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Effect of Yam Peel Meal (YPM) Replacement for Maize on the Growth Performance and Carcass Traits of Weaner Rabbits

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Abstract – **A 56 days feeding trial was conducted with 27 weaner rabbits to evaluate the performance of rabbits fed Yam Peel Meal (YPM) as replacement for maize. The rabbits were randomly allocated into three treatment groups in a complete randomizes design. Each treatment was replicated three times having three rabbits per replicate. Three experimental diets were formulated with YPM at varying levels of replacement. The replacement level of YPM was 0% (50%maize), 50% (25%maize) and 100% (0%maize) representing T_1, T_2 and T_3, respectively. Each of the diets was offered *ad libitum* to the rabbits. Parameters measured included, weight gain, feed conversion ratio, carcass characteristics, and economics of production. Carcass analysis was done at the 56th day. Cost implication of replacing maize with YPM was calculated at the end of the experiment. The result showed a non significant (P > 0.05) difference in the body weight and feed conversion ratio among treatments. There were significant (P<0.05) differences in the fed intake of the rabbits. Rabbits fed T_2 and T_3 diets consumed significantly more feed than rabbits fed T_1 diets. There was no significant (P > 0.05) difference for all the parameters considered for carcass traits, with the exception of kidney. There was a significant (P<0.05) difference in all the parameter measured in the cost implication except in the revenue and in the benefit. T_3 has the least cost/Kg feed, cost/Kg feed intake, cost/Kg weight gain, total cost and cost-benefit ratio. Thus the inclusion of YPM in diets up to 100% had no adverse effect on the performance, and carcass characteristics of the animal. Result also showed that replacement of maize with yam peel meal caused a significant (P < 0.05) reduction in the cost of feed/kg weight gain of rabbit.**

Keywords – **Yam Peel Meal (YPM), Weaner Rabbits, Carcass Traits, Growth Performance.**

I. INTRODUCTION

The third world countries, including Nigeria are afflicted with malnutrition, especially with regard to inadequate intake of various nutrients, such as protein and calories (Oluyemi and Ologhobo, 1998). In Nigeria, low animal protein intake has remained a major nutritional problem, especially for the low income and non-wage earners (Amaefule and Obioha, 2005; Akinola, 2009). Average consumption of animal protein in Nigeria is estimated at 8g/head/day as against a minimum requirement of 35g/head/day recommended by the Food and Agricultural Organisation of the United Nations (Atsu, 2002). This falls short of the FAO's recommended daily intake of 30g per caput per day (Dafwang, 2009).

Researches have shown that the low level of animal protein intake by Nigerians has generated concern as it affects both the physical and mental development of youths and labour force in Nigeria. One way of solving this problem is by focusing on production of animals with high rate of production and growth (Akinmutimi and Onen, 2008)

Animal protein is obtained from various animals. One of such animals is the rabbit which is rich in protein (20.8%) and low in fat (10.2%) than other meat species (Bayman, 1984). Meanwhile rabbit requires 17-18%CP, 10-12%CF, 2-5%fat and 2100-2200ME Kcal/Kg for growth performance (Amy, 2010). The rabbits' rapid rate of production with short gestation period of 28-32days has made its production a wise choice for Nigerians as a means of alleviation protein food shortages (Akinmutimi and Anakebe, 2008). In recent years, interest in rabbit production in Nigeria has increased dramatically (Anya *et al.*, 2010). The potential of rabbit production in alleviating the low animal protein intake in Nigeria and other developing countries especially those in sub-Saharan Africa needs no emphasis (Amaefule *et al.*, 2005). Moreso, there are no religious taboos preventing their production and consumsption unlike pigs (Ayuk *et al.*, 2009). They are also characterized by low capital requirement and quick return.

The problem of animal protein scarcity in Nigeria and other developing nations has attained a deplorable status which calls for urgent remedy to avert the imminent protein malnutrition (Ekenyem *et. al.,* 2006). This problem has been blamed on high cost of conventional ingredients for feed making which has made monogastric animal feed a major cost in production (Agbakoba *et al.,* 1995).

Ogunfowora (1984); Akinmutimi (2001); Madubuike and Ekenyam (2001); Faniyi (2002); Akinmutimi and Anakebe (2008) had rated feeds as constituting 70-80% of the total cost of animal production in Nigeria. This has been attributed to escalating prices of conventional feed ingredients especially the energy sources such as maize, sorghum etc. (Akinmutimi, 2006). This has brought about the quest to search for alternative feedstuffs.

Yam peel (*Dioscorea rotundata*) is one of the various farm wastes that has such potentials (Adeyemo and Borrie, 2002). Yam peel is cheaply available in Nigeria (Akinmutimi *et al.,* 2006). White yam peels consist of 11% crude protein with metabolizable energy of 2604kcal/g (Eka, 1995 and Akanno, 1998). *Dioscorea rotundata* peels are rich in amino acid (Eka, 1985). Yam peel as described by Akinmutimi and Onen (2008) contains 12.70%CP, 6.30%CF and gross energy/kcal/g of 2.98.

The use of Yam peel meal for animal feed will help in reducing the competition between man and animal for the less available grains and will harness the efficient and effective use of yam peel waste.

The study was carried out to determine the growth response of weaner rabbits to dietary levels of yam peel meal (YPM), to assess the effect of YPM on the carcass traits of the animals and to determine the economic value of replacing maize with YPM in rabbit production.

II. Materials and Methods

Experimental Site

The trial was carried out at the Rabbitry Unit of the Department of Animal Science Farm, Faculty of Agriculture, Ebonyi State University, Abakaliki.

Preparation of Yam Peel Meal (YPM)

Yam peels were collected fresh from Kitchens, yam processing centers and partially spoilt yams from yam barns. The peels were dehydrated by sun-drying for 4-7days to reduce enzymatic and microbial reactions leading to spoilage and nutrient leaching. The sun drying was also aimed at enhancing the crispness and to reduce anti-nutritional factors such as tannin, saponin, oxalate and phytate present in yam. The dry peels were then milled in a hammer mill before incorporating into the test diets.

Chemical Analysis of Yam Peel Meal

A sample of the test ingredient (YPM) and dietary treatments was collected and analyzed for proximate composition and gross energy according to A.O.A.C (2000) at the Central Laboratory Unit of the National Animal Production Research Institute, ABU/Shika, Zaria, Kaduna State. Table 5 shows the proximate composition of YPM. Metabolizable energy was calculated using Onu and Oboke (2010) formula: ME = 35 x %CP + 81.8 x %EE + 35.5 x NFE. NFE was calculated using Shaahu *et al.* (2011) formula: %NFE = 100 – (%EE + %CP + %CF + %Ash).

Experimental Diet

Three experimental diets were formulated such that diet 1 (0% YPM) had 50% maize (control) while the test ingredient (YPM) replaced maize at 50%, and 100% in the diets 2, 3 respectively. Table 2 and 3 show the ingredient composition of experimental diets and the proximate composition of the diets, respectively.

Experimental Rabbits and Management

A total of 27, 6 weeks old rabbits were obtained from Federal College of Agriculture, Ishiagu. The rabbits were randomly assigned into 3 experimental treatments designated as T_1, T_2 and T_3 with each treatment having 9 rabbits. Each treatment was replicated 3 times with 3 rabbits per replicate. Clean drinking water and experimental diets was administered *ad libitum*. Prior to the commencement of the experiment, the animals were weighed to obtain their initial body weights. Other routine management procedures were observed for the period of 8 weeks (56days).

Parameter Evaluation

Growth Performance: Data were collected as follows:

- *Weight gain*

The rabbits were weighed before introducing them into the treatments to obtain the Initial Live Weight (ILW) of each rabbit/ replicate. Subsequently, the rabbits were weighed on weekly basis to obtain their weights. The Body Weight Gains (BWG) was obtained by subtracting the Initial Body Weight (IBW) from the Final Weight (FW). Daily Weight Gain (DWG) was obtained by dividing the Total Body Weight Gain (TBWG) by the number of days the experiment lasted.

BWG = Final weight – Initial Body Weight

$$\text{Average Weight Gain} = \frac{\text{Total Weight Gain}}{\text{Number of Animal}}$$

$$\text{DWG} = \frac{\text{Total Body Weight Gain}}{56 \text{ days}}$$

- *Feed Intake/Rabbit/Day (g)*

The quantity of feed to be served was weighed and the leftover collected and weighed. Feed intake was determined by subtracting the leftover feed (LF) from the quantity of feed served (QFS). The daily feed intake (DFI) was determined by dividing the total feed Consumed (TFC) by the Number of Days the experiment lasted. The Average Feed Intake (AFI) was determined by dividing the Total Feed Consumed by the Number of Animals.

FI = Quantity of feed served – Leftover feed

$$\text{DFI} = \frac{\text{Total Feed Consumed}}{56 \text{ days}}$$

$$\text{AFI} = \frac{\text{Total Feed Consumed}}{\text{Number of Animal}}$$

- *Feed Conversion Ratio (FCR)*

This was determined by dividing the Average Daily Feed Intake by the Average Daily Weight Gain.

$$\text{FCR} = \frac{\text{Quantity of Feed Consumed}}{\text{Weight Gain}}$$

Evaluation of Carcass Traits

Carcass trait was carried out as described by Ayoola and Akinbani (2011). This involves the random selection of 1 rabbit from each replicate (rabbits closest in mean weight/replicate) making a total of 9 rabbits. The selected rabbits were weighed, fasted overnight and re-weighed prior to slaughtering. The animals were thoroughly bled by hanging them head down through the hind legs on nail. Furs were removed by roasting to get the dressed weight. Then the carcass was dissected and the internal organs evacuated (to get the eviscerated weight).

The carcass was then dissembled into wholesale cuts and each primal part (head, neck, forelimbs, hind limbs and Back-cut) was weighed using a weighing scale. The organ weights (lungs, stomach, heart, kidney, liver and intestine) were taken. Each of the parts and organs was expressed as percentage of the dressed weight.

Cost Implication

This shows the profitability of the test diet. It was calculated using the method of Sonaiya *et al.* (1986). Where the economic benefit of replacing yam peel for maize in the diet of weaner rabbits was assessed by obtaining the Cost (₦)/kg Feed, Total Cost (₦), Revenue,

Benefit and Cost-benefit Ratio for each experimental diet using the following formulae:

Cost (₦)/Kg feed intake = Feed Cost (₦)/Kg x Total feed intake

$$\text{Cost (₦)/Kg Weight gain} = \frac{\text{Total Feed Cost (₦)}}{\text{Kg Weight Gain/Rabbit}}$$

Total Cost = Cost of Feed Intake/Rabbit/Treatment + Miscellaneous

Revenue = Cost of Live Rabbit

Benefit = Total Revenue – Total Cost

$$\text{Cost-Benefit Ratio} = \frac{\text{Total Cost}}{\text{Benefit (gain)}}$$

Data Analysis

Data collected were subjected to Analysis of Variance (ANOVA) according to Okporie (2006) and significant means were separated using Fishers Least Significant Difference (F-LSD) according to Fishers (1948).

III. Results

Growth Performance Traits

Table 4 shows the summary of the growth performance traits of rabbits fed yam peel meal as replacement for maize.

There were no significant (P>0.05) differences in all the parameters measured except for the total feed intake and the daily feed intake which showed a significant (P<0.05) difference.

Carcass Trait Evaluation

Table 5 shows the mean weight of carcass traits of rabbits fed different levels of YPM inclusion in the experimental diets. Each of the weights (traits) was expressed as a percentage of the dressed weight.

There was no significant (P>0.05) difference in the carcass traits except in the kidney weight which did not follow any known cause.

Cost Implication

Table 6 shows the cost implication of replacing maize with YPM in weaners rabbit diets.

There was a significant (P<0.05) difference in the cost (₦)/kg feed, cost(₦)/kg feed intake, cost (₦)/Kg weight gain, total cost(₦) of production and cost-benefit ratio. There was no significant (P>0.05) difference in the revenue, benefit (gain) and in the cost-benefit ratio.

IV. Discussion

Proximate Composition of YPM and Experimental Diets

The proximate composition of YPM and experimental diets are presented in Tables 1 and 3 respectively. The values were closely related to the reports of Ekenyem *et al.* (2006); Akinmutimi and Onen (2008) and Maliki *et al.* (2011) and fall within the nutritent requirements of growing rabbit as recommended by Omole *et al.* (2005) and Akinmutimi (2006).

The CP content of YPM (12.69%) is in accordance with Akinmutimi and Onen (2008) who reported 12.70%CP for YPM. The CF content (7.78%) and Ash (8.41%) are slightly lower than 8.40% and 9.30% as reported by Ekenyem (2006) and Akinmutimi and Onen (2008) respectively. These variations maybe due to different source of YPM (Akinmutimi, 2004) and soil as a limiting factor (Obiona *et al.,* 2011). The NFE values of, 55.53% implies that YPM has a high level of soluble carbohydrate and will enhance palatability and therefore, increase feed intake and digestibility. The MEkcal/kg (3690.73) of the test ingredient is higher than what was obtained (2604 kcal/kg) by Akanno (1998)

The proximate composition of experimental diets reveals that, diets were formulated according to the standard of Carew *et al.* (2007); Onu and Oboke (2010) and Nsa *et al.* (2011). The values were closely related to the calculated values and they all fall within the nutrient requirement of rabbit especially the CP and energy values. Nsa *et al.* (2011) reported a 16.90 – 17.91%CP while Amy (2010) reported 17 – 18%CP requirement for rabbit. The %CF (5.29 – 8.18) is lower than 16.80 – 17.80% as reported by Njoku *et al.* (2011) in their work with sorghum milling dust used in weaners rabbit diet.

The CP, CF, Ash and EE increased as the level of YPM inclusion increased while the NFE and MEkcal/kg decreased as the level of YPM increased.

Growth Performance

The growth performance of weaner rabbits fed different levels of YPM is presented in Table 4. Statistically, there were no significant (P>0.05) differences in the parameters measured, except in the total feed and daily feed intake where T_3 were significantly higher than T_2 and T_1. This is to show that, all the diets were similar and any of them could be recommended.

However, there was a numeric increase in the final body weight as the level of YPM increased. This probably indicates that replacing up to 100% of the maize in the diet with YPM has no deleterious effect on the weight gains of the rabbits. This also implies an effective utilization of the feed nutrients by the rabbits. This observation is in line with the report of Ayoola and Akinbani (2011) who reported an inclusion level of 100% when maize made up to 32% of the entire diet. However, it disagrees with Iyaji (2001) who reported that an additional level of fibre in the diet of animals depresses weight gain. The body weight gain and daily weight gains of rabbits fed diets containing YPM were higher than that of T_1 numerically, but the difference was not significant.

There were significant (P<0.05) differences in the total feed intake and the daily feed intake with T_3 having the highest value. This could be as a result of increasing fibre content. This is particularly in agreement with Cheeke and Amberg (1972) who opined that increased crude fibre resulted in increased voluntary feed intake in growing rabbit as a means of compensating for feed. The observation also agrees with the report of Esonu *et al.* (2003) that inclusion of a fibrous material had an energy dilution effect on feed and consequentially increases feed intake. Contrary to this is Kass *et al.* (1980) and Ani (2007) who reported that a high dietary fibre level depressed nutrient intake in animals.

There was no significant (P>0.05) difference in the feed conversion ratio (FCR). This could be as a result of depressive effect of the dietary fibre on the utilization of nutrients. This confirms the report of Ani (2007) that a dietary fibre exerted its depressive effect on nutrient intake by causing early gut-fill, since fibrous feeds tends to spend a longtime in the digestive tract thereby resulting in reduced nutrient intake (MacDonal *et al.*, 1995)

Carcass Evaluation

The values of wholesale parts and organs of rabbit fed different levels of YPM are as shown in Table 5. There were no significant (P>0.05) difference in all the parameters evaluated with the exception of the kidney which did not follow any specific pattern. This agrees with the report of Van (2004). This implies that the diets had no adverse effect on the carcass traits of rabbit. It is believed that, if there is any major effect of anti-nutritional factors, organs like liver and heart should be significantly affected (Ukachukwu, 2006; Akinmutimi, 2004; Akinmutimi and Anakebe, 2008), since the kidney, liver and heart are the major detoxification organs (Ukachukwu, 2000).

The rabbit fed diet containing YPM had a greater numeric increase in their dressed weight and stomach weight. This could be attributed to gut-fill which follows an increasing level of YPM inclusion in the diets.

Cost Implication of Replacing Maize with YPM

The economic effect of replacing maize with YPM in weaners rabbit diet is presented in Table 6. There were significant differences (P<0.05) among treatments for the Cost (₦)/Kg feed intake. Cost of feed intake/rabbit ranged from ₦158.42 to ₦264.67 with T_1 having the highest cost and T_3 having the least cost. This implies that increasing level of YPM resulted to a considerable reduction in the cost of rabbit production.

Significant difference (P<0.05) also existed among the treatment on cost (₦)/Kg feed and with T_3 (₦ 35.94) having the most favorable value. This is because YPM has no commercial value as compared to maize. This confirms a similar report by Akinmutimi and Onen (2008) who worked with YPM on broiler finisher. The cost (₦)/Kg weight gain (₦1294.97 to ₦1952.63) was significantly (P>0.05) lower in diets containing YPM when compared to ₦2880.18 obtained from the diet containing 0% YPM. This indicates that inclusion of YPM in the diet helped in the reduction of cost of production. The decrease in cost of feed/Kg weight gain in the diets containing YPM might have resulted from the zero cost value placed on YPM at present. This observation is in agreement with the findings of Igwebuike *et al.* (2009) who reported a decrease in feed cost (₦)/Kg weight gain with dietary replacement of costly ingredients with cheaper ones. There was also a significant (P<0.05) difference among treatment for the total cost of production.

There was no significant (P>0.05) difference in the revenues and benefits of the treatments, although, numerically, T_2 and T_3 had the highest value which maybe due to difference that existed in cost/Kg weight gain. This implies that, increasing level of YPM in rabbit diets increased revenue and benefits. Moreover, there was a significant difference (P<0.05) in the cost-benefit ratio with T_3 having the least value (0.14) followed by T_2 (0.16). This implies that for every 0.1 unit cost expended, there must be benefit. It therefore, followed that, T_3 was the best diet from economic point of view. This confirms the report of Amaefule *et al.* (2004) who gave a similar report in a study conducted with raw pigeon pea seed as a substitute for soybean in the diets of rabbit.

V. Conclusion and Recommendation

The sole aim of venturing into animal production by producers is to make profit with a reduced cost. Yam peel meal is abundant in supply and cheap, and therefore, can be used to reduce cost of production without any adverse effect on the performance of the animals at up to 100% replacement for maize.

It is therefore, recommended that this farm waste (YPM) be fed to rabbit to improve productivity.

References

[1] A.O.A.C., (2000). Official Methods of Analysis, 17th edition. Association of Official Analytical Chemists, Washington D.C., USA

[2] Abdel-Magid, S.S., Ghazalah, A.A., and Soliman, M.S., (2005). Nutritional Studies on Leguminous Straw in Feeding Growing Rabbits. Ph.D. Thesis, Fac. of Agric., Cairo Univ., Egypt, 144 pp. 22201 USA. Pp. 167-173.

[3] Seed meal. *Livestock Res. Rur. Dev*. Vol. 17 pp 48.

[4] Amakiri, A. O., Owen, O. J., and Udenze, C. N., (2011). Comparative Study of the Nutritional Value of Two Pasture Grasses: *Panicum maximum* (Guinea grass) and *Pannisetum purpureum* (Elephant grass) Using Weaner Rabbits. Proc. 36th Conf., Nig. Soc. for Anim. Prod. 13-16 March, 2011, Univ. of Abuja, Nigeria. Pp. 302-303.

[5] Amy, E. H., (2010). Nutritional Requirement for Rabbits. Monogastric Nutritionist Shur-Gain, Nutieco Canada Inc. Pg 2-4

[6] Ani, A. O., (2007). Nutrient intake, Digestibility and Utilization by Rabbits fed graded levels of Raw Bambaranut (*Voandzeia subterranean* L.) waste. Proceedings of the 32nd Annual Conference of the Nigerian Society for Animal Production – Calabar, March 18-21, 2007. Pp. 282-286.

[7] Bamgbose, A. M., Oso, O. A., Adeyanju, A., Yusuff, S., Lala, O., and Olayemi, W., (2011). Performance of grower Rabbits fed Newsprint waste as partial Replacement for maize. Proc. 36th Conf., Nig. Soc. for Anim. Prod. 13-16 March, 2011, Univ. of Abuja, Nigeria. Pp. 324-326.

[8] Bayman, A. C., (1984). Composition of Rabbit Meat. *Journal Appraisal. Rabbit Research*, 7: 134.

[9] Bolaji, O. S., (2005). Annual welfare veterinary science. (Handbook). Ibadan: Evans Publishers.

[10] Carew, S. N., Shaahu, D. T., and Ukah, L. I., (2007). Maize and full fat Soyabean Compared as Energy Sources for Rabbits in Low Technology. Proceedings of the 32nd Annual Conference of the Nigerian Society for Animal Production – Calabar, March 18-21, 2007. pp. 464-466.

[11] Cheeke, P.R., (1986). Potentials of Rabbit Production in Tropical and Subtropical Agricultural Systems. *J. Anim. Sci.,* 63, 1581-1586.

[12] Cornelius E. W., and Aduro, K. A., (1999). Storage Diseases of White Yam (*Dioscorea rotundata*, P.): Causes, Varietal Susceptibility and Control. *Journal of the Ghana Science Association*1 (3), 45–52.

[13] CTA Spore, (2008). Rabbits: Breeding Healthy Animals. In: CTA Spore 135: 11.

[14] Dafwang, I. I., (2009). Meat, Eggs and Milk from Farm waste. Explorations in Animal Nutrition Research and Extension (University Organised Lectures Committee 2006-2009).

[15] Debray, L., Huerou-Luron, I. L., Gidenne, T., and Fortun-Lamothe, L., (2003). Digestive tract Development in Rabbit according to the Dietary Energetic Source: Correlation between Whole tract Digestion, Pancreatic and intestinal enzymatic activities. Comparative Biochemistry and Physiology - Part A: Molecular & Integrative Physiology, Vol., 135 (3): 443-455.

[16] Diarra, S. S., Igwebuike, J. U., Kwari, I. D., Sinodo, S., Babangida, A., Ahmadu, U., Shettima, S. and Jibrin, M., (2012). Evaluation of yam-sweet Potato Peels Mixture as source of energy in Broiler Chickens diets. ARPN Journal of Agricultural and Biological Science. Vol. 7, No. 7, July 2012. pp. 497-502

[17] Egoh, J.O., (2008). Growth and Hematological Response of Weaner Rabbits to varying Levels of Crude Protein. M.Sc. Thesis, Department of Animal science and Fisheries, Delta state University Nigeria.

[18] Eka, O. U., (1985). The Chemical Composition of Yam Tubers. In: Advances in Yam Research; The Biochemistry and Technology of Yam Tubers. Osujin Ged. Pub. By Biochemical Society of Nigeria in Collaboration with ASUTECH, Enugu. Pp. 51 – 75.

[19] Ekenyem, B. U., Madubuike, F. N., and Dike O. F., (2006). Effect of Partial Replacement of Yam Peel Meal (*Dioscorea spp*.) for Maize Meal *(Zea mays*) on Performance and Carcass Characteristics of Finisher Broiler Chicks, Asian Network for Scientific Information 2006. *International Journal of Poultry Science* 5(10): 942 – 945.

[20] Ho Thi Lan Huong, (2002). Utilization of Biogas Technology for Generating Electricity and Storing Oranges. In: Proc. International Workshop Research and Development on Use of Biodigesters in SE Asia region, 2002 March, Ho Chi Minh, Vietnam, 70-74. http://www.mekarn.org/procbiod/huong.htm.

[21] Hupp, H. D., and Rathwell, P. J., (1998). Protecting Livestock from Heat Stress. Management Marketing Memo 371, Department of Agricultural and Applied Economics, Clemson University Clemson, SC, 29634 – 0355.

[22] Irekhore, O. T., Akinsoyinu, A. O., and Babatunde, G. M., (2011). Replacement Value of Albizia Saman (Raintree) Pods for Maize in the Diet of Weaner Pigs. Proc. 36th Conf., Nig. Soc. For Anim. Prod. Pp. 418 – 421

[23] Kass, M. L., Van Soest, P. J., Pond, W. G., Lewis, B., and McDowell, R. E., (1980). Utilization of Dietary Fibre from alfalfa by Growing Swine. 1 Apparent digestibility of diet Components in Specific Segments of the Gastro-intestinal tract. J. Anim. Sci. 50: 175-191.

[24] Farming Systems. In Proc.International Workshop Research and Development on Use of Biodigesters in SE Asia region, 2002 March, Ho Chi Minh, Vietnam, 5-11. http://www.mekarn.org/procbiod/prest.htm.

[25] Sayebo, K. O., (2006). Constraints against Wide spread of Rabbit Keeping Among Household in Ogun and Oyo State. Implication of Family Empowerment. J. App, Sci. Res. Pp. 121-124.

Table 1: Proximate composition of Yam Peel Meal (YPM)

Description	%
Dry Matter	87.08
Moisture	12.92
Ash	8.41
Ether Extract	15.59
Crude Fiber	7.78
Nitrogen	2.03
Crude Protein	12.69
NFE	55.53
MEkcal/kg	3690.73

Table 2: Percentage Composition of Experimental Diets

Ingredient	T_1 (0%)	T_2 (50%)	T_3 (100%)
Maize	50.0	25.0	00.0
Yam peel meal	00.0	25.0	50.0
Soya bean meal	16.0	16.0	16.0
Wheat offal	10.0	10.0	10.0
Palm kernel cake	20.0	20.0	20.0
Bone meal	3.5	3.5	3.5
Vit. Premix	0.25	0.25	0.25
Salt	0.25	0.25	0.25
Total	100.0	100.0	100.0

*To provide the following per kg of feed: Vit. A, 10,000IU; Vit B1, 075g; Biotin, 0.05g; Folic acid 1g; Chlorine chloride 250g; Copper, 8g; Manganese, 64g; Iron 32g; Zn 40g; Iodine 0.6g; Flavomycin 100g; Spiramycin 5g; 3-nitre 50g; DL-methionine, 50g; Selenium, 0.6g; Lysine 120g; BHT, 5g; E = Enzyme; P = Probiotic

Table 3: Proximate Composition of Experimental Diets

Description	T_1(%)	T_2(%)	T_3(%)
Dry Matter	89.92	89.25	96.72
Ash	2.39	4.52	6.46
Ether Extract	4.32	7.22	10.12
Crude Fibre	5.29	6.74	8.18
Crude Protein	16.84	17.76	18.69
NFE	71.16	63.86	56.63
MEkcal/kg	3068.96	3079.23	3092.33

Table 4: Performance Traits of Rabbits fed different levels of YPM

Parameter	Levels of YPM Inclusion T_1 (0%)	T_2 (50%)	T_3 (100%)	±SEM
Initial Body Weight (g)	1043.33	1014.33	1073.33	17.03
Final Body Weight (g)	2393.33	2473.33	2486.67	29.15
Body Weight Gain (g)	1350.00	1459.00	1413.33	31.60
Daily Weight Gain (g)	24.11	26.05	25.24	0.57
Total Feed Intake (g)	3440.34^{b}	3895.50^{ab}	4407.50^{a}	279.36
Daily Feed Intake (g)	61.44^{b}	69.56^{ab}	78.71^{a}	4.99
Feed Conversion Ratio	2.55	2.67	3.12	0.17

*a-c means with the same superscript in the same row are not statistically significant (P>0.05). SEM – Standard Error of the Mean

Table 5: Carcass Traits of Rabbits fed Yam Peel Meal as replacement for Maize.

Parameter	Level of YPM Inclusion in the Diets T_1 (0%)	T_2 (50%)	T_3 (100%)	±SEM
Fasted Weight (Kg)	1.81	1.88	1.90	0.027
Dressed Weight (Kg)	1.57	1.59	1.59	0.004
Eviscerated Weight (%)	87.78	84.94	86.75	0.830
Head Weight (%)	18.64	21.22	17.73	1.050
Neck Weight (%)	7.20	5.69	7.52	0.560
Forelimbs (%)	17.81	16.59	16.51	0.421
Hind limbs (%)	19.93	20.19	19.27	0.280
Back cut (%)	24.39	20.81	26.01	1.540
Organ Weight:				
Lungs (%)	1.86	1.89	1.85	0.014
Liver (%)	2.66	3.85	2.56	0.414
Kidney (%)	1.30^{b}	1.45^{ab}	1.59^{a}	0.084
Heart (%)	0.65	1.13	0.63	0.164
Intestine (%)	0.82	0.96	0.82	0.047
Stomach (%)	5.39	6.05	6.10	0.230

*a-c means with same superscript on the same row are not statistically significant (P>0.05). SEM – Standard Error of the Mean.

Cost Implication

Table 6: Cost implication of replacing maize with YPM in weaners rabbit diets.

Parameter	Level of YPM Inclusion in the Diets T_1 (0%)	T_2 (50%)	T_3 (100%)	±SEM
Total Feed Intake (Kg)	3.440	3.896	4.408	0.28
Cost(₦)/Kg feed	76.94^{a}	56.44^{ab}	35.94^{b}	11.84
Cost (₦)/Kg Feed Intake	264.67^{a}	219.86^{a}	158.42^{b}	30.80
Cost (₦)/Kg Weight Gain	2880.18^{a}	1952.63^{b}	1294.97^{c}	459.82
Total Cost (₦)	498.02^{a}	455.17^{a}	391.74^{b}	30.81
Revenue	3103.84	3291.88	3153.05	56.30
Benefit	2605.82	2838.71	2761.31	68.48
Cost-Benefit Ratio	0.19^{a}	0.16^{ab}	0.14^{b}	0.01

*a-c means with same superscript on the same row are not statistically significant (P>0.05)
SEM – Standard Error of the Mean.