

INFLUENCE OF CASTRATION AND DIFFERENT DIETS ON GROWTH PERFORMANCE AND NUTRIENT DIGESTIBILITY OF WEANER RABBITS

Saheed, S., Tsado, D. N., Tiamiyu, S. A., Habu, T., and Habu, T.

DEPARTMENT OF ANIMAL PRODUCTION

FEDERAL UNIVERSITY OF TECHNOLOGY MINNA, NIGER STATE.

ABSTRACT

Twenty four castrate and non-castrate weaner rabbits fed different diets were investigated to determine the growth performance and nutrient digestibility. The rabbits were assigned randomly to four treatments, each with three replicates and two animals per replicate. One hundred grams of feed were offered per rabbit/day and their body weight were taken on weekly basis. Other parameters measured were initial weight, final weight, total body weight gain, average body weight gain, average feed intake and feed conversion ratio. The results shows that castrates had significantly higher values in all growth performance parameters. Apparent digestibility coefficient values shows that castrates had significantly higher values of all parameters measured over the control. It was concluded that castration had significant effect on growth performance and nutrient digestibility of weaner rabbits.

Key words: Rabbits, Castration, Different diets, Performance.

INTRODUCTION

Rabbits are pseudo ruminant animals that do not compete with man for food. The potential of rabbits can be fully maximized in areas where forages are readily available. Forage and cereal by-products can be utilized as the primary source of protein and energy with high level of production (Cheeke, 1986). Rabbits have been reported to be prolific with short gestation period of 30-32 days, producing 4-5 litter per year that consists of 6-8 kitten on the average (Biobaku, 1997). Animal protein supply and consumption is low in Nigeria especially among the low income and nonwage earners (Iyange&Orewa, 2009). The average estimated crude protein requirement of an adult Nigerian is between 65 and 85g per person daily, 35g of which should come from animal source (Adetunji and Adepoju, 2011). Atsu, 2002, put the average consumption of animal protein at 4.5g/head/day as against the 35g/head/day. Castration is one of the management activities practiced in different part of the country. Castrates have better meat quality and they grow faster than entire males. Castration can also be employed in controlling the rapid breeding capacity of rabbits whenever there is a female rabbit as well.

MATERIALS AND METHODS

Experimental location

The study was carried out at Teaching and Research Farm of Department of Animal production Federal University of Technology, Gidan Kwano Campus Minna. Minna is located in the North central zone of Nigeria with the geographical coordination of 9^o 37' North 6^o 33' East. Minna has land area of 6784 km and it is located at the latitude of 1475 m above the sea level in the southern guinea savanna vegetation of Nigeria. Minna is characterized with two different seasons which are the wet season (April to October) and dry season (November to March). The average annual rainfall is between 1100 and 1600 mm and mean ambient temperature ranges from 21°C to 36°C latitude and longitude (Ovimap, 2015).

Experimental Diet

The diets used for the experiment comprise of maize, GNC, maize offal, rice bran, bone meal, Methionine, lysine, premix and salt which are purchased from the local market in Minna town also known as Kure market. *Tridax procumbens* and milk weed was used as part of the experimental diet and was sourced around the Research farm.

Experimental Animal and Design

Twenty four (24) weaner rabbits with an average weight of 960.5gram aged between 10 – 12 weeks were used. The animals were randomly assigned to 4 treatments with 6 rabbits per treatment and 3 replicate with 2 rabbits per replicate. Some of the experimental rabbits were castrated using open castration method. Rabbits in treatment (T₁) were non-castrate and fed concentrate and roughage, T₂ were castrates fed concentrate only, T₃ were castrates fed roughage only, T₄ were castrates fed concentrate and roughage. The animals were sourced from Naij Integrated concept, Oshogbo in Osun state of Nigeria.

Management of animals

The animals were managed under intensive management system in hutches and two animals were kept in a hutch. Concentrate and forage were the main diet offered to animals in each replicate and one hundred grams of feed was served to each rabbit in a day with half ($1/2$) served between 7 – 8am daily and the remaining half was served between 3 – 4 pm daily. Water was also offered ad-libitum throughout the experiment period. Digestibility study was carried out at the end of the experiment.

Data analysis

All the data collected were subjected to analysis of variance (ANOVA) according to Steel and Torrie (1980) using statistical package for social science version 20 (SPSS).

RESULTS AND DISCUSSION

The growth performance characteristics of the experimental rabbits are presented in table 1

The values of final body weight gain of castrates fed concentrate only differ significantly from those of non-castrates (control). Similarly, castrates fed concentrates and forages differ significantly from the control in term of total body weight gain and average body weight gain. In average feed intake, castrates fed forages only differ significantly from those fed the control diets. Castrates generally recorded significant difference in their favour in feed conversion ratio compared to the non-castrates. The better performance of castrates over non-castrates in most parameters measured could be as a result of castration. Higher average feed intake obtained by castrates fed roughages only over non-castrates in this study could be attributed to the type of diet and castration. In contrast to this Bello and Adama (2012), reported that the mean feed intake recorded for castrates (goat) was significantly ($p < 0.05$) higher than the intact males (1107.1 vs. 1071.2g).

Table 2 showed that Dry matter and crude protein digestibility of castrates are significantly better than the non-castrates. Crude fibre and ash content values of castrates differ significantly from those of non castrates. The nitrogen free extract and total digestible nutrients of castrates fed concentrates only differs significantly from those of non-castrates (control). This agrees with the work of Bello and Adama (2012), who reported that castrates shows higher digestibility value in DM, CP, EE, ASH, and NFE but not in CF. This also agrees with the findings of (Muhikambele *et al*, (1994) who reported that castration significantly affects digestibility.

Table 1: Growth performance of castrate and non- castrates fed different diets

Parameters	T ₁	T ₂	T ₃	T ₄	SME	LSD
Initial weight (g)	891.50	1005.50	984.33	918.33	23.64	NS
Final weight (g)	1095.80 ^b	1308.80 ^a	1163.80 ^{ab}	1122.70 ^{ab}	32.69	*
Total wt. gain (g)	204.33 ^b	303.33 ^a	179.50 ^b	304.33 ^a	20.43	*
Average wt. gain (g/w)	25.54 ^b	37.92 ^a	22.44 ^b	38.04 ^a	2.55	*
AFI (g/w)	572.12 ^b	343.02 ^c	640.44 ^a	564.35 ^b	34.33	*
FCR	21.52 ^b	9.05 ^d	28.54 ^a	14.84 ^c	2.76	*

^{a,b,c,d} means along the same row with the same superscript are not significantly different (p<0.05) SME- Standard error of the mean, AFI – Average feed intake, FCR- Feed conversion ratio, LSD- Level of significance, NS- No significant difference, * - Significance difference.

Key

T₁= Non-castrates fed concentrate and forages., T₂= Castrates fed concentrate only,T₃= Castrates fed forages only. T₄= Castrates fed concentrate and forages

Table 2. Nutrient Digestibility of Castrates and Non-castrates rabbits fed different diets.

Parameters	T ₁	T ₂	T ₃	T ₄	SEM	LS
Dry matter (%)	80.93 ^c	93.86 ^a	90.93 ^a	84.77 ^b	1.95	*
Crude protein (%)	84.87 ^c	96.87 ^a	92.27 ^b	91.47 ^b	1.64	*
Crude fibre (%)	75.82 ^b	84.45 ^{ab}	88.19 ^a	84.10 ^{ab}	2.03	*
Ether extract (%)	88.16 ^b	94.54 ^a	93.25 ^a	87.911 ^b	1.15	*
Ash (%)	40.83 ^c	86.11 ^a	90.71 ^a	55.66 ^b	7.95	*
NFE (%)	91.71 ^b	96.19 ^a	91.65 ^b	90.07 ^b	0.89	*
TDN (%)	90.20 ^b	97.09 ^a	67.15 ^c	93.13 ^{ab}	4.43	*

^{a,b,c} means along the same row with the same superscript are not significantly different (p<0.05), NFE- Nitrogen free extract, TDN- Total digestible nutrient, SEM- Standard error of the mean, LS- Level of significance, *- Significance difference

Key

T₁= Non-castrates fed concentrate and forages.,T₂= Castrates fed concentrate only.,T₃= Castrates fed forages only., T₄= Castrates fed concentrate and forages.

Conclusion

It can be concluded based on the results of this work that:

Castrated rabbits are superior to non-castrates in final body weight gain, total body weight gain, average body weight gain and apparent nutrient digestibility.

Recommendation

From the results gotten from this study, it is recommended that male rabbits not required for breeding programme should be castrated for optimum growth performance and nutrient digestibility.

REFERENCES

Adetunji, M.O and A.Adepoju (2011) Evaluation of household protein Arthur, P.F., Archer, J.A., Johnston, D.J., Herd, R.M., Richardson, E.C. and Parnell, P.F. (2001) *J. Animal Science*. **79**: (In Press).

Bello, A and T. Z. Adama (2012) Studies on Body Weight and Linear Body Measurements of Castrates and Non-Castrate Savannah Brown Goats. *Asian Journal of Animal Sciences* 6(3):140-146

- Biobaku, W. O. and E. B. Oguntona. 1997. The effects of feeding multi-nutrient miniblocks and pelleted diet on the growth of rabbits. *Nigerian Journal . Animal. Production.* 24: 147-249.
- Cheeke, P. R., Grobner, M. A. and Patton, M. M. (1986). Fibre digestion and utilization in rabbits. *Journal Applied Rabbit Research* 9:25-30
- <http://www.maplandia.com/nigeria/kwara/ilorinwe/oke-oyi/>. Retrieved on 30/12/2019
- Iyange, C., & Orewa, S. (2009). Determinant of Daily Protein Intake among Rural and Low Income Urban Households in Nigeria. *American Eurasians Journal of Scientific Research*, 290-301.
- Muhikambele, V.R.M., L.A. Mtenga, E. Owen, G.C. Kifaro and D.S.C. Senda *et al.*, (1994). Effect of castration and diet on performance and feed utilization in Saanan goats. Proceedings of the Biennial Conference of the African Small Ruminant Research Network on Small Ruminant Research and Development in Africa, Kampala (Uganda), December 5-9, 1994, ILRI, Kenya, pp: 221-224.
- Ovimap, (2015). Ovi location map: Ovi Earth Imagery Data.
- SPSS (Statistical Package for Social Sciences). 2006. Version 15.0, SPSS Inc., USA.
- Steel, R. G. and Torrie, J. H. 1980. Principles and procedures of statistics. A biometrical approach . 2nd ed. McGraw-Hill. New York.