# STUDY ON THE OPTIMAL CRUDE FIBER CONTENT OF GROWING REX RABBIT DIET

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## ABSTRACT

40 healthy Rex rabbits of 40 days old were selected, divided into 4 groups randomly and fed the different crude fibre (CF) level diet. The dietary CF content was 7%, 9%, 12% and 14%, respectively. The diarrhoea incidence, growth performance and digestibility were controlled. The daily gain of the four groups was: 23.92±2.68, 25.53±2.49, 27.81 ± 2.90 and 24.80±3.37 g, respectively. The third group was the best and it reached significant different compared with the first group ($P<0.01$) and the other two groups ($P<0.05$). The feed conversion rate was 2.95, 2.91, 2.87 and 3.52 respectively. The third group was the lowest, and significantly different to the 4$^{th}$ group ($P<0.05$). The diarrhoea frequency was 59.33%, 20.67%, 0% and 0%, respectively. The digestibility coefficients of nutrients for the different diets were: crude protein (79.68, 76.01, 75.03 and 73.19%), ether extract (89.51, 88.00, 85.86 and 85.39%), N-free extract (75.92, 74.32, 73.10 and 63.33%), ash (38.30, 36.82, 34.77 and 33.65%) and CF (20.82, 21.40, 19.66 and 17.01%), respectively. With the increase of CF content in the diet, the digestibility of all the nutrients descended significantly ($P<0.05$). When the CF content is 7 to 9%, the differences of digestibility of ether extract, CF and ash were not significant. When the CF content is 12% and 14%, the difference of digestibility among crude protein, ether extract and ash were also not significant ($P>0.05$). For an optimal growth and health of growth Rex rabbits, a minimum of 12% CF must be present in the diet.

**Key words**: growth Rex rabbits, CF content, daily gain, feed conversion ratio, diarrhoea frequency, nutrient digestibility.

## INTRODUCTION

Rabbit is non-ruminant plant-eating animal, and the crude fibre (CF) has the important effect on keeping normal digestion. But the optimal CF requirements not constant and differs is great. CF not only provides nutrition, but has the function of maintaining

micro-ecological balances of gut, promoting digestive system development, raising the reproductive performance (GU, 2002). The present work tried to determine the adequate CF level on growth Rex rabbits.

## MATERIAL AND METHOD

### Animals

40-45 days old healthy Rex rabbit (half female and half male) were selected, and divided into 4 groups with 10 each group randomly. Four kind of diet with different CF content were fed respectively.

### Diets

Four kind of Rex rabbit diets with different CF content were designed. The CF content of diets was 7%, 9%, 12% and 14%, respectively (Table 1).

**Table 1: Ingredients and composition of diets (%)**

| Group | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Soybean cake | 8.00 | 9.47 | 0.00 | 8.50 |
| Corn | 24.00 | 21.00 | 19.43 | 21.90 |
| Peanut vine | 7.00 | 12.00 | 25.04 | 37.50 |
| Wheat bran | 48.00 | 50.00 | 37.77 | 17.50 |
| Peanut cake | 6.00 | 5.00 | 15.52 | 12.35 |
| Salt | 0.50 | 0.50 | 0.50 | 0.50 |
| Bone meal | 1.50 | 1.15 | 0.66 | 0.80 |
| Qiu-jing[2] | 0.50 | 0.50 | 0.50 | 0.50 |
| Zeolite | 4.00 | 0.00 | 0.00 | 0.00 |
| Met | 0.15 | 0.13 | 0.20 | 0.15 |
| Lysine | 0.10 | 0.00 | 0.13 | 0.05 |
| Tu-le[1] | 0.25 | 0.25 | 0.25 | 0.25 |
| Chemical composition | | | | |
| DE (MJ/kg) | 10.46 | 10.42 | 10.04 | 10.04 |
| Crude protein (CP) | 17.05 | 17.00 | 17.00 | 17.00 |
| Ca | 0.82 | 0.64 | 0.60 | 0.65 |
| Total P | 0.76 | 0.73 | 0.57 | 0.48 |
| Lys | 0.75 | 0.70 | 0.70 | 0.72 |
| Met+Cys | 0.61 | 0.60 | 0.60 | 0.60 |
| Crude fibre (CF) | 7.08 | 9.12 | 12.00 | 14.14 |

[1] Tu-Le is a special vitamin and mineral additive for rabbit.

[2] Qiu-Jing is the special anti-coccidiosis drug for rabbit.

**Experimental procedure**

The rabbits were raised in cages outdoor; two rabbits were in one cage (2000cm$^2$). The rabbits were fed with pellet and drunk freely. The rabbit healthy condition is observed. The feed intake, diarrhoea incidence, weight were recorded and the diarrhoea frequency, daily gain and the feed conversion rate are calculated.

Five (45-days old) rabbits were chose and one rabbit was in one cage raises. The experiment is divided into two stages of preparation phase (7 days) and experiment phase (5 days). The rabbits were fed 3 times every day during experiment. The feed intake and faeces were collected and weighted accurately every day. The faeces were dehicrated in 65 - 70 ℃ for 24 hours to air dried matter and ground to meal.

The crude protein (CP), ether extract (EE), CF, ash, N-free extract (NFE) and CF content were measured according to AOAC, being the data analysed in an ANOVA procedure by SAS.

## RESULTS AND DISCUSSION

As can be seen in Table 2, daily gain, feed conversion ratio and the diarrhoea frequency which fed different CF level was significantly different. The daily gain of the four groups was 23.92, 25.53, 27.81 and 24.80 g, respectively. The third group was the best and it reached clearly different compared with the first group ($P<0.01$) and significant different with the other two groups ($P<0.05$).

The feed conversion rate (FCR) was 2.95, 2.91, 2.87 and 3.52 respectively. The first 3 groups showed a significantly better FCR than 4th group ($P<0.05$). The feed intake raised as the CF content increased ($P<0.01$). The diarrhoea frequency was 59.33, 20.67, 0 and 0% respectively.

With the increase of CF content in the diet, the digestibility of all the nutrients (Table 3) descended significantly ($P<0.01$). When the CF content is 7-9%, the difference of digestibility of EE, CF and ash was not significant ($P>0.05$). When the CF content is 12% and 14%, the differences of digestibility among CP, EE and ash were also not significant ($P>0.05$). These results were similar with those reported by TANG *et al.* (1999) and HEN *et al.* (2000).

Therefore, for an optimal growth and health of growth Rex rabbits, a minimum of 12% CF must be present in the diet.

**Table 2. Effect of different crude fibre content diet on daily gain, FCR and diarrhoea frequency.**

| Group | Original Weight(g) | Finished Weight（g） | Daily Gain(g) | Daily Feed Intake(g) | FCR | Diarrhoea Frequency |
|---|---|---|---|---|---|---|
| 1 | 596.87±35.47 | 1099.82±90.55 | 23.92±2.68$^{c}$ | 70.50±2.52$^{a}$ | 2.95$^{a}$ | 59.33 |
| 2 | 601.01±35.23 | 1137.14±94.4 | 25.53±2.49$^{b}$ | 74.26±2.33$^{b}$ | 2.91$^{a}$ | 20.67 |
| 3 | 598.40±33.38 | 1182.41±87.83 | 27.81 ±2.90$^{a}$ | 79.82±2.43$^{c}$ | 2.87$^{a}$ | 0 |
| 4 | 598.07±38.52 | 1118.87±108.12 | 24.80±3.37$^{b}$ | 87.38±2.32$^{d}$ | 3.52$^{b}$ | 0 |

**Table 3: Effect of dietary crude fibre content on nutrient digestibility**

| | CP | EE | NFE | ASH | CF |
|---|---|---|---|---|---|
| 1 | 79.68±2.71$^{a}$ | 89.51±3.31 | 75.92±2.36$^{b}$ | 38.30±1.65$^{b}$ | 20.82±2.03$^{b}$ |
| 2 | 76.01±1.85$^{ab}$ | 88.00±2.69 | 74.32±2.11$^{b}$ | 36.82±2.08$^{b}$ | 21.40±1.31$^{b}$ |
| 3 | 75.03±1.97$^{b}$ | 85.86±2.52 | 73.10±1.25$^{b}$ | 34.77±1.66$^{a}$ | 19.66±1.67$^{ab}$ |
| 4 | 73.19±1.70$^{b}$ | 85.39±2.16 | 63.33±1.59$^{a}$ | 33.65±1.19$^{a}$ | 17.01±1.91$^{a}$ |

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