EFFECTS OF RUMEN EPITHELIAL SCRAPINGS INCLUSION IN DIETS FOR GROWER RABBITS

Adedoyin A. A.

Department of Agricultural Education, Biotechnology Unit.
The College of Education, Lanlate, Oyo State, Nigeria. (Former Emmanueal Alayande College of Education, Oyo, Lanlate Campus).
E-mail: akintundedoyin@yahoo.com or adedayoakintude1@gmail.com
Gsm: 08139396741

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_1, T_2, T_3, T_4 and T_5 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 T5 (10% RES) that recorded (10.01) and (8.51) respectively. Lower feed cost/kg significantly reduced ($P<0.05$) the cost/kg gain (₦) in diets 2 (₦444.4), 3 (₦447.7) and 4 (₦449.5) compared with the control diet 1(₦450). 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 neediest 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 Chinchinlla) 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 Epithetical 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 determined 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_1 (0%RES)	T_2 (2.5%RES)	T_3 (5%RES)	T_4 (7.5%RES)	T_5 (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
Total	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
Analyzed Composition					
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)					
	T_1 (0%RES)	T_2 (2.5%RES)	T_3 (5%RES)	T_4 (7.5%RES)	T_5 (10%RES)	SEM
Initial Weight (g)	449	450	449	451	450	0.05
Final Weight (g)	1039	1049	1031	1028	1011	0.72
Feed intake	75.3^{bc}	78.01^{b}	79.11^{ab}	81.80^{ab}	85.2^{a}	10.9
Weight Gain	10.53^{a}	10.69^{a}	10.39^{b}	10.30^{b}	10.01^{c}	0.5
Feed to Gain	7.15^{bc}	7.29^{b}	7.61^{b}	7.94^{b}	8.51^{a}	0.99
Cost/kg-Feed(₦)	630^{a}	609^{b}	588^{c}	566^{d}	545^{c}	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.

REFERENCES

A.O.A.C. (1990). Official Methods of Analysis 13th Edition *Association of Analytical Chemists Washington DC*

Abubakar, M. M. (1998) Slaughterhouse by-products for sustainable livestock production in the tropics. *In: Strategies and Tactics of Sustainable Agriculture in the Tropics (STASAT) Vol. 1* (Eds. M. A. Badejo and A. O. Togun (1998) College Press, Ibadan and Enpract Consultants, Lagos, Nigeria.

Adedoyin, A. A. and Bamimore, I. A. (2018). A guide to selected mini-livestock farming. *In: Introduction to Agricultural System: Principles and Practices. Department of Agricultural Education, The College of Education, Lanlate, Oyo State, Nigeria. Pg 78- 91*

Adedoyin, A. A. Onilude, A. A., Tewe, O. O. and Mosobalaje, M. A. (2013). Nutritional Enhancement of whole Cassava Starch Residue by biodegradation with Fungi Spp. *Elixir Inter. Journal of Biotechnology 60:16064-16068*

Babayemi, O.J. ,Abu O.A. and Opakunbi A (2014). Integrated Animal Husbandry for Schools and Colleges. *Positive Press, Ibadan, Nigeria 299pp.*

Iyeghe-Erakpotobor, G.T., Tudunwada, I.K. Tijjani, A. Muhammad, I. R. and Bello, N. (2012). Influence of level of groundnut haulms and feeding systems on performance of growing rabbits. *Nigerian Journal of Animal Production. Vol 39(1) pp. 64-73*

Nwagu, F. O. and Iyeghe-Erakpotobor, G. T. (2012). Protein and Energy partitioning for growth by rabbits fed soybean cheese waste diet and lablab hay. *Nigerian Journal of Animal Production. Vol. 39 (1) pp. 54-63*

Olowu, J. M. (2011). Monogastric Animal Nutrition: Principles and Practice. *2nd Edition St. Jackson Publishing. Benin City Nigeria.*

SAS Institute (2007). SAS Users' Guide Statistics *Version 6.12 Edition SAS Institute. Inc. Carry, NC.*

The National Academics Press (1991). Micro Livestock: Little-Known Small Animals with a promising Economic Future. *National Academy of Sciences. xx 448 pp.*