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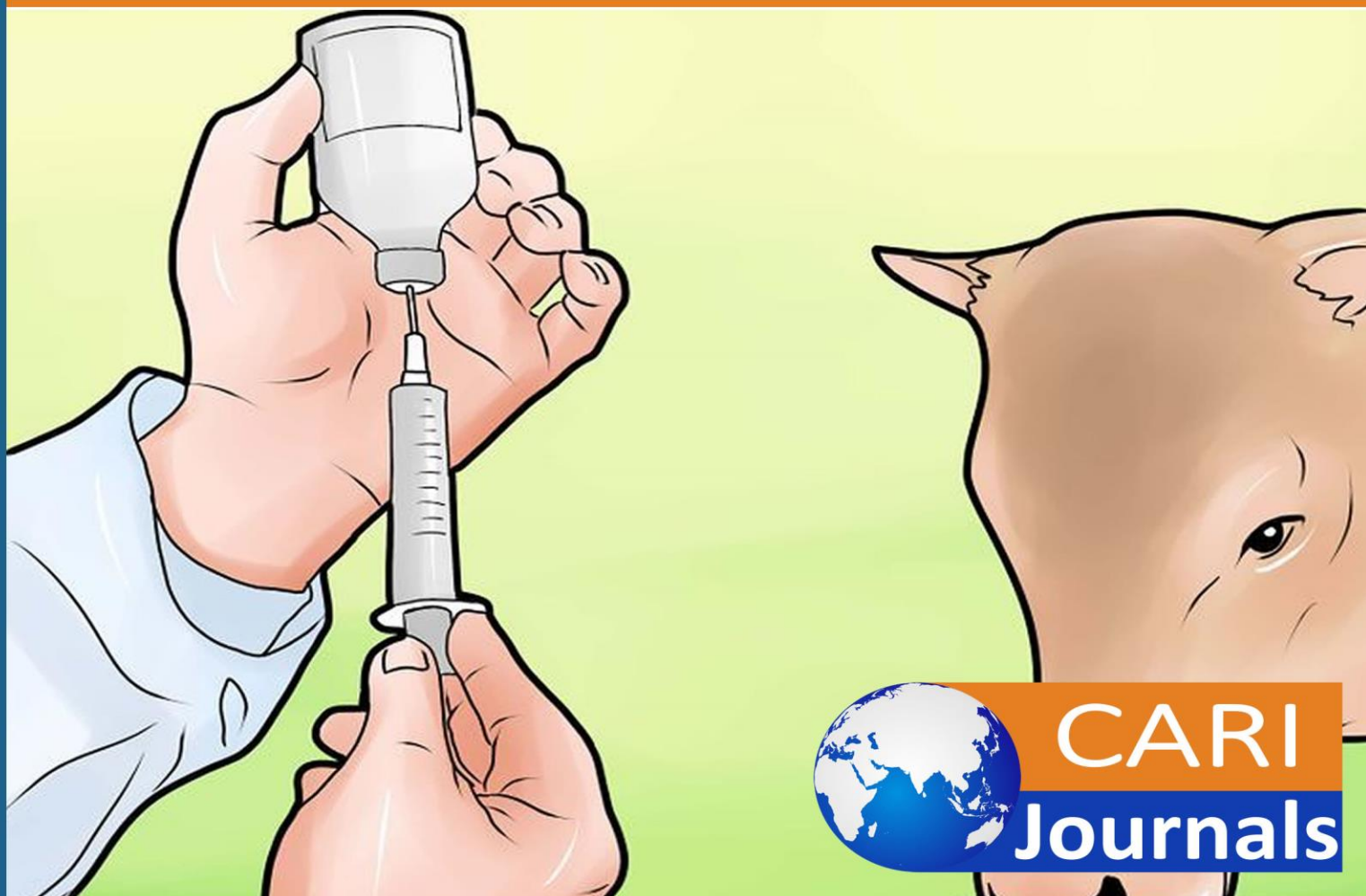

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Performance of Growing Rabbits Fed Graded Levels of *Ziziphus mauritiana* Leaf Meal in a Diets

[*1]A.S. Badakaya,

Jigawa Agricultural Research Institute, P.M.B. 5015, Jigawa,Nigeria

Corresponding Author's Email: danfodite1@gmail.com

[2]B. Umar

Jigawa Agricultural Research Institute, P.M.B. 5015, Jigawa,Nigeria

[3]M.A. Rabiu

Jigawa Agricultural Research Institute, P.M.B. 5015, Jigawa,Nigeria

[4]B.A. Danhassan

Federal College of Agricultural Produce Technology, Kano,Nigeria

ABSTRACT

Purpose: An eight weeks feeding trail was conducted to evaluate the performance of growing rabbits fed graded levels of Zizipus mauritiana leaf meal in a diet.

Methodology: Dietary treatment were designated A, B, C and D which were made up to 100% concentrate, 15%, 30% and 45% Ziziphus mauritiana leaf meal inclusion levels respectively, twenty cross bred growing rabbits of both sexes averaged 72.8g, balanced for weight and were used in a completely randomized experimental design. They were tattooed and randomly allocated to four dietary treatments replicated with seven rabbits. The rabbits were allowed one week pre-conditioning (adaptation) period during which the animals were collected for feed intake, weight gain, and feed conversion efficiency was calculated.

Findings: There were significant ($p<0.05$) differences in all the parameters considered. Diet D had the highest significant ($p<0.05$) effect in terms of weight gain with value of 648g compared to others while the control diet recoded the least value with 436g. similarly, diet D was the most consumed and a significant ($p<0.05$) difference was observed between diet B and C, with the former having a higher value of 124.86g. the result further revealed that as the level of Ziziphus Mauritian leaf increased in the diets lower values for feed conversion efficiency were obtained.

Unique contribution to theory, policy, and practice: This indicates that supplementation with the test ingredient increases the efficiency with which the dies were utilized. Thus, diet D, with the most favorable results among the treatments groups is superior to others. It is therefore recommended for growing rabbits.

Key words: *Rabbits, Leaf meal, feed intake, weight gain, feed conversion efficiency*

INTRODUCTION

The acute shortage of animal protein in the diet of the average Nigeria has been reported and one of the ways of solving the problem is by increasing the production of fast growing and early maturing animals like the rabbit (FAO, 1970). In the present economic condition of the country where there is a great increase in the scarcity of animal protein, as well as the high cost of commercial feed, forages now play an important role by being converted into meat as well as being available almost throughout the year (Aduku *et al*, 1986). The need now arises to change from feeding only concentrate rations as the main diets to supplementing with forages. This would not only reduce the most of feeding but the total cost of production, especially for the small-scale producers who could make a substantial contribution to animal protein supplies in developing countries (Adeosun, 2005).

Feeding is very important in any livestock production industry as it constitutes 60-70% of the total cost of production. There is need to produce low input system with locally available feed stuffs such as, maize offal, wheat bran, and crop residues from legumes that have no nutritional value to man Most forage feeds for rabbits are garden or farm crops whose leaves could be available for feeding when the crops are harvested (Aduku and Olukosi, 1990).

The domesticated rabbit descended from European wild rabbit *Orvctolo is cuniculus*. They are micro livestock that are kept mainly for meat. There are about 66 different breeds of rabbits that are evenly distributed throughout the world. Rabbits were introduced into England in ‘. he late eleventh to twelfth century. Basically, rabbits are classified into fur, fancy and meat breeds Cheeke *et al.*,1987).

The main breeds of rabbits are Chinchilla New Zealand white, California, Dutch, Angora, flemish Giant etc. Rabbits are characterized as small furry animals with long ears and short tails are cheap to purchase, easy to manage no much taboos against eating or keeping them, the animal are quite friendly and can be raised in the back yard or empty room. They do not usually bite and they are not potential health hazards to raisers (Lebas et al., 1586).

Accoding to Iyeghe- Eraktopobor., et a1. (2003) rabbit rearing does not involve heavy capital outlay, therefore, with a little capital a pair of rabbits (male and female) can be bought and multiplied to supply meat for the family and also cash.

Akinmutumi (2004) stated that rabbits are herbivores, monogastric and pseudoruminant animals that can effectively and efficiently convert fodder to food, Rabbits have a unique digestive tract that coverts fibrous material to animal protein (Lebas, et al., 1997). Rabbits can thrive and do very well on cheap food materials such as kitchen wastes, roughages grass and other green vegetable. Rabbits are traditionally raised on high roughage diets (Iyeghe-Erakpotobor, et al., 2002). Lukefahr and Cheeke (1991) advocate raising rabbits on forages with an energy supplement. There are various important constraints associated with keeping rabbits in the tropics. These are inadequate nutrition, poor management, low reproduction efficiency prevalence of diseases, shortage of pure breeding stock and marketing problems associated with the consumption of rabbit meat (Aduku and Olukosi, 1990). Based on the afore-mentioned, this feeding trial was designed to evaluate the performance of growing rabbits fed a complete diet with *Ziziphus mauritiaria* leaf meal included at different levels in diets.

Justification

Inadequate supply of feed both in quality and quantity is one major factor responsible for the low productivity of livestock in the tropics (Ojebiyi et al.,2008). In many developing countries majority of the population suffers from protein deficiency. It is therefore necessary to look for iaeaper and faster ways of getting necessary protein required for normal body growth and functions. Animal protein source have the nutritional advantage of being rich in amino acids hich are readily useful to human body than those of plant origin (Amuefule *ct al.,* 2004). â.abbits are used for research and medical purposes. They are easy to rear, occupy small portion land, and require small capital when compared with other livestock. But with all these there are problems with keeping rabbits in large number. Such constraints include lack of awareness, problem of adoption or reluctance of people to the acceptance of rabbit meat (Aduku and Olukosi, 1990).It was further stated that the ability of rabbits to thrive on forage made their production comparatively cheaper than other livestock. They are good scavengers on home roughage or kitchen waste. Rabbits fed a mixture of legume and concentrates had better performance due to high content of digestible protein and energy of legume (Lukefarh and Goldman, 1985). The objectives of the study were to determine the proximate composition of experimental diets containing graded levels of *Ziziphus mauritiana* leaf and growth performance of growing rabbits on graded levels of *Ziziphus mauritiana* leaves in diets.

MATERIALS AND METHODS

Study area

The study was conducted at the rabbitary unit of the Animal Science Department, Bayero University Kano. Kano State partly lies in the Sudan and Northern guinea vegetative zone (Olopin, 1985) between longitudes 9^0 30' and 12^0 30' North and latitudes 90 30' and 8^0 42' East (KNARDA, 2001) and about 1, 578 feets (481m) above sea level.

Period of the study

An eight weeks feeding experiment was conducted to evaluate the performance of growing rabbits fed graded levels of Ziziphusmauritiana leaf in diets. Twelve (12) weeks old crossbred grower rabbits of both sexes averagely weighing 12.kg were balanced for weight before random distribution to four (4) dietary treatments replicated with seven rabbits per treatment. The rabbits were allowed one week per conditioning period (adaptation) during which a formulated feed was offered prior to the commencement of the experiment hence they were also treated with ivomec injection.

Experimental Designs

The Ziziphusmauritiana leaves were included in concentrate-based diets at o,15,30 and 45% levels to form complete diets. Four dietary treatments were designated where 100% of the concentrate as A (control), 85% of concentrate and 15% of *Ziziphus mauritiana* leaves as B, 70% of concentrate and 30% of *Ziziphus mauritiana* leaves as C and 55% of concentrate and 45% of *Ziziphus mauritiana* leaves as D respectively. The feeding strategy employed was that 100g feed was offered to rabbits individually in the morning around 8:00am and clean water was offered ad libitum, in plastic containers. The feed left over and wastage were daily recorded before feeding.

Data collection

Data on feed intake and weekly weight change were collected. Daily feed intake was estimated by weighing the leftover. At the end of every week rabbits were weighed and the values recorded.

Statistical Analysis

Data collected were subject to analysis of variance using general linear system. Least significant difference test was used to separate means at ($P<0.05$) using the SAS (1999) software.

Table 2. Components of the concentrate meal fed to the experimental rabbits

Ingredient	Proportion (%)
White Maize	32.70
Rice Brand	24.53
Wheat Offal's	24.53
Groundnut Cake (GNC)	9.75
Fish Meal	6.50
Salt	0.50
Premix	0.50
Bone Meal	1.00
Total	**100.00%**

Growth Performance

Data were collected with respect to the initial and final weight of the animals, feed intake and weight gain in each replicate. The values obtained were used to obtained the following:

- Feed intake/rabbit/day in (grm)

  = quantify of feed given refusal (g)
  Number of rabbit x total days of trail

- Daily weight gain/rabbit/day (grm)

  = final live weight-initial weight (g)
  Number of rabbit x total days of rail

- Feed conversion ratio (g) feed gain

  = quantity of feed consumed (g)
  Weight gain

RESULTS AND DISCUSSION

The result of the proximate analysis of the graded of Ziziphus mauritiana supplemented diets fed the growing rabbits are shown in Table 3. The results obtained show that ash content is significantly higher in diets D compared to others. The result of the moisture content however indicates that diets A content the higher amount while diets D is a very dry feed. In terms of try matter content diets D had the highest value which may indicate the possibility of it being more nutritious This is because most nutrients are contained in the try matter component of the feed. The result of the crude protein (CP) analysis shows that diet D contained in the highest amount (24.06%CP). This is adequate as per the physiological state of the experiment animals, i.e growth. The crude fibre (CF) contents of the experimental diets showed similar trend as that of crude protein by increasing as the level of Ziziphus mauritiana leaf was increased, the highest value obtained in diet D (37.47%CF). the extra extract (EE)content of the experimental diets also increased as more amounts of Ziziphus mauritiana lesfs was added across the treatment, the highest content was also recorded in die D (11.78% EE). However the nitrogen free extractives (NFE) content of the diets decreases as levels of Ziziphus Mauritiana leafs increased across the treatments. The highest value obtained in diet A indicates that it content the largest amount of concentrate. Diet D with the least value of NFE shows that it had the highest amount of plant cell well components.

Table 3. proximate composition of graded levels of Ziziphus Mauritiana leaf in diets fed to growing rabbits

Parameters	Diet A	Diet B	Diet C	Diet D
Moisture	9.42	8.89	8.07	7.70
Dry Matter	90.59	91.11	91.93	92.31
CP	9.84	12.03	16.41	24.06
CF	25.14	28.62	29.15	37.47
EE	4.6	6.51	7.04	11.78
NFE	53.80	44.84	36.61	14.14
ASH	6.62	8.00	10.8	12.55

Table 4 Shows the growth performance of growing rabbits graded fed levels of Ziziphus mauritiana in diets. There is significant (P<0.05) difference in the final weight, diet D recorded to be superior to other, and the same weight gain was observed in diets B while diets C and A was the least. In terms of total weight gain the result shows that diet D had the highest weight compared to others and diet B is significantly (P<0.05) higher than diet C while diet A has the lowest weight gain. However, a significantly (P<0.05) higher different was recorded in the daily feed intake of diet D compared to others. Similarly, a significant (P<0.05) difference was observed between diet B and C with the former having a higher value, diet A the control was the least consumed. Furthermore, the results of the feed conversion efficiency revealed that as the level of Ziziphus Mauritiana leaf was increased in the diets lower values were obtained. This indicates that supplementation with the test ingredient increases the efficiency with which the diets were utilized.

Table 4. Growth performance of growing rabbits fed graded of *Ziziphus mauritiana* leaves in diets

	Diets				
Parameter	**A**	**B**	**C**	**D**	**LSD**
Initial Weight (g)	36.0^{a}	500.0^{a}	620.0^{b}	482.0^{b}	62.00
Final weight (g)	790^{a}	1099^{b}	1090^{b}	1130^{c}	96.4
Total weight (g)	436^{a}	590.0^{a}	470.0^{ab}	649.0^{c}	63.5
Daily Feed Intake	106.43^{c}	110.71^{bc}	118.86^{ab}	124.86^{a}	11.103
Feed conversion efficiency	0.64	0.59	0.42	0.41	0.49^{s}

a, b, c, means in the same the row with different superscript are significantly (P< 0.05) different; LSD =least significant differences.

The results of weight gain of the growing rabbits fed varying levels of Ziziphus mauritiana leaf supplemented diet in this study showed appreciable difference with values obtained from previous findings (Aduku and Olukosi, 1990, Akinmutini, 2004, and Ojebiyi et al; 2008). The result of the current study showed a higher final weight. The result is however lower than that of Owen, (1976). The difference observed may be due to the utilization of varying ingredients, mode of feeding and place of the feeding trails. The trend in the total weight gain of the experimental animals also showed similar trend. The values obtained in this study are higher than those of other researchers (Amuefele et al; 2004, Biobaku et al., 2003, and Cheese et al 1990). It is however lower than that of Aduku and Olukosi (1990), The differences may be due to the effect of randomization, temperature and ratios of concentrates to the experimental test feed ingredient. Similar trend in weight gain was however observed by Ezea (2004) who fed Verona leaf meal to rabbits in diets. Omole and Onwudike (1983), Aduku (1988), Adeosun (2005) and Arneta and Bratt, (2008) also reported similar findingss as that of this study. The result of feed in take showed a wide variation in this study. This is in agreement with the finding of Adeosun (2005) and Akinmutini et al., (2008) with 96.08 - 146.57g per day much higher than 48.79, 78.2 and 67.0g variation was reported by Aduku et als (1986) when groundnut and cowpea haulms were included at varying levels in the diets of weaner rabbits. The value of feed intake of 79.5g per head per day obtained by Otaru (1994) was appreciably lower that the result of the current study probably because Mucuna was fed at a higher ratio (75:25g). Akinmutumi et al., (2008) also fed Mucuna, Lablab or groundnut haulms and obtained lower value of 36.5g. Growing rabbits were similarly fed soybeans cheese waste meal and Lablab by Akinmutumi (2004) in diets and a range of 96.95 - 118.95g per day were obtained. The variation observed in the studies reviewed may be due to the fibre levels in the experimental diets. The trend in the feed conversion efficiency of growing rabbits in the current study was similar to that reported by Biobaku and Oladipo (2002) when cooked Leucaena leaf was fed in the diets Rabbit in both experiments showed better utilization of the diets as the experimental test ingredient Ziziphus mauritiana and Leucana leaf were increased.

CONCLUSIONS

In conclusion, it is an evident from the result of this study that cross bred growing rabbits can tolerate and perform very well on diet D with 45% *Ziziphus mauritiana* leaf. Considering the growth performance, daily weight gain, feed conversion efficiency and feed intake diet D is therefore recommended for growing rabbits.

REFERENCE

Adeosun Y. (2005) The effect of concentrate to forge Stylosanthes hamata combination on reproductive performance of Rabbits Does B. Agric Thesis University of Agriculture, Ibadan.

Aduku, A. 0. and Olukosi, J. 0. (1986). Evaluation of cowpea and peanut Haulms as Feeding stuffs weaning Rabbits in Tropical Environment (Nigeria). J. App!. Rabbit Research, 9(4); 178-180.

Aduku, A.O (1988) Nutritional and Economic value of Rabbit Meat And by products. Paper presented on the National Production Seminar. A.B.U. Zaria.

Aduku, A.O Olukosi J.O (1990) Rabbit mangement in the tropics 1* edition, living books series G.U. Publishers Abuja Nigeria.

Aduku, A.O, and Olukosi, J.O (1990) Rabbit Management in the Tropics: Production, Processing, Utilization, Marketing, Economic research and Future Prospects Living Book series Abuja pp: 20 – 22

Aduku, A.O, DIM, N.J and Hassan, I.B (1989); Tropical forage studies with Rabbits 7The journals of Applied Rabbit Research, 12 (2): 17- 20

Aduku, A.O, Okoh, P.N, Njoku P.C, Aganga, A.A, Dim, N.J (1986) Evaluation of cowpea Vigna unguiculata and pea nut Arachis hypogea haulms as feed stuff for weaning rabbits in a tropical environment (NigeriA). Journal of Applied Rabbit Research 9 (4): 178-180

Akinlade J.A, Aderinola O.A and Rafiv T.A (2006) Effect of quantitative concentrate reduction on the growing of weaner Rabbits pg 121 - 125.

Akinmutumi A.H, Abaslekong, S.F and Ekwu, U.S (2008) The effects of forage to concentrate ratios on the performance of weaner Rabbits. College of Animal Science and Health Michael Okpara University of Agriculture Umudike. 13 annual conference. Of Rabbit production.

Amuefule K.U. Nwaokoro C.C and Iheukwu mere F.C. (2004) The effect of feeding graded levels of raw pigeon pea seed Cajamıs cajans meal on the performance nutrient retention and carcass characteristics of weaner rabbits Nigerian Journal of Animal Production vol 31(2): 194-199s

Arneta, 1.A, and Bratt, L. (2008). Crude Protein and Energy Requirement of Rabbits in the Tropics. Nig. J. Agric. Sci. I:113-117.

Asuquo, B.O (1993), Optimum Mash Level In a mixed Mash, Forage Feeding. Research, 13 (2): 99- 104.

Biobaku, W.0 and Oladipo, O.0; (2002), Determination of optimum methionine and lysine requirements for growing rabbits production. Annual,Conference of Animal Science Association of Nigeria (ASAN) Univ of Abeokuta Nigeria, pp 101- 103.

Biobaku, W.O, Bangbose, A.M; and Achike, C.U (2003), Utilization of different protein sources for growing rabbits J. Tsropical Agric Science 26:73-77

Butcher, C; Bryant, M.J and Owen, E. (1981). Effect of Metabolizable Energy Concentration on Performance and Digestibility in Growing Rabbits Tropical Animal Production. 6:93 -100.

Champe K.A. and Maurice, D.V; (1983), Research Review on Response of Early Weaned Rabbits to Source and Level of dietary Fibre. J. Appl. Rabbit Res. 6(2): 64-67.

Cheeke, P.R (1984) Rabbit Nutrition and Feeding: Recent Advances And Future Perspectives. Journal of Applied Rabbits Research 7(1):31-37.

Cheeke, P.R (1986) Potentials of Rabbits production in tropical and sub tropical Agricultural systems. Journal of Animal Sci 63(5), 1581-1586.

Cheeke, P.R and Patton, M.A; (1986),Fibre Digestion and UtiliZation In Rabbit. Journal of Aplied Rabbits Research 12(2):66-70.

Cheeke, P.R Patton, N.M. Lukefahr, S.D and Monitt, J.I (1987). Rabbit Production. 6th edition.S Interstate Printers and Publishers.Inc Danville, Illinois, U.S.A.

Cheeke, P.R, Grobner, M.A and Patton, N.M; (1996). Fibre digestion and Utilization in Rabbits. Journal of Applied Rabbita Research 13.(1): 25-30.

Cheeke, P.R. (1983). Rabbit Production In Indonesia. J. Appl. Rabbit Res. 6:80 -86.

Cheese P.R (1990) Rabbit nutrition and feeding recent advances and future perspectives Journal of Appl. Rabbit Research 5(1):25-30.

Crower, L.V and Chedda, H.R; (1982). Tropical Grassland Husbandry. Longman, Group Ltd, London.

De Bias, J.C, Santoma G., Rosa C. and Maria J.F (1986). Fibre and Starch Level in fattening rabbit's Diets. J. Anim Sci. 63: 1897-1904.

Deshmukh, S. V, Patton, N.M, and Johari, S.B; (1990). A note on the Nutrional evaluation of pre-flowering Oat Avena sativa Forage for rabbits, Journal of App. Rabbit Research 1(2) :93-94.

Doma, U.D, Adegbola, T.A, Bamgbose, A.M, and Umeh, P.A (The Utilization of Cowpea shell and Maize cobs in diets for rabbits. Tropical Journal of Animal Science. Animal ScienceAssociation of Nigeria,. 2(1): 31-33

Ekpanyong, T. E. (1986). Nutrient composition of Tropical Feedstuff available fir rabbit Feeding. J. Appi. Rabbit. Res. 9: 100-102.

Ekpenyong, T.E and Biobaku, W.O; (1986) Growth response of rabbit feed activated sewage sludge and dried poultry waste Journals of Applied Rabbit Research 9 (1):14-16.

Ekpenyong, T.E. (1986). Nutrient composition of tropical feedstuff Available for rabbit feeding. J. Journals of Applied Rabbit Research. 9: 100 - 102.

Eshiett, N. Omelet, T.A and Adegbola, A.A (1979). Crude protein and Energy Requirement of Rabbits in the tropics. Nigeria Journals of Agriculture Science. 1: 113- 117.

Ezea J. (2004) Effects of graded levels of toasted Lima bean Phaseolus lanatus meal in weaner rabbits diets, B. Agric Thesis College of Animal Science and Health, micheal Okpara University of Agriculture,Umudike.

F. A. 0. (1993). Food and Agriculture Organization of the United Nations Production Year Book Vol. 47. Rome, Italy pp 187-196. FA.O (1993). Food and Agricultural Organization of the United Nations Production Year Book 47: 187 196, FAO Rome, Italy.

FAO (1978) Food and Agricultural Organisation Production Year Book, FAO, Rome, Italy.

Fekete, S. (1987). The new Hungerian system for the evaluation of feed energy Proceeding of 1* North American Rabbit Congress, Oct.10 -13, Portland or U.S.A Pp, 68 -76.

Fernandez, C, and M.J Fraga (1996). The effects of Dietary Fat Inclution on Growth carcass characteristics and Chemical Composition of Rabbits. Journal of Animal Science. 74: 2088 - 2094.

for Broiler chicken PhD Thesis College of Animal Science and Health, MichAkinmutumi A.H (2004) Evaluation of sword Bean Canavalia gladiata as an alternative feed Resources ael Okpara University of Agriculture Umudike.

Ibeawuchi J.A and Fajuyintan A.D (1986). The rabbit industry as source of meat for human consumption. Nigeria livestock Farmer 6:26-27.

Ismail Y.S (2002) Chemical composition of some plant used as feed for Rabbits in Maiduguri metropolis. Thesis.

Iyeghe- Erakpotobor, G.I, Aliyu R.and Ujuru J.(2003). Evaluation of concentrate Grass and Legume combination on performance and nutrient digestibility of grower rabbits under tropical conditions, African Journal of biotechnology 4(20):2004-2008.

Iyeghe- Erakpotobor, G.J Abdulmalik M.E, Uguru J.O Abeke F.O (2002) determination of optimum concentrate and forage combination for small holder feeding of rabbits, Tropical journal of Animal Science 5(1): 181- 187.

Iyeghe- Eraktopobor, G,: 46-52.

Jezkova, Z and Petz R. (1976). Effect of Experimental Stress on Immunological Reactions In Experimental Atherosclerosis of Rabbits. Nutr. Abstr. Rev. 46:22-35.

KNARDA (2001), Agricultural and Rural Development Authority Metrological Station Reports Temperature of Record Book and Management Unit No, 11:1-3.

Lebas, F. (1980). Researches on Rabbit Feeding and Nutrition. Evaluation during the last 20 years and development in the futute. Proc. J wrid. Rabbit Congress 2:1-6. Barcelona, Spain.

Lebas, F., Courdert, P. Rouvier, R. and Chambeau H. (1986) The Rabbit husbandry, Health and production of Food and Agricultural Organization of the United National Animal production and Healthseries No,2 1, Rome Italy.

Lebas, F.C. Counder R. Rochambean LI and Bault R.G (1997). TheRabbit husbandry, health and production FAO of the United Nations Rome, Italy pp, 1 – 10

Licois, D., Coudert, P. and Cohn M. (1980). Essaid induction de la diarrhea chez lelapareau a' 1' aide d 'aliments comportal differences tenures entrepreneur cellulose. Anm. Rech. Vet. 10: 279-284.

Lukefahr S.D. and Cheeke P.R (1991) Rabbit project development strategies in subsistence farming system 2. Research application, World Animal Review 69(4):26-35.

Lukefahr, S.D andGoldman, M. (1985). A Technical Assessment at Production and Economic Aspect of Small scale rabbit farming In Cameroon. Journal of Applied Rabbits Research 8:126-135.

Lukefahr, S.D, Nwosu, C.V, and Rao, D.R (1989). Cholesterol level of rabbit meat and trait relationships among growth, carcass and lean yield performances. Journal of App. Rabbit Research 13 (1):33- 35

McDonald, R.A Edwards, J.B, and Greenhalah, J.D (1988) Animal nutrition, Long man group U.K Ltd, London.s

Nworgu F.C Egbinike G.N Abu OA, Fapo hunda, J.B Omale A.J (1990) Effect of concentrate and leaf meal on performance of Rabbits. Asan Publishers, Nigeria.

Nworgu, F.C Olupona, J.A Oluokun, J.A and Bamgbose, A.M (1998).Effects of Concentrate and Forage Lagumes on Weaner rabbit Performance. In: Animal Agriculture in West Africa (The Sustainability Question). Proceeding of 25h Anmual Conference of Nigerian Society for NSAP held at Hotel, Abeokuta Nigeria, 21-26h March (Oduguwa, O.0, Fanimo, A.O and Osinowo, O.A Eds),598-599

Ojebiyi 0.0 Fanny, G.O Oladunjoye, LO, and Togun, V.A (2008) Comparative study on the effect of forms of diet presentation on the performance of cross-bred rabbits. Proceeding of the

33d Anmual conference of Nigerian Society for Animal production (NSAP) 16"- 20h March Olabisi Ongbanjo University, Ogun State Nigeria pg 145 -147.

Omole LA. and Onwudike O.0 (1983) Effect on palm oil on the use of Cassava peel meal by Rabbits Tropical Animal Production 2(2): 27-32.

Omole, J.A Adeyuyigbe A. Ajayi F.T and Fapohunda J.B (2007) Nutritive value of Stylosanthes guineensis and Lablab- purpurens as sole feed for growing Rabbits Africa Journals of Biotecnology 6(18):2171-2173.

Onwudike, O.C (1995). Use of the legumes tree crops Gliricidia Sepium and Leuceana leucocephala as green feeds forgrowing rabbits. Animal Feed Science and Technology.51: 153-163.

Otaru, R.A (1994). Degradability in the Rumen from Incubation Measurements Weighted According to Rate of Passage. Journal Of Agriculture science. 92:499-502

Owen J.E (1976) Rabbit production in tropical developing countries Tropical Sci, 18:209- 210.

Oyawoye, E.O (1989), Rabbit production as means of supplementing cheap animal protein in Nigeria. Journal of NURI, NAERLS, and NAPPRI 9:1 -4.

Oyawoye, E.O and F.S Nelson (1998). Utilization of grade levels of rice Offal by rabbits. Proceedings of the Silver Anniversary Conference for West Africa Society of Animal Production. (WASP) 21-26 March Pp. 143-144.

Partridge G.G (1989) Nutrition of farmed Rabbits Proceeding of the Nutrition Society.Research 11(2):3-4

Partridge, G.G,and Kindly, R.A (1980) Fat supplementation of diet for growing rabbit Animal. Feed Science and Technology 10: 109- 111.

Partridges, G.G Findlay, M.A. and Fordyce, R.A (1986).Fat Supplementation of diet for growing rabbits Animal Feed Science Technology. 16:109.

Peters J. E. and Charlier 0. T. (1984). Le Complexe Enterite Dii Lapin De Chair Entrepreneur Elerage Rational. Cuniculture Sci. 2: 13-26.

Raharjo, Y.C, Cheeks, P.R and Patton, M.N (1990). Evaluation of rice Hulls as fibre source for weaner rabbits. Journals of Applied Rabbits Research 13 (1) :10-12

Ranjhan, S.K (1980) Animal nutrition in the Tropical, Vikas publishing House P VT Ltd. Ghaziabad, India.

Rao, D.R, Chawan, C.B, Chen, C.P and Sunki, G.R (1979). Nutritive value of Rabbit Meat in. The Domestic Rabbit, Potentials Problems and Current Research. Oregon State University Rabbit Res. Corv. USA 112- 113.

Umaru, M. (1987). Rabbit as meat. Proceedings of livestock and Veterinary Conference Jointly Organised by NAERLS and NAPRI, Pp. 61-64.