 (1)	500.00 (6)	600.00 (11)
	R <sub>2</sub>	480.00 (2)	500.00 (7)	550.00 (12)
	R <sub>3</sub>	560.00 (3)	511.25 (8)	490.00 (13)
	R <sub>4</sub>	520.00(4)	480.00 (9)	446.30 (14)
	R <sub>5</sub>	510.00 (5)	490.00 (10)	460.00 (15)

Figure in parenthesis indicates animal tag number, A = Weaned young rabbits from mother fed diet T<sub>1</sub>, B = Weaned young rabbits from mother fed diet T<sub>2</sub>, C = Weaned young rabbits from mother fed diet T<sub>3</sub>

**Traits considered:** To compare the growth performance of young rabbits among different treatment groups, the following parameters were studied:

**Feed intake:** Concentrate mixture was supplied twice daily in each cage (morning and evening) with ad-libitum (5% in excess of requirement) green grasses. Daily feed consumption (green grass and concentrate) of kits under different treatment groups was recorded.

**Live weight:** Birth weights of kits were recorded within 2 h of

kidding and only alive kits at birth were included in this analysis. The subsequent body weight of kits was recorded after each 7th days up to 14th week.

**Average daily gains (ADG):** Average daily body weight gains at different weeks were calculated and recorded separately as follows:

$$ADG = (Final\ live\ weight - Initial\ live\ weight) / 7$$

**Growth velocity (GV):** The growth velocity was calculated as described by Chand *et al.* (1996) in a given period of time.

$$GV = \frac{FW - IW}{IW}$$

Where, FW = Final body weight, IW = Initial body weight

**Mortality:** Kit's mortality was observed daily in each replication. The chi-square test was done for comparing the mortality of kits in each group.

**Feed conversion ratio:** It was calculated by dividing the total DM intake of 5 kits in each treatment with average live weight (g) gain.

**Chemical analysis of feed:** Samples collected from different treatment groups were analyzed followed by Association of Official Analytical Chemists (1984) method.

**Statistical analysis:** Completely randomized design (CRD) was followed in this study. The data were analyzed statistically followed by the technique described by Steel and Torrie (1980). Significant differences among the treatment were identified using LSD. The chi-square test was done for comparing the mortality and fertility of rabbits in different treatment groups.

**Results and Discussion**

**Post weaning litter performance:** The final live weight (g) of young rabbit in group A was slightly lower (1293.16 ± 66.94) than other two groups (1560.39 ± 95.52 and 1519.15 ± 97.86 in group B and C respectively) but did not differ significantly (Table 3). The live weight changes (g) of young rabbit among different groups did not differ significantly. The average DM intake from green grass (dhal) and concentrate (g/d); and total dry matter (DM) intake of weaned litter did not differ significantly among different groups (A, B, C) having same diet, though weaned litters in group A consumed slightly lower total DM than others.

The daily live weight gain (g) of young rabbit in group B and C were close (15.20 ± 8.33 and 14.43 ± 9.84 respectively) but kits in group A showed slightly lower (11.25 ± 8.71) daily live weight gain (Fig. 1) whose mother fed diet with 2300 Kcal/kg ME. National Research Council (1977) recommended the 2500 Kcal DE/kg for rapid growth of rabbit, which support the current result. Singh *et al.* (1994) also agreed with this study that reported the 17.86 g daily live weight gain and higher DM intake in ration consisting of 25% kudzu vine hay. But, Spreadbury (1978) showed that rabbit of 1250g body weight, gaining 40g daily, required 1100 Kcal ME per day.

Table 3: Feed intake and growth performance of rabbit kits

Parameters	Groups			Level of significance
	A	B	C	
Initial live weight (g)	506.00 ± 12.14	496.25 ± 32.96	509.26 ± 18.44	NS
Final live weight (g)	1293.16 ± 66.94	1560.39 ± 95.52	1519.15 ± 97.86	NS
Total live weight gain (g)	787.16 ± 60.97	1064.14 ± 58.33	1009.89 ± 68.86	NS
Daily live weight gain (g)	11.25 ± 8.71	15.20 ± 8.33	14.43 ± 9.84	NS
Growth velocity	1.56 ± 0.02	2.14 ± 0.02	1.98 ± 0.01	NS
Dry matter intake (g/d):				
Green grass	116.72 ± 15.57	134.53 ± 13.96	129.75 ± 17.97	NS
Concentrate	233.81 ± 31.00	269.09 ± 27.92	259.55 ± 35.94	NS
Total	350.53 ± 46.57	403.62 ± 41.89	389.30 ± 53.91	NS
Daily DM intake (g)	50.08	57.66	55.61	NS
Feed conversion ratio	4.45	3.79	3.85	NS

A = Litter produced from mother fed 2300 Kcal ME/kg diet; B = Litter produced from mother fed 2500 Kcal ME/kg diet, C = Litter produced from mother fed 2700 Kcal ME/kg diet

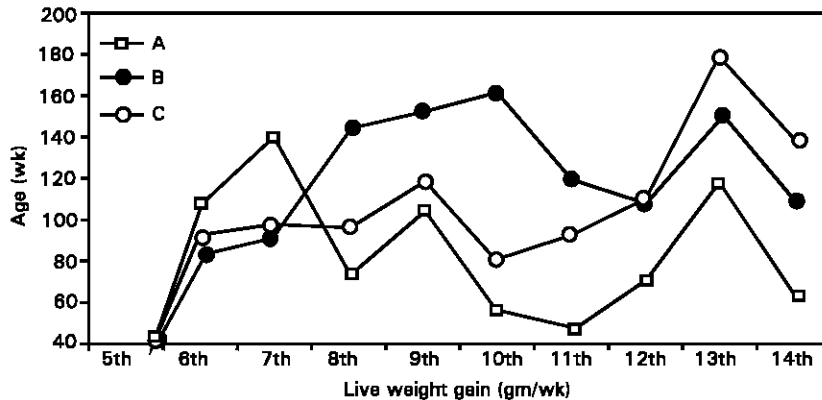


Fig. 1: Post weaning live weight changes of kit (g/wk)

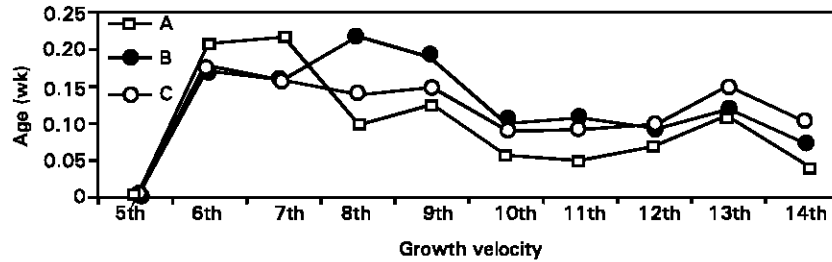


Fig. 2: Growth velocity of kits

The estimated value of GV in groups A, B and C did not differ significantly. The growth velocity (GV) in group A declined sharply (Fig. 2) from the very beginning up to the end of the experiment (5th to 14th week) compared with other groups (B, C). It may be caused due to lower energy concentration given in-group A. No literature was found upon the effect of level of energy on growth velocity of kits.

Feed conversion ratio of young rabbit did not differ significantly among different groups though groups A showed slightly higher (4.45) feed conversion efficiency than other two groups (3.79 and 3.85). It may be caused due to higher energy concentration in that diet. Dickerson (1987) reported the feed conversion ratio is 0.43, which contradicts with this study. Improvement in feed efficiency due to higher digestibility of nutrient and slightly more TDN has been reported by Singh *et al.* (1994), which support the current result.

From the above discussions it may be concluded that the mother fed different levels of dietary energy did not have any significant effect on dry matter intake, live weight gain, growth velocity and feed conversion efficiency upon its post weaned kits. Its suggests that post weaned kits were found to be free from effects of feeding their dams.

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