Improving Rabbit Production Using Cassava Products as Supplement

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ABSTRACT

This paper presents a study that investigate the difference between the growth effects from two feeds combinations of the usual feed supplement of poultry growers mash with common roughages and the usual main feed supplement from cassava products with common roughages. Sixteen (16) rabbit wearers, six males and 10 females were shared into two hutches (A and B). Hutch "A" formed the control group while hutch "B" formed the experimental group. One null hypothesis was formulated to guide the study. Independent t-test was used to test the hypothesis at .05 level of significance. The findings of the study revealed that there is no significant difference between the weight gains of two groups of rabbits on two different feed stuff. Based on the findings of the study, it was recommended among others that cassava, by products in the South-South Nigeria, should be harnessed and turned to feeding of rabbits for large scale production.

KEYWORDS: Growth of rabbit, usual feed, roughages cum concentrate, poultry feed, cassava products, supplement

Introduction

The shortage of protein particularly of animal origin in human diets in all parts of Africa and most developing countries of the world especially Nigeria cannot be overemphasized. The production of non-ruminant species and indeed rabbits represents the fastest means of correcting the shortage of animal protein in tropical Africa. The animal protein for human consumption in Nigeria (from cattle, pigs, poultry, sheep and goats) has not been able to bridge the gap between the demand and supply. Despite the numerous advantages associated with the consumption of animal protein, the minimum in-take recommended by FAO, (2011) has not been met. This is mostly because price of meat has gone beyond the means of most Nigerians. To ease this problem of low animal protein intake, there should be an expansion in the production of small, highly prolific livestock with rapid turnover rate at a very low cost.

Rabbits have been identified as an economy livestock that could bridge the wide gap in dietary protein intake in Nigeria (Adedeji, Adejumo & Obanigi, 2012). It is a micro-livestock producing about 47kg meat per doe per year, which is enough to solely meet the animal protein requirements of a medium size family under small scale rural farming systems (Ade, et al, 2012). Besides, rabbit meat is rich in vitamin B and extremely low in cholesterol and sodium levels (Jithendran, 2000, Omole, Omueti, Ogunleke, 2005).

Recently, the rabbit has come under focus as an animal with enormous potential because of its attributes such as small body size, short generation interval, high reproductive potentials,

rapid growth rate, genetic diversity and ability to utilize forage. Rabbits as an economic source of high-quality animal protein in the nutrition of human population in much of the tropical region is gradually expanding. The animal is known to be prolific, with high efficiency of transforming feeds into muscle. In Nigeria as most developing countries the daily dietary intake of animal protein (3.24g) falls grossly short of the recommended 27g animal protein per capital/day (FAO, 2011). Rabbit production is suitable because as monogastric herbivores, they do not compete directly with man for both cereal and legume grains. Rabbits are also favoured because of its high fecundity, low cost of investment, short generation interval. The gestation period is about 32 days. The litters are weaned in about 4 – 6 weeks, and the doe is mated again in 3-4 week. A doe could produce 4 -5 liters per year. (Aduku and Olukosi, 1998). They can utilize diverse forages.

As a result of scarcity of cereals posed by high competition with industries and humans, there is need to explore other viable alternatives energy sources. One of such alternatives is cassava products. It is relatively cheaper than cereals and is available all year round. Food and Agriculture Organization (FAO) of the United State (2011) has shown that Nigeria is the world largest producer of cassava with an essential production of 39 metric tons. Cassava produces more carbohydrates per hectare than any other staple food and can be harvested as needed.

Cassava production is much more than cereal production in Nigeria. Therefore, cassava should be diverted to the production of rabbits as a direct supplement as against the use of cereals. This is what the study is aimed at. Cassava presently is used for so many confectionaries for human consumption (Lukefarn and Ruiz-Feria, 2007). The left over should be shifted for the feeding of rabbits at commercial level.

Statement of the Problem

Protein is one of the classes of food needed by rabbits for growth and development. Despite its importance, there are chains of problems associated with its supply because it is not readily available. One of the major problems is the difficulty in acquisition of sustainable supply of the feed supplement, unavailability of fast growing rabbit breeds, unavailable capital, nonchalant attitude of members of society towards rabbit meat, non-availability of our local breeds etc. the questions are; is there any other feed supplement that can replace growers mash? Can cassava products be used as feed supplement for rabbit production? When these questions are addressed individually or collectively the expected higher level of rabbit production shall be achieved and this most proteineous meat made available at affordable price shall make meat scarcity a thing of the past.

Objectives of the study

The main objective of this study is to investigate cassava products as supplement for improving rabbit production. Specifically, the study sought to:

i) Determine the growth of rabbit using their usual feed of roughages cum concentrate of poultry feed.
ii) Determine the growth of rabbits using cassava products such as main supplement to roughages.

Hypothesis

There is no significant difference in the growth of rabbits fed with usual roughages and growth of rabbits fed with unusual concentrate of cassava products supplement.

Materials and Methods

The study was carried out in the University of Uyo, Akwa Ibom State. Sixteen weaned rabbits of male and female formed the population for the research. Six (6) males and ten (10) females mixed and shared into two hutches (rabbit house) with eight wearers in each hutch. Two (2) large compartments of hutches were acquired, poultry feed was provided for rabbits in hutch "A" tapioca, and cassava flour for those in hutch "B". Roughages such as centrosema pusecenus, apsillia Africana and quaranoditpernata were also added to each of the concentrate. Water was also provided ad-libitum.

Procedures

1. Hutches made of iron plate with appropriate floor were prepare and placed under cool pen to protect them from extreme weather, and predators. The hutches were comfortable for easy access to the rabbits, easy cleaning, feeding and for easy drop of urine and faeces. Feeders and drinkers were also provided in the hutches. The duration of the research was 12 weeks.
2. The rabbits were weighted before they were being put in their individual hutches. The total weight of all the rabbits in the two hutches were known and recorded when individual weights were added together.
3. All the rabbits were allowed to readjust to the environment at least the first day before data were taken affecting each group.
4. The rabbits were all weighed at one (1) week after the outset of the research, which will be done continuously till the end of the experiment which is three months (12 weeks).
5. The feed that has influence on weight gain positively and by how much when compare with the control was determined at the end of the experiment.
   Data collected was subjected to statistical analysis using the independent t-test analytical method as the researcher compared the performance of rabbits in hutch "B" with rabbits in hutch "A" that served as a control as stated below.

$$t = \frac{x - y}{\sqrt{\frac{SD_1^2}{n_1} + \frac{SD_2^2}{n_2}}}$$

x = means score of group A

y = means score of group B

SD_1 = standard deviation of score in group A

SD_2 = standard deviation of score in group B

Cassava: Rabbit feed – preparation of tapioca/ coarse ground feed (flour)

Method of preparation

1. Obtain some quantity of cassava tubers
2. Peel the tuber

3. Wash the peel tubers
4. Use a slicer or kitchen knife and slice them into tiny flakes/chips
5. Parboil the sliced tubers
6. Dry them under the sun or an oven
7. Keep the dried slices under sanity condition while you give it to rabbit in a pelleted form.

Preparation of cassava: coarse ground feed- flour

The cassava tubers are prepared as stated above, but the tubers are ground to be very coarse with large particles than the poultry form.

Observation

Feeding resumed gradually by all rabbits with increase in feed intake. Both groups of rabbits at their own rate continued to eat with corresponding weight gain. Both groups of feed had some roughages of same species incorporated as components of the feed. All rabbits were weighed in the evening, a week after the outset of the experiment. It must be noted that the first day of feeding was not recorded because it was a day left for their readjustment. Measurement of feed started on the second day of feeding.

Table 1: Quantity of feed fed and consumed by two groups of rabbit (experimental and control groups).

	Group A on normal concentrate of poultry feed and usual forages		Group B on cassava concentrate and the usual common forages.	
Week	**Feed consumed in gram**	**Average feed consumed in gram**	**Feed consumed in gram**	**Average feed consumed in gram**
1.	960	120	805	100.65
2.	1040	130.25	1020	127.5
3.	1160	146	1104	138.0
4.	1240	155	1192	149
5.	1480	185	1320	165
6.	1520	190	1376	185.0
7.	1640	205	1540	192.5
8.	1760	220	1620	202.5
9.	2000	250	1850	231.25

10.	2280	285.0	2100	262
11.	2480	310	2380	297.5
12.	2760	345	2520	315

Table 1 above shows the average feed fed to rabbits in grams using two types of feed, the usual concentrate of poultry growers mash and common roughages of *centrosema pubescen, mucuna, stylosantes, pureria* and *quaranodit pernata* for the group A rabbits, while group B rabbits were on cassava concentrate supplement and the above mentioned roughages.

Table 2: Average weight of rabbits in grams/week for experimental and control groups

Week	Group A: (8 rabbits), concentrate of poultry growers mash and roughages	Group B: (8 rabbits), concentrate of cassava products and roughages
1.	25.5	24.0
2.	40.2	38.5
3.	55.0	53.1
4.	70.4	68.8
5.	87.5	86.0
6.	103.4	100.1
7.	122	119.0
8.	141	127.0
9.	159	154
10.	177	173
11.	199	187
12.	227	217
	1986.8	**1,261.59**

Table 2 above shows weight gain per week for 12 weeks with an average weight of over 1kg and approaching the 2kg.

Table 3: Comparing the effect of components of two groups of feed on rabbits' growth, using correlation coefficient statistic

	GPA		GPB		
WK	**X**	**X^2**	**Y**	**Y^2**	**XY**
1.	25.5	650.25	24.0	576	612
2.	40.2	1616.4	38.5	1,482.25	1,547.7
3.	55.0	3025	53.1	2,819.61	2,920.5
4.	70.4	4956.16	68.8	4,733.44	4,843.5
5.	87.5	7,656.25	88.0	7225.0	7,437.5

6.	103.4	10,691.56	100.1	10,020.01	10,310.3
7.	122.0	14,884.0	119.0	14,161.0	14,518.0
8.	141.0	19881.0	127.0	16,129.0	17,907.0
9.	159.0	25,281.0	154.0	23,716.0	24,486.0
10.	177.0	31,329.0	163.0	26,569.0	28,851.0
11.	199.0	39,601.0	187.0	34,969.0	37,213.0
12.	227	51,529.0	217.0	47,089.0	49,229.0
	$\sum X$=1986.8	**$\sum X^2$=209,645.2**	**$\sum Y$=1261.6**	**$\sum Y^2$=179489.3**	**$\sum XY$=171,024.86**

Hypothesis 1:

There is no significant difference on the growth of two rabbits, one on usual poultry growers mash/roughages and one on unusual cassava products/roughages.

Table 4: The performance of two groups of rabbits, one on usual poultry feed (growers mash) and the other group on unusual cassava products and roughages.

Variables (x)	N	X	SD	t-cal	t-tab (crit)
Rabbits on poultry feed/forages	8	248.4	161.88		
				4.98	2.1448
Rabbits on cassava products/forages	8	157.7	149.79		

Table 4 above shows the performance of both types of feeds on the growth of rabbits. The t-cal is 4.98 as opposed to t-tab of 2.14 at 14df on .05 level of significance. Therefore, the hypothesis that says there is no significant difference on the growth of rabbits fed with cassava products and roughages is rejected, and the alternative upheld. The reason was obvious seeing the use of

cassava supplement in place of poultry growers mash could still comfortably promote rabbit production.

Discussion

Rabbit is a simple or mono-gastric stomach animal. Udom-Ekwa (2011) observed that rabbits on roughages alone started to die from the third (3^{rd}) week of experiment and by the fourth (4^{th}) week all rabbits that was fed with roughages died. This was a proof that rabbits could not depend on roughages alone, such as cassava leaves that are injurious (Eggum, 1970), hence, the need for concentrate supplement from cereals and grains, and concentrate produced from cassava tubers. The index of feed efficiency is seen in the growth rate (Jackson et al, 2006). According to Kukefahr (2004) both sets of rabbits had feed combination of both forages and concentrates that proved to give adequate performance in terms of growth rate for meat production when fed the right components of feed. Adewusi and Bradburg (1993) observed that cassava leaves contain good nutrient such as mineral, vitamin B1, B2, C and Carotene but contains Cyanogenic glucose six times higher than the content in root (tubers). This means the tubers are very good source of feed in agreement with this study.

The rabbits used in the experiment were healthy, with good vigour and alertness. The traits for the selection of rabbits was based on feed efficiency and growth rate. (Lukefahr and Ruiz-Feria, 2002). This was seen in the two sets of rabbits. There is need for alternative sources of feed, such as cassava products for the rabbit production. The use of common grains/cereals, in feeding livestock including rabbits has put much pressure on human's feed intake Agboola (1979). Therefore, this research is to find alternative ways of feeding rabbits. This is why this research focused on the place of cassava as alternative supplement of raising rabbits than the usual poultry feed supplement. The use of cassava for various confectionaries for human's consumption has been so highlighted, even by the current Federal Ministry of Agriculture. It could be used as fufu, cassava chips, French fries, tapioca, it is made into flour e.g. cassavita for baking of bread and cakes and other forms of delicacies (Lukegahr, 2004). To the human, cassava has become a staple food especially in developing countries like Nigeria, feeding over 500 million people (FAO, 2011). The abundance of these products from cassava and leftovers from human could be diverted to the feeding of rabbits in Sub-Saharan Africa as a good source of carbohydrate. This agree with the finding of this research that cassava products could be of great use for the feeding of rabbits.

Conclusion

It can be concluded from this study that cassava product with common roughages could be used as unusual main feed supplement for the improvement of rabbit production in Nigeria. For effective utilization of this product, it may be necessary to develop processing methods to reduce or completely eliminate aunty nutrition factors that are present in them.

Recommendations

- Most of the cassava products in the South-South Nigeria should be harnessed and turned to feeding of rabbits for large scale production.
- Provisions should be made by government and other stakeholders in the agricultural sector to grant rabbit farmers access to credit through micro and macro finance from

formal and informal sources. This will encourage farmers in embarking on large scale production, purchasing concentrates feeds which will in turns have appositive effect on the quality of rabbit that will be sold either for consumption or breeding purpose.

- More researches should be carried out on the use of other crops as alternative supplements to poultry feed supplement.

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