

SHORT REPORT

**Growth of Weaning Laboratory Rats (Wistar strain)  
using Different Formulated Diets**

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Laboratory rats originate from the wild brown rats (*Rattus norvegicus*). There are more than 70 species of the genus *Rattus* (family *Muridae*). Males gain weight more quickly and became larger than females of the same strain.<sup>1, 2</sup> The main components of food for animals are water and dry matter.<sup>3</sup> Laboratory animals should be fed nutritionally adequate food without any contamination daily. Nutrition is an important environmental factor which can have profound effect on the quality of experimental results. Protein deficiency may cause results in poor growth, poor reproductive and lactation performance, hypoproteinemia and anemia, edema, and muscle wasting. Young rats fed diets deficient in a single amino acid had poor hair coats with areas of alopecia, weakness, lethargy and weight lost. The animal feed should contain moisture, crude fiber, crude protein, essential vitamins minerals, crude fat and carbohydrate for providing appropriate nutrition. The percentage of water in pelleted diet at normal room temperature should be between 7 and 12 percent.<sup>4</sup> There are many brands of ready-made feed and formulations reported in the literature which have been found to support and provide for growth. However, these formulations are either too expensive or are not practical to use in Myanmar.<sup>5</sup>

It is necessary to formulate an adequate ratio of locally available feed ingredients to ensure rapid growth, prevent nutritional

diseases, develop and maintain resistance to infection and provide for an attractive and palatable product to adult stages. Therefore, this study was conducted in weaning stage of laboratory rats with different formulated feeds of an adequate ratio of locally available feed ingredients.

The main objective of this study was to provide the lab animals with optimum nutritional value in order to get faster growth in the shortest time with the least cost in nursery periods, and to find the effect of five formulated animal feeds on growth changes on albino rats from weaning stage to adult stage.

This laboratory-based experimental study was done in Laboratory Animal Services Division, DMR (POLB) and nutrients analysis of formulated diets was done in Food Laboratory, UMFCCI, Yangon, Myanmar. The contents of moisture, ash, crude protein and crude fiber were analyzed by AOAC-2000. Healthy weaning albino rats of 25-28 days old (thirty males and twenty females) were selected and divided into 5 groups; each group contained 10 number of rats (6 males and 4 females). Males and females were kept in separated polypropylene cages with wood shavings bedding materials. Their initial body weights were measured by the balance (Ohaus Corporation, Pine Brook,

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NJ USA). Animals were kept at 23-25°C room temperature. Cleaned cages, covers and water bottles were provided throughout this study. Each formulated diet was done by pellet machine and then these pellets were dried with big dry oven at 121°C for 30 minutes. Then, each formulated diet and clean water were provided *ad libitum* to each animal group daily. Formulated diet (32 grams) was fed to each experiment rat as daily consumption. The feeding trial was begun at weaning stage and ended at the onset of sexual maturity. Weight gain status by using balance weekly was recorded up to another 45 days.

Table 1. Content analysis of ingredients in different diets

| Ingredients                | Diet 1 (%) | Diet 2 (%) | Diet 3 (%) | Diet 4 (%) | Diet 5 (%) |
|----------------------------|------------|------------|------------|------------|------------|
| Dry fish meal              | 15.0       | 15.0       | 15.0       | 15.0       | 15.0       |
| Rice powder                | 12.5       | 12.5       | 12.5       | 12.5       | 12.5       |
| Rice bran                  | 15.0       | 15.0       | 15.0       | 15.0       | 15.0       |
| Peanut cake meal           | 12.5       | 12.5       | 12.5       | 12.5       | 15.0       |
| Corn meal                  | 15.0       | 15.0       | 15.0       | 15.0       | 15.0       |
| Wheat bran                 | 15.0       | 15.0       | 15.0       | 15.0       | 15.0       |
| Variety of bean & pea meal | 12.5       | -          | -          | 12.5       | 12.5       |
| Niger cake meal            | 2.5        | 2.5        | 2.5        | -          | -          |
| Soy bean meal              | -          | 12.5       | -          | -          | -          |
| Shan soy bean meal         | -          | -          | 12.5       | -          | -          |
| Sesame cake meal           | -          | -          | -          | 2.5        | -          |
| Crude protein              | 12.68      | 16.15      | 14.77      | 14.97      | 12.40      |
| Ether extract (Crude fat)  | 2.30       | 3.51       | 2.53       | 2.53       | 2.66       |
| Crude fiber                | 3.94       | 4.00       | 5.71       | 4.73       | 5.47       |
| Moisture                   | 32.32      | 26.98      | 26.09      | 23.07      | 18.13      |
| Ash                        | 6.80       | 7.08       | 7.47       | 7.84       | 7.89       |
| carbohydrate               | 41.90      | 42.28      | 43.43      | 46.86      | 41.45      |
| Energy value (kcal/100g)   | 238        | 268        | 259        | 275        | 287        |
| Moisture (Bc) Pol          | 4          | 2          | 2          | 2          | 2          |
| Ash (Bc) Pol               | 7          | 8          | 8          | 7          | 7          |

In this study, it was found that the nutrient values were different from batch to batch due to the different geographical areas of the country from where they were cultivated, fertilizer used and ways of cultivation. Depending on the five kinds of formulated diet, body weights gained were different: female 81.5 gm and male 112.9 gm for diet-one, female 98.5 gm and male 147.4 gm for diet-two, female 97.9 gm and male 115.8 gm for diet-three, female 102.1 and male 104.3 gm for diet-four, female 97.3 gm and male 102.2 gm for diet-five. Among them, the best growing weight gain of Wister strain rats was received in diet-two.

Formulated diet-three and diet-four are better than diet-one and -five.

In this study, group-two got the highest growth and weight due to the higher crude protein content of formulated feed although five different types of feed were acceptable for weaning stage of laboratory rat and good for growth. So, weaning rats of the group-two received the most suitable supplemental feed in their nursery period. During the study, analyses of formulated diet-one, diet-two, diet-three, diet-four and diet-five were carried out to confirm the actual nutrient composition of formulated diet. It was found that they were not much different from those of calculated values.

In addition, sesame cake meal and Niger cake meal used in this study contained rich source of fat, vitamin and other nutrients that are essential for reproduction and growth of the offspring. There was no significance in body lengths of weaning stage of rats in all groups. The costs of five formulated diets were not much different significantly. It could be concluded that the better growth was achieved in weaning laboratory rats, feeding with diet-two which contains higher protein and quality when compared to other diets.

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