

GROWTH PERFORMANCE, NUTRIENT DIGESTIBILITY AND CARCASS CHARACTERISTICS OF RABBITS FED VARYING LEVELS OF GROUNDNUT HAULM WITH CONCENTRATE

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ABSTRACT

The aim of this study was to assess the growth performance, nutrient digestibility and carcass characteristics of rabbits fed varying levels of groundnut haulm (GH) with concentrate. All together, 54 weaner rabbits of 6-7 weeks of an average initial weight of 735.81g were included in completely randomized design and fed six (6) dietary treatments of: 100% concentrate and 0% groundnut haulms (T₁, control), 80% concentrate and 20% GH (T₂), 60% concentrate and 40% GH (T₃), 40% concentrate and 60% GH (T₄), 20% concentrate and 80% GH (T₅) and 0% concentrate and 100% GH (T₆). In most of the treatments, the total feed intake, the body weight and carcass weight showed no significant ($p>0.05$). There were significant difference ($p<0.05$) in visceral organs and sensory characteristics when rabbits are fed groundnut haulms included diets than concentrate diets.

Keywords: Rabbits, groundnut haulms, concentrate, growth, carcass

INTRODUCTION

Food and Agricultural Organization (2004) reported low per capita animal protein consumption in developing countries particularly in humid tropics which calls for improvement in the production of short-cycle animals like rabbit. If rabbits are judiciously managed, they can kindle about six times in a year with the average of 6-7 kittens per kindling (Adeyemo *et al.*, 2013). This improvement is also essential by the rapid population growth with resultant increase in the demand for protein from animals. Rabbits have been identified to play vital role in the supply of quality protein especially in rural and peri-urban areas within the tropics (Egbo *et al.*, 2001) this is because, they mature early and their meat has high protein, low fat, low energy and low cholesterol value (Adeyemo *et al.*, 2013). Rabbits have a short generation interval with high litter size and can be raised at the backyard which is well suited to small holder rabbit producers. It is important to note that, feed supply and quality is the major limiting factor to vibrant rabbit production in Nigeria. To make rabbit rearing more viable as a small-scale business, Makinde *et al.* (2014) had advocated the development of alternative feeding materials that are relatively cheap when compared with commercial feeds or conventional feedstuffs. Rabbits can be raised on high fibre feeds and materials that are not utilized by man and since they do not compete with man for grains, they have the advantage over swine and poultry (Adeyemo *et al.*, 2013). One of the non-conventional feedstuff and under-exploited forage feedstuff for rabbits in Nigeria is groundnut haulms which has high crude protein value.

MATERIALS AND METHODS

The experimental animals were sourced from the Rabbitry Multiplication Unit Minna, of the Niger State Ministry of Livestock and Fisheries. Groundnut haulms was sourced from Animal feed sellers, opposite NEPA office Minna. Concentrate was sourced from Sammy ventures, behind U.K. Bello arts theater, Minna. The study lasted for twelve weeks during which the rabbits were served with concentrate diet in the morning (8:00 am) and groundnut haulms (4:00 pm) of a known weight on a daily basis. Water was also provided *ad libitum*. Left over feeds were recorded to determine the daily feed intake.

RESULT AND DISCUSSION

In **Table 1.0** significant statistical differences between treatment and the parameters measured were noticed ($P < 0.05$). The final body weight (BW) of rabbits irrespective of treatment was all doubled their initial BWs. Nonetheless, very significant statistical difference was observed in feed intake observed between the treatments studied. Studies in rabbits have shown that BW tends to increase correspondingly with increase in feed intake, particularly forage (as seen in T_3) (Houndonougbo *et al.*, 2012; Maidala 2016) in which case feed intake have been positively correlated with level of fibre in rations. In these studies, poor digestion and utilisation of protein were reported to be responsible for the poor growth against the expected growth rate. The growth performance in terms of feed intake, body weight gain, final body weight and feed conversion ratio of rabbits fed only concentrate and those on 40% concentrate plus 60% groundnut haulms were similar. This may be attributed to the fact that forage is considered an important feed for rabbits growth and they are capable of digesting leaf protein effectively (Cheeke and Patton, 1982). This finding agrees with Bangbose *et al.* (2003) who reported that rabbits can perform well with mixed regimen of forages and concentrates up to 50 % reduction without any adverse effect on growth. Also, Iyeghe-Erakpotobor *et al.* (2002) observed significant effect of diets on intake of rabbits offered a combination of concentrate, grass and other forages. Similarly, Shiwoya and Musa (2006) reported that feeding of forage like mango, banana and tridax leaves can successfully support growth when fed with concentrate diets for weaner rabbits.

Table 1.0: Growth performance of rabbits fed varying levels of groundnut haulms and concentrate based diets

Parameters (g)	T1	T2	T3	T4	T5	T6	SEM	P-value
Initial body weight	727.11	728.22	741.22	742.22	742.44	784.55	13.93	0.71
Total feed intake	5754.69 ^a	6263.43 ^a	5320.12 ^b	5450.93 ^{ab}	4903.93 ^c	5197.71 ^b	24.43	0.00
Body weight gain	1033.30 ^a	1000.01 ^a	1100.12 ^a	1031.04 ^a	986.33 ^b	991.51 ^b	32.59	0.02
Final body weight	1760.41 ^{ab}	1728.23 ^b	1841.34 ^a	1773.26 ^{ab}	1728.77 ^b	1740.06 ^b	48.26	0.01
Feed conversion ratio	5.56 ^a	6.26 ^a	4.83 ^b	5.28 ^{ab}	4.97 ^b	5.24 ^{ab}	0.84	0.03

abc = means in abc = means in the same row carrying different superscript are significantly ($p < 0.05$) difference.

The meat sensory properties of rabbits fed groundnut haulms and concentrate based diets showed beneficent ($P < 0.05$) increase in the appearance, tenderness and overall acceptability of the meat (Table 2.0). While significant statistical difference was recorded in the organoleptic properties of fried rabbit meat in this study between the treatments ($P < 0.05$), other studies obtained contrary results (Raïssa *et al.*, 2018;)

Table 2.0: Sensory characteristics of rabbit meat fed varying levels of groundnut haulms and concentrate based diets

Parameters	T1(keys)	T2()	T3()	T4()	T5()	T6()	SEM	P-value
Colour	8.33	7.66	7.66	8.00	7.66	7.33	0.47	0.33
Juiciness	8.66	8.66	8.00	7.66	7.66	7.66	0.66	0.22
Appearance	7.66 ^a	8.00 ^a	7.66 ^a	7.33 ^a	7.66 ^a	6.33 ^b	0.48	0.03
Flavour	8.33	7.33	7.33	7.00	7.66	7.33	0.67	0.28
Tenderness	8.66 ^a	7.00 ^a	6.00 ^b	6.66 ^{ab}	6.00 ^b	6.33 ^b	0.44	0.00
Aroma	7.33	7.00	7.33	7.00	7.33	6.67	0.47	0.93
Overall	8.33 ^a	8.33 ^a	7.66 ^{ab}	7.33 ^{ab}	7.33 ^{ab}	7.00 ^b	0.62	0.01
acceptability								

ab = means in the same row carrying different superscript are significantly ($p < 0.05$) different

Conclusion

1. Feeding rabbits solely on concentrate or inclusion of 60% groundnuts haulms to concentrate have similar feed intake, body weight gain, final body weight and feed conversion ratio.
2. Carcass parameters such as carcass weight, dressing percentage, neck length, cervico-thoracic region weight, tail length, heart weight and spleen weight of animals fed only concentrate and those fed with concentrate along with groundnut haulms up to 80% or solely on groundnut haulms were similar. Improvement was observed in lungs weight, kidney weight and intestine length the rabbits were fed groundnut haulms included diets than when fed solely on concentrates.
3. Sensory characteristics such as colour, flavor, juiciness and aroma are similar between the treatment diets. Additionally, acceptability of rabbit meat fed only concentrate and those fed concentrate along with up to 80% groundnut haulms are similar.

REFERENCES

- Adeyemo, A. A., Adeyemi, O. A., Ekunseitan, D. A. and Taiwo O. S. (2013). Effect of concentrate to forage ratio on the performance and haematological parameters of growing rabbits. *Global Journal of Biology Agriculture and Health Sciences*, 2 (2)
- Apata, E.S., Soniran. A.G., Ikudoro, F.O., Akinteru, O., Osineye, F. and Doherty, F. (2005). Taste panel socio-economic characteristics and the organoleptic properties of rabbit cooked by five different methods. *Journal of Agriculture, Forestry and the Social science*. **32j**. 139-146.
- Bamghose. A.M., Akinnusi. F.A.O and Adegbenro, K.A. (2003). Growth response of weaner rabbits fed concentrates/forage supplement based diet. *Proceeding 18th Annual Conference of the Nigerian Society of Animal Production. September 16-18th, 2003*, Federal University of Technology, Minna, Nigeria, **98-99**.
- Cheeke, P. R. and Patton, A. F. (1983). The significance of fibre in rabbit production. *Journal of Applied Rabbit Research*. **3(3)**: 20-23.
- Egbo, ML., Doma, U. D and Lacdaks, A. B (2001). Characteristics of small-scale rabbit production and management in Bauchi metropolis. *Proceedings of the 26th Annual Conference of Nigerian Society of Animal production*. March 18th-21st Ahmadu Bello University Zaria,
- F.A.O (2004). Food and Agricultural Organization. Year Book, Rome.
- Houndonougbo, M. F., Chrysostome, C. A. A. M., Attakpa, S. E., Sezan, A., and Dehou, H. B. (2012). Growth Performance of Rabbits Fed Palm-Press Fibres-Based Diets. *ISRN Veterinary Science*, 1–5. doi:10.5402/2012/915729
- Isikwenue, J.O., Akpodiete O.J., Omoye, S.I. & Okagbare, G.O. (2010). The effect of replacing groundnut cake with urea-Treated and fermented brewers dried grain on nutrient digestibility, retention and carcass characteristic of broiler finisher. *Nigeria Journal of Animal products*, **37(1)**1-12.
- Iyeghe-Erakpotobor, G. T. (2002). Effect of concentrate and forage type on performance digestibility of growing Rabbits under sub-humid tropical condition. National Animal Production Research institute Ahmadu Bello University. Shika-Zaria *Asian Journal of Animal and veterinary Advances*, **2(3)** 125– 132.
- Maidala, A., Bello, I.B. & Jarmari, S.M. (2016) Comparative Responses of Weaner Rabbits to Concentrate Diets Supplemented with Different Forages. *Journal of Biology and Genetic Research* 2 (3): 2545 – 5710.
- Makinde, O.J., Enyigwe, P.C., Babajide, S.E., Atsumbe, J.A., Ibe, E.A. and Samuel, I. (2014). Growth performance and carcass characteristics of Finisher broilers fed rice offal based diets supplemented with exogenous enzyme. *Greener Journal of Agricultural Sciences*. **4(4)**: 144 -149.

- Malik, A. A., Balogun, O.O. and Dikko, A.H. (2015). An evaluation of the effect of storage of a locally Produced natural vitamin premix on the performance of laying hens. *Journal of Agriculture, Forestry and Social Science*, **8 (1): 208-214**.
- Raïssa1 W.L.M.F., Athanase, O.K., Frank, Y.K. and Sébastien, N. (2018). Effect of mixing two leafy vegetables on the quality of rabbit meat. *European Journal of Biotechnology and Bioscience*, **6(6): 30-36**.
- Shiawoya, E.L. & Musa J.A. (2006). Evaluation of the feeding potentials of mango leaves (*Man gferaindica*) Banana (*Musa spp*) foliage and tridax (*Tridaxprocumbens*) as supplemented to conventional feeds for growing rabbits. *Journal of Agricultural Research and Development*, **5 (1): 1-6**.

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