

## Effects of Rumen Epithelial Scrapings Inclusion In Diets For Grower Rabbits

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### Abstract

Twenty-five (25) Crossbred grower rabbits were used to assess the effects of Rumen Epithelial Scrapings (RES) inclusion in the diets for rabbits. The five treatment groups consisting of five replicates of one rabbit per replicate in a Completely Randomized Design (CRD). The dietary treatments comprised graded levels of RES at 0, 2.5, 5, 7.5 and 10% in T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>, T<sub>4</sub> and T<sub>5</sub> diets respectively. Total feed offered was 100g/rabbit/day. Feed intakes were similar ( $P < 0.05$ ) across the dietary treatments, 1, 2, 3, and 4. Daily weight gain and feed to gain ratio were not affected ( $P < 0.05$ ) by increasing rumen epithelial scrapings except in T<sub>5</sub> (10% RES) that recorded (10.01) and (8.51) respectively. Lower feed cost/kg significantly reduced ( $P < 0.05$ ) the cost/kg gain (N) in diets 2 (N444.4), 3 (N447.7) and 4 (N449.5) compared with the control diet 1 (N450). Conclusively, grower rabbits can utilize up to 7.5% rumen epithelial scrapings based diets without any adverse effect on performance.

**Keywords:** Grower rabbits, rumen epithelial scrapings, feed to gain ratio, cost/kg gain, inclusion

### Introduction

There is an increasing interest in rabbit production in the developing countries, as a means of producing meat from forages and agricultural by-products in the tropics (Babayemi *et al.*, 2014; Adedoyin and Bamimore, 2018). Rabbits are especially well adapted to backyard rearing systems, with little capital and fodder resources which are usually limiting factors in animal production. Rabbits reared according to the techniques appropriate to the environment can do much to improve the family diet of many of the most needy rural families, while at the sametime supplying them with a source of income. With more advance bio-technology rabbit production can also help to supply big City meat markets. It has infact been stated that hindgut digestion which takes place in the rabbit is a superior adaption for dealing with wide varieties of feed staffs (Iyeghe-Erakpotobor and Esiero, 2010). However, to ensure sustainability in livestock production there is a need to optimize usage of the by-products of the abattoir as sources of nutrients for farm animals (Abubakar, 1998). A number of slaughterhouse byproducts are presently being wasted, such as rumen epithelial scrapings, blood, meat scraps, etc. Rumen contents can be prepared as a few material either by sun-drying involves spreading the material on any heat absorbing surface and constantly raking it to facilitate uniform drying. Ensiling involves mixing rumen contents with other ingredients such as molasses and packing the mixture tightly in silos or other suitable containers under anaerobic conditions (Adedoyin *et al.*, 2013). Abubakar (1998) opined that rumen contents are a good source of vitamins, especially the B vitamins. And that the dried material contains 15.43% crude protein, 1.91% ether extract, 39.08% crude fibre, and 31.71 Nitrogen free extract (NFE). Thus, the objectives of this study is to evaluate the nutritional values of rumen epithelial scrapings based diets for grower rabbits.

## Materials and Methods

A total of twenty-five, four to five weeks old crossbred rabbits of mixed breeds (New Zealand white and Chinchilla) and sexes, obtained from I.A.R.T, Ibadan, Oyo State were randomly assigned to treatment

(n = 5 rabbits per treatment). The rabbits of average initial weight of 450g were individually housed and maintained in battery cages in an open sided house. Rumen Epithelial Scrapings (RES) were obtained from Bodija market abattoir, Ibadan. The RES are then dried and grounded separately to a fine powder and replaced with groundnut meal at 0, 2.5, 5, 7.5, and 10% w/w in treatment 1(control), 2, 3, 4 and 5 respectively (Table 2). Body weight and feed intakes were determined weekly while feed to gain ratio was estimated as outlined by Olomu (2011). Feeding was done in the morning at 08:00 hours in earthen flat bottom pots. The concentrate and forage were offered to give a total of 100g feed/rabbit/day. Feed wastage and/left over were measured daily before the morning feeding so as to determine the total feed intake for eight weeks, water was provided ad libitum in plastic drinkers (Iyeghe-Erakpotobor, 2012). Mortality ratio were also calculated as percentage of total Number of rabbits per group. Data collected were subjected to the analysis of variance test, (2007). Means of significant result was compared by Duncan's. Proximate analysis of the rumen epithelial scrapings were analyzed according to the procedures described by AOAC (1990).

**Table 1: Proximate Composition(%) of Rumen Epithelial Scrapings and Groundnut meal.**

| Nutrients %           | Rumen Epithelial | Groundnut Meal |
|-----------------------|------------------|----------------|
| Moisture              | 3.99             | 7.32           |
| Crude Protein         | 66.14            | 43.12          |
| Crude Fiber           | 1.66             | 5.9            |
| Ether                 | 4.33             | 12.01          |
| Ash                   | 4.01             | 4.48           |
| Nitrogen Free Extract | 9.98             | 11.12          |

**Table 2: Composition of Concentrate Diets fed Grower Rabbits**

| Ingredient                  | Replacement levels of Rumen Epithelial Scrapings (RES) |                          |                        |                          |                         |
|-----------------------------|--------------------------------------------------------|--------------------------|------------------------|--------------------------|-------------------------|
|                             | T <sub>1</sub> (0%RES)                                 | T <sub>2</sub> (2.5%RES) | T <sub>3</sub> (5%RES) | T <sub>4</sub> (7.5%RES) | T <sub>5</sub> (10%RES) |
| Maize                       | 45.0                                                   | 45.0                     | 45.0                   | 45.0                     | 45.0                    |
| Groundnut meal              | 36.50                                                  | 34.0                     | 31.5                   | 29.0                     | 26.5                    |
| Rumen Epithelial            | -                                                      | 2.5                      | 5.0                    | 7.5                      | 10.0                    |
| Maize offal                 | 15.00                                                  | 15.00                    | 15.00                  | 15.00                    | 15.00                   |
| Bone meal                   | 3.00                                                   | 3.00                     | 3.00                   | 3.00                     | 3.00                    |
| Salt                        | 0.25                                                   | 0.25                     | 0.25                   | 0.25                     | 0.25                    |
| Vitamin/Mineral Premix      | 0.25                                                   | 0.25                     | 0.25                   | 0.25                     | 0.25                    |
| <b>Total</b>                | <b>100.00</b>                                          | <b>100.00</b>            | <b>100.00</b>          | <b>100.00</b>            | <b>100.00</b>           |
| <b>Analyzed Composition</b> |                                                        |                          |                        |                          |                         |
| Crude Protein               | 18.10                                                  | 18.31                    | 18.55                  | 18.67                    | 18.97                   |
| Crude Fibre                 | 9.80                                                   | 9.14                     | 8.80                   | 8.16                     | 8.50                    |
| Met. Energy(Kcal/ME/kg)     | 2450                                                   | 2403                     | 2389                   | 2400                     | 2409                    |

**Table 3: Performance of Grower Rabbits fed Rumen Epithelial Scrapings Based Diets**

| Parameter          | Replacement levels of Rumen Epithelial Scrapings (RES) |                          |                        |                          |                         | SEM  |
|--------------------|--------------------------------------------------------|--------------------------|------------------------|--------------------------|-------------------------|------|
|                    | T <sub>1</sub> (0%RES)                                 | T <sub>2</sub> (2.5%RES) | T <sub>3</sub> (5%RES) | T <sub>4</sub> (7.5%RES) | T <sub>5</sub> (10%RES) |      |
| Initial Weight (g) | 449                                                    | 450                      | 449                    | 451                      | 450                     | 0.05 |
| Final Weight (g)   | 1039                                                   | 1049                     | 1031                   | 1028                     | 1011                    | 0.72 |
| Feed intake        | 75.3 <sup>bc</sup>                                     | 78.01 <sup>b</sup>       | 79.11 <sup>ab</sup>    | 81.80 <sup>ab</sup>      | 85.2 <sup>a</sup>       | 10.9 |
| Weight Gain        | 10.53 <sup>a</sup>                                     | 10.69 <sup>a</sup>       | 10.39 <sup>b</sup>     | 10.30 <sup>b</sup>       | 10.01 <sup>c</sup>      | 0.5  |
| Feed to Gain       | 7.15 <sup>bc</sup>                                     | 7.29 <sup>b</sup>        | 7.61 <sup>b</sup>      | 7.94 <sup>b</sup>        | 8.51 <sup>a</sup>       | 0.99 |
| Cost/kg-Feed       | 630 <sup>a</sup>                                       | 609 <sup>b</sup>         | 588 <sup>c</sup>       | 566 <sup>d</sup>         | 545 <sup>c</sup>        | 0.04 |
| Cost/kg-gain       | 450.5                                                  | 444.4                    | 447.7                  | 449.5                    | 463.8                   | -    |

abc... means with different superscripts along rows the significantly different (P>0.05)

SEM – Standard Error of Mean

## RESULTS AND DISCUSSION

Performance of grower rabbits fed different levels of rumen epithelial scrapings (RES) is shown in Table 3. Feed intakes were similar with a slight increase with an increasing levels of Rumen Epithelial Scrapings (RES) from 2.5 to 7.5% in the diets 2, 3, and 4. Similar intakes observed in the diets 2 (78.01), 3 (79.11) and 4 (81.8) for grower rabbits fed 2.5 to 7.5% RES could indicate a threshold of intake which might have been approached as the forage level increased. This could probably also suggests, an inability of the rabbits to further increase their gastrointestinal tract capacity to accommodate any further increase in feed intake as RES level increased from 2.5 to 7.5% level as also suggested (Iyeghe-Evakpotobor *et al.*, 2012). Daily weight gain and feed to gain ratio were not affected (P>0.05) by increasing RES except in T5 (10% RES) that recorded (10.01) and (8.51) respectively. A significant lower weight gains of grower rabbits fed diet 5 (10% RES) in this study compared to others (diets 1, 2, 3, and 4) could be as a result of the depressing effect of increasing rumen epithelial scrapings (RES) in the diet. Also, that possibly an increased level of RES brought about on rich bacteria protein a drastic changes in the biological functions of grower rabbits, poor feed efficiency and utilization, disturbances in metabolism of energy, mineral and vitamin balances, and enzymatic reactions with an impaired fermentative mechanisms in the cecum (NAP, 1991; Nwagu and Iyeghe-Erakpotobor, 2012; Adedoyin *et al.*, 2013) Lower feed cost/kg gain obtained with increasing level of RES up to 7.5% in the diet indicates the potential of reducing cost of producing rabbits by increasing the level of rumen epithelial scrapings in the diet of grower rabbits.

## CONCLUSION

It is concluded from this study that grower rabbits can utilize up to 7.5% rumen epithelial scrapings diet based without any adverse effect on performance. Also, that lower feed cost and cost/kg weight gain were obtained.

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