



PROCEEDINGS OF THE 11th WORLD RABBIT CONGRESS

Qingdao (China) - June 15-18, 2016

ISSN 2308-1910

Session Quality of products

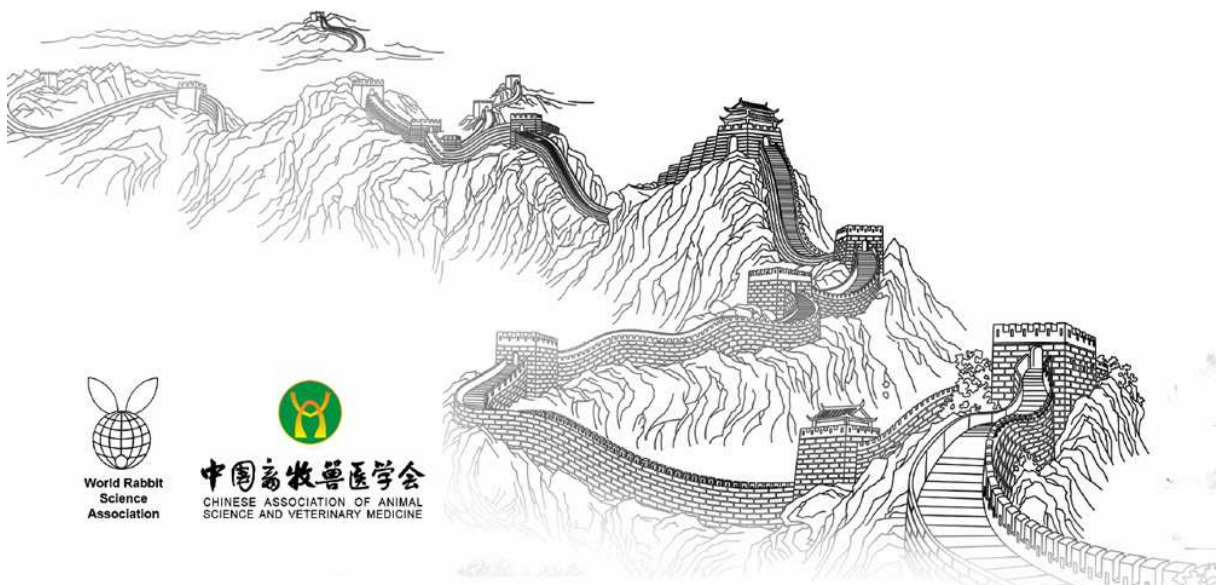
Ayandiran, S.K., Odeyinka, S.M.

CARCASS QUALITY AND BLOOD COMPONENTS OF WEANER RABBITS FEEDS BREAD WASTE AND *Moringa oleifera* LEAF.

Full text of the communication

How to cite this paper :

Ayandiran, S.K., Odeyinka, S.M., 2016 - Carcass quality and blood components of weaner rabbits feeds bread waste and Moringa oleifera Leaf. Proceedings 11th World Rabbit Congress - June 15-18, 2016 - Qingdao - China, 745-748.



CARCASS QUALITY AND BLOOD COMPONENTS OF WEANER RABBITS FED BREAD WASTE AND *Moringa oleifera* LEAF

Ayandiran, S.K* , Odeyinka, S.M

Department of Animal Sciences, Obafemi Awolowo University, A234, Ile-Ife, Osun State, Nigeria.

*Corresponding author: skayandiran@gmail.com

ABSTRACT

The study evaluates the carcass quality and blood components of sixty mixed breeds of weaner rabbits fed bread waste and *Moringa oleifera* leaf. The rabbits, 5-6 weeks old were allotted to four treatments (15 rabbits per treatment) in a completely randomized design. The experiment lasted for eight weeks. Four concentrate diets (T1, T2, T3 and T4) were compounded by inclusion of bread waste and *Moringa oleifera* leaf at 0, 25, 50 and 100% respectively. There was no significant difference ($p>0.05$) in the slaughter weight of the rabbits across the treatments while there was significant difference among the means of the hot carcass weight. The hind limb and fore limb weight of rabbits fed diet T4 were significantly higher ($p<0.05$) than those fed other diets. There was no significant difference in the weight of visceral organs such as liver, kidney and heart across the treatments except the lungs. There was significant difference ($p<0.05$) in the blood cholesterol content of rabbits across the treatments. There were no significant differences in the packed cell volume and the white blood cell counts while the red blood cell count was significantly higher in rabbits fed diets T2, T3 and T4 than diet T1. Furthermore, the total protein was significantly higher ($p<0.05$) in rabbits fed diet T4 than other diets. The albumin content of rabbits fed diets T4, T3 and T2 were significantly higher than diet T1. It could be concluded that the inclusion of bread waste and *Moringa oleifera* leaf in diet of weaner rabbits had no adverse effect on the carcass quality and blood components.

Key words: carcass quality, blood components, rabbits, bread waste, *Moringa oleifera*

INTRODUCTION

In Nigeria, rabbits have played a significant role in the supply of animal protein to rural and urban areas. They are efficient converters of feed to meat and can utilize up to 30% crude fibre as against 10% by most poultry species (Egbo *et al.*, 2001). Rabbit meat is tasty, low in cholesterol, sodium and fat but high in protein (Olabanji *et al.*, 2007). Due to these attributes of rabbit over other livestock, researchers have put in more effort to improve on rabbit nutrition for better performance. To make rabbit rearing more viable, Makinde *et al.* (2014) have advocated the development of alternative feeding materials that will be relatively cheap when compared with commercial feeds or conventional feedstuffs. Bread waste, a by-product of bakery industry is rich in energy, low in fibre but high in vitamin (Al-Tulaihan, *et al.*, 2004) however, its utilization as unconventional feedstuff for rabbits has not been reported. The nutritional qualities of *Moringa oleifera* are excellent, which constitutes a source of high quality forage for animals (Dounon *et al.*, 2012). The plane of nutrition has measurable effect on blood components and may be used to assess the health status of animals. Therefore, the present study evaluated the carcass quality and blood components of weaner rabbits fed bread waste and *Moringa oleifera* leaf.

MATERIALS AND METHODS

Animals and experimental design

Sixty weaner rabbits of mixed breed aged 5 - 6 weeks with initial weight range of 400 - 600g were used for the study which lasted for 8 weeks. The rabbits were randomly allocated to four treatments (15 rabbits per treatment) in a completely randomized design where feed and water were served daily.

Bread waste was collected, oven dried, packaged and stored for subsequent use. Fresh *Moringa oleifera* leaves were obtained from Sheep and Goat Unit, Obafemi Awolowo University Teaching and Research farm, Ile Ife, Nigeria and air dried. Four concentrate diets (T1, T2, T3 and T4) were compounded by direct substitution of corn bran and brewers dried grain with bread waste and Moringa leaf at 0, 25, 50 and 100% respectively. The experimental diets were fed to rabbits at 4% of their body weight. At the end of the experiment, three rabbits from each treatment were slaughtered through the cervical dislocation for carcass analysis using the method of Odeyinka *et al.*, (2007). The skin, head, loin, forelimb, hindlimb and visceral organs were removed and weighed.

Laboratory Analyses

Blood samples were collected into labelled Ethylene-deamine tetra-acetic acid (EDTA) treated tubes for haematological analysis and into tubes without anticoagulant for serum biochemical evaluation (Bitto and Gemade, 2001).

Table 1: Gross composition of experimental diets for rabbits

Ingredients (%)	T1	T2	T3	T4
Corn bran	40.00	30.00	20.00	-
Brewer' dried grain	40.00	30.00	20.00	-
Bread waste	-	10.00	20.00	40.00
<i>Moringa oleifera</i>	-	10.00	20.00	40.00
Groundnut cake	17.00	17.00	17.00	17.00
Bone meal	2.00	2.00	2.00	2.00
Methionine	0.25	0.25	0.25	0.25
Lysine	0.25	0.25	0.25	0.25
Vitamin premix	0.50	0.50	0.50	0.50

¹Premix provided per kg diet: vitamin A, 12,000 IU; vitamin D3, 1,000 IU; vitamin E acetate, 50 mg; vitamin K3, 2 mg; biotin, 0.1 mg; Fe, 100 mg; Cu, 20 mg; Mn, 50 mg; Co, 2 mg; I, 1 mg; Zn, 100 mg; Se, 0.1 mg; Robenidine, 66 mg.

Statistical Analysis

Data obtained was subjected to analysis of variance procedure of General Linear Model and the Duncan's New Multiple Range Test option of SAS (2008) was used for mean separation.

RESULTS AND DISCUSSION

Table 2 shows the carcass quality of the experimental rabbits. There was no significant difference in the means of the slaughter weight across the treatments while the hot carcass weights were different ($p < 0.05$). The loin weight of rabbits in T2 was similar ($p > 0.05$) to those of T4 but significantly higher than T1 and T3. The fore and hind limbs of rabbits fed diet T4 were more developed respect to those of other groups. There was no significant difference in the weight of visceral organs such as liver, kidney and heart across the treatments except the lung weight. The hot carcass weight values obtained were comparable to Ojebiyi *et al.* (2013) (764.79 – 878.00 g) but higher than reported by Adekojo *et al.* (2014) (354.31 – 738.40 g). The loin weight of rabbits in this study was relatively similar to that of Baiomy and Hassanien, (2011). Even Odetola *et al.* (2012), showed lower value in rabbit hind and fore limbs weight than our. The result in this study agreed with the observation of Frederick, (2010). The values obtained for liver, kidney and heart in this study were higher than values of Odeyinka *et al.* (2007) but similar to that reported by Frederick, (2010).

Table 2: The carcass characteristics of rabbits

Parameters (g)	T1	T2	T3	T4	PROB.	MSE
Slaughter weight	1025.00	1050.00	987.50	1125.00	0.6374	32.10
Hot carcass weight	815.80 ^b	882.50 ^{ab}	825.00 ^b	987.50 ^a	0.1129	27.68
Loin	227.50 ^b	325.00 ^a	237.50 ^b	312.00 ^a	0.0501	17.43
Head	100.00	115.00	112.50	125.00	0.7310	6.21
Fore limb	25.00 ^b	32.50 ^{ab}	37.50 ^{ab}	55.00 ^a	0.0676	4.53
Hind limb	50.50 ^c	52.00 ^c	75.00 ^b	100.00 ^a	0.0004	7.64
Liver	38.12	40.98	39.75	41.89	0.3168	4.36
Kidney	9.09	10.06	9.29	9.53	0.8217	0.79
Heart	2.79	3.43	2.84	3.07	0.4760	0.16
Lungs	4.92 ^b	5.37 ^b	6.81 ^a	6.73 ^a	0.3841	0.43

^{abc} Means with different letters on the same row differ significantly (Duncan's multiple range test). Fifteen (15) rabbits per treatment were used in the experiment.

Table 3 shows the blood components of the experimental rabbits. The blood cholesterol content of rabbits fed the diet T1 was significantly higher than that of rabbits fed diets containing bread waste and *Moringa oleifera* leaf. There were no significant differences among the means of the packed cell volume and the white blood cell counts of the animals while rabbits fed diets T2, T3 and T4 had significantly higher ($p < 0.05$) red blood cell counts compared to diet T1. Furthermore, the total protein was significantly highest ($p < 0.05$) in rabbits fed diet T4 than others. The albumin content of rabbits fed diets T4, T3 and T2 were significantly higher than diet T1.

The blood cholesterol level was conformed to 35.02 – 40.70 mg/dl values reported by Frederick (2010) for rabbits fed *Moringa oleifera* leaf. This observation agreed with the results of Ghasi *et al.* (1999) where the juice extracted from *Moringa* leaves was found to be a potent hypocholesterolemic agent. The packed cell volume in this study was lower than reported by Frederick, (2010) (43.30 – 46.77%) but conformed to that observed by Odetola *et al.* (2012) (32.00 – 35.00 %).

The rabbits fed diets containing bread waste and *Moringa oleifera* leaf had higher red blood cell counts, according to the claim of Brown *et al.* (2000) which reported an increase of red blood cell count simultaneously with a high quality dietary protein in disease free animals. Also the white blood cell count conformed to $4.34 - 5.88 \times 10^3$ observed by Dairo and Egbeyemi (2012). The values for total protein, albumin and globulin obtained were found to be within the normal physiological range for rabbits (Jenkins, 1993).

Table 3: The blood components of rabbit

Parameters	T1	T2	T3	T4	PROB.	MSE
PCV (%)	32.25	33.82	34.01	34.78	0.0283	1.44
RBC (10^6)	2.84 ^a	4.98 ^a	5.00 ^a	4.93 ^a	0.0346	0.39
WBC (10^3)	4.95	4.70	4.89	4.45	0.3105	0.06
Cholesterol (mg/dl)	41.60 ^a	33.82 ^b	37.53 ^b	35.85 ^b	0.0453	1.08
Total protein (mg/dl)	5.40 ^c	6.43 ^b	6.99 ^{ab}	7.70 ^a	0.0274	0.33
Albumin (mg/dl)	3.30 ^b	3.98 ^{ab}	4.15 ^a	4.69 ^a	0.0473	0.20
Globulin (mg/dl)	2.10 ^b	2.50 ^a	2.84 ^a	2.87 ^a	0.0200	0.13

^{abc} Means with different letters on the same row differ significantly (Duncan's multiple range test). Fifteen rabbits per treatment were used in the experiment.

CONCLUSION

It could be concluded that the inclusion of bread waste and *Moringa oleifera* leaf in the diet of weaner rabbits had no adverse effect on its carcass quality and blood components.

REFERENCES

- Adekojo S. A., Adama T. Z., Aremu A., Ijaiya A. T., Owoleke O. E., Ibrahim A. 2014. Effects of dietary inclusion of Differently Processed *Leucaena leucocephala* Leaf Meal on Carcass Characteristics of Rabbits (*Oryctolagus cuniculus*). *Inter. J. Food. Sci. and Nutr. Eng.* 4(5): 118-127
- Al-Tulaihah, A.A., Najib, H., Al-Eid, S.M. 2004. The nutritional evaluation of locally produced dried bakery waste in the broiler diets. *Pak. J. Nutr.* 3 (5): 294-299.
- Baiomy, A.A and, Hassanien, H. H. M. 2011. Effect of breed and sex on carcass characteristics and meat chemical composition of New Zealand white and Californian rabbits under upper Egyptian environment. *Egypt. Poult. Sci.* Vol 31 (2): 275-284.
- Bitto, I.I. And Gemade, M. 2001. Preliminary investigations on the effect of pawpaw peel meal on growth, visceral organ and endocrine gland weights, testicular morphometry and the haematology of male rabbits. *Global J. P. & Appl. Sci.* 7(4): 611-625.
- Brown, P., M. Preece, J. P. Brandel, T. Sato, L. McShane, I. Zerr, A. Fletcher, R. G. Will, M. Pocchiari, N. R. Cashman, J. H. d' Aignaux, L. Cervenakova, J. Fradkin, L. B. Schonberger, and S. J. Collins. 2000. Iatrogenic Creutzfeldt-Jakob disease at the millennium. *Neurology* 55:1075-1081
- Dairo, F. A. S. and Egbeyemi, O. B. 2012. Response of weaner rabbits to diets containing fermented mixtures of cassava peel and dried caged layers' manure. *Afr. J. Agri. Res.* Vol. 7(49), pp. 6588-6594.
- Dougnon T.J, Aboh B.A., Kpodékon T.M., Honvou S., Youssao I. 2012. Effects of substitution of pellet of *Moringa oleifera* to commercial feed on rabbit's digestion, growth performance and carcass trait. *J. Appl. Pharm. Sci.*; 2(9): 015-019.
- Egbo M L, Doma U D and Lacdaks A B 2001. Characteristics of small scale rabbit production and management in Bauchi metropolis. *Proc.6th Ann. Conf. Nig. Soc. Ani. Prod.* (NSAP), 18 - 21 March, 2001, ABU Zaria: 160 -162.
- Frederick, N.2010. Effect of *Moringa* Leaf Meal on nutrient digestibility, growth, carcass and blood indices of weaner rabbits. Msc thesis. Kwame Nkrumah University of Science and Technology, Kumasi. pp 87.
- Ghasi, S., Nwobodo, E. and Ofili, J.O. 1999. Hypocholesterolemic effects of crude extract of leaf of *Moringa oleifera* Lam in high-fat diet fed Wister rats. *Journal of Ethnopharmacology*, 69: 21-25.
- Jenkins, J.R. 1993. Rabbits. In: Jenkins, J.R. and Brown, S.A. (ed.) *Practitioner's guide to rabbits and ferrets*. American Animal Hospital Association, Lake wood, U.S.A., pp 1-42.
- 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.
- Odetola, O.M., Adetola, O.O., Ijaduola, T.I., Adedeji, O.Y and Adu, O.A. 2012. Utilization of *Moringa oleifera* leaves meal as a replacement for soya bean meal in rabbit's diets. *Sch. J. Agri. Sci.* Vol. 2(12), pp. 309-313.
- Odeyinka S.M., Olosunde A.S., Oyedele O.J. 2007. Utilization of soybean milk residue, cowpea testa and corn starch residue by weaner rabbits. *Livest. Res. Rur. Dev.* 19 <http://www.cipav.org.co/lrrd/lrrd19/9/odey19125.htm>.
- Ojebiyi O. O., Yusuff A.O., Oladunjoye I. O. and Babarinde S. A. 2013. Nutritional evaluation of honey bee slum gum meal as replacement for maize in the feed of growing rabbits. *J. Bio. Agri. and Healt.* Vol.3, No.7.
- Olabanji, R.O., Farinu, G.O., Akinlade, J.A., Ojebiyi O.O., Odunsi, A.A. and Akingbade, A.A. 2007. Studies on haematological and serum biochemical characteristics of weaner rabbits fed different levels of wild sunflower (*Tithonia diversifolia* Hemsl A. Gray) leaf-blood meal mixture. *Inter. J. Appl. Agri. and Apic. Res.* 4 (1&2): 80-89.
- SAS, 2008. SAS Users Guide Statistics, SAS inc. Cary, North California, 2008 edition.

=====