Research Paper Veterinary

Cost Effectiveness of Feeding 48 Hours Fermented Taro Cocoyam Meal (Colocasia esculenta var esculenta) to Growing Japanese Quails (Coturnix coturnix japonica)

* Abang, F.B ** Ayuk A.A *** Okon, B. I

* Department of Animal Production, College of Animal Science University of Agriculture Makurdi-Makurdi.

, * Department of Animal Science, Faculty of Agriculture, Forestry and wildlife Res. Mgt, University of Calabar-Calabar

ABSTRACT

This study investigated the cost effectiveness of replacement of maize with 48 hours fermented taro cocoyam meal in the diets of growing Japanese quails over a period of four weeks (28 days). Three hundred and seventy five unsexed Japanese quails of about 2 weeks old of uniform weights were randomly allotted to five dietary treatments (i-v) of seventy five quail each. Each treatment was replicated thrice with twenty five quails per replicate .In each of the five diets,48hrs fermented taro cocoyam meal was used to replace maize at 0%, 25%, 50%, 75% and 100% for treatment I, II.III, iv and v respectively. Feed cost reduced with increased supplementation of cocoyam. Average cost of feed intake per quail was significantly (P<0.05) lowest in treatment v. The cost per gram gain reduced across the treatments. More savings accrued at 100% inclusion levels with highest profit and return to Naira invested .The results indicated improved cost efficiency as levels of fermented cocoyam increased in the diet.

Keywords : Japanese quails, Fermented cocoyam, Maize, Cost effectiveness

Introduction

Least cost consideration and availability are two important drivers of recent feed research efforts. Feed cost makes up between 65 to 75% of the production cost in a poultry enterprise (Ikani, e t, al, 2008). maize plays an important role as a major source of energy in poultry diets (Udebibe and Asoluka, 2008). The demand for maize by man, animal and industry outstrips its supply thereby contributing to the increased cost of poultry feeds. To make production economically efficient, the feed cost has to be lowered (Ikani e t, al, 2008). Given the attendant high cost of conventional energy sources for poultry rations, exploitation of cheap and readily available energy sources as alternative becomes necessary (Agbede, et al, 2002).

Cocoyam has high potential as a replacement for maize as it is cheaper, less-competitive and readily available in the tropics (Abdulrashid,et al.,2007).A lot of researchers have used cocoyam as an alternative energy source to maize in feeding livestock and accrued more savings (Okon, et al,2008; Agwunobi, et al., 2002 and Abdulrashid, et al., 2007). As much as 50% dietary taro cocoyam (boiled/sundried) has replaced all the maize in the diets for broilers (Abdulrashid, et, al., 2007), weaners pigs and rabbits (Agwunobi, et, al., 2002; 2000) as well as growing Japanese quails (Okon, et al., 2007). Only limited research has been conducted using fermented taro cocoyam meal. However, the presence of oxalate, tannins, saponins, phytates and acridity factors could limit its use as feed ingredient (Cooke, et al., 1982; Okon, et al., 2007) .The effect of these anti-nutrient could be reduced by processing (Abeke. et al., 2008)

This study therefore, investigated the cost effectiveness of feeding 45 hrs fermented taro cocoyam meal in growing \Japanese quails.

Material and methods

The study was carried out at Cross River University Technology Calabar.

Three hundred and seventy five unsexed Japanese quails of about the same weight were randomly selected at the expiration of one week acclimatization. The experimental birds were randomly assigned to one of five dietary treatments comprising of seventy five (75) quails per treatment. Each treatment was replicated thrice with 25 quails per replicate. The birds were managed intensively in cages of three tiers. The cages were made up of wood and wire mesh to allow adequate ventilation. Adequate feed, water and space was provided, good sanitary measures were observed. The treatments were administered for a period of four weeks (28days) by which time the quails were 6 weeks of age (42 days).

The composition of diet is presented in Table 1. Cost of quails, feed, medication, transportation, repairs and other expenses incurred during the 4 weeks of research were recorded. Revenue generated from sales of quails and manure were also recorded. Total cost of feed, average cost of feed consumed per quail per week, cost of feed per gram weight gain, feed cost savings per gram meat (Table 2)and return to Naira invested were calculated(Table 3).

The randomized complete block design was used. Data collected were subject to analysis of variance and the least significant difference method was used to separate mean that differed significantly (steel and Torries, 1980).

Results and Discussion

The economic analyses of 45 hours fermented taro cocoyam diets fed to quails are presented in Table 2 and 3. The cost of feed was highest with the feed containing only maize(0% Cocoyam)and least with feed containing only cocoyam (100% cocoyam). It was observed that, feed cost decreases with increased level of supplementation with fermented taro cocoyam in quail's diet. This agrees with the findings of Agwunobi, et al. (2002) and Okon, et, al (2008) who asserted

that, cost of production reduced with increasing levels of cocoyam in pigs' and quails diets respectively.

The mean cost of feed intake per quail per week was significantly lowest (P<0.05) with quails fed 100% cocoyam. Whereas others had similar values. This result was different with the report of Okon, et al (2005) who observed significantly (P<0.05) low differences in cost of feed consumed across treatments using un-peeled boiled taro cocoyam. It could be due to the fact that, in this experiment, metabolisable energy (ME/kcal) was lower and so, more feed was consumed resulting in increased cost. The processing methods could have also accounted for the increased feed intake. unlike the report of Okon, et, al. (2007) who observed decreased feed intake with increased supplementation across treatments probably because of the processing method (cocoyam was not peeled before boiling). Acridity factors are found in the peels of cocoyam which causes irritation and burning of throat (Sakai, 1979). This would have been responsible for the depressive feed intake in their study.

Feed cost per gram weight gained was also reduced as levels of fermented taro cocoyam in the diets increased leading to cost saving per gram of meat. Similar reports have also been reported using cassava meal diets for Japanese quails (Edache, et al.2002) and boiled sundried taro cocoyam for quails (Okon et al., 2008) and fermented sweet orange fruit peel meals for pullets (Oyewole et al 2012.) as replacement for maize.

The result equally recorded highest profit with increase in supplementation. The return to Naira Invested (RNI) for quails fed only fermented cocoyam was highest and least of all those fed with 0% cocoyam (control diet). The results of the RNI was higher than those of Okon et al (2008),probably because of the increase in body weight across the treatments.Okon, et al (2007) observed depressive feed intake and weight gain beyond 50% inclusion levels of boiled taro cocoyam in diets.

TABLE: 2 Economic Analysis of 48 -Hours Fermented Taro Cocoyam Diets Fed to Growing Japanese quails.
Inclusion Levels

Parameters	0%	25%	50%	75%	100%
Cost of feed ₦/kg	89.57	85.76	81.93	78.10	73.92
Ave. Cost of feed	7.73	7.68	7.67	7.60	7.21
Consumed/quail (g)					
Cost of feed/g weight gained (₦/g)	27.77	25.73	20.48	17.96	15.52
Feed cost savings/g meat (₦		2.04	7.29	9.8.1	12.25

Table 3: Return to Naira invested per growing Quail Inclusion Levels

Parameter	0%	25%	50%	75%	100%
Cost of unsexed quails (3weeks)	30.00	30.00	30.00	30.00	30.00
Cost of feed/g/ quail consumed (3.6weeks)	30.91	30.72	30.68	30.40	28.84
Cost of transportation/ bird	20.00	20.00	20.00	20.00	20.00
Cost of medication / bird	4.23	4.23	4.23	4.23	4.23
Miscellaneous	2.50	2.50	2.50	2.50	2.50
Total cost	87.64	87.45	87.41	87.13	85.57
Revenue sales/ quail	150.00	150.00	150.00	150.00	150.00
Sales/manure/ quail	3.47	3.47	3.47	3.47	3.47
Total Revenue	153.47	153.47	153.47	153.47	153.47
Profit (TR-TC)	65.83	66.02	66.29	66.57	6 8.13
R.N.I (Profit/ Total cost)	0.75	0.75	0.76	0.76	0.80

Conclusion

The result of this study showed that feed cost reduced with inclusion of 45 hours fermented taro cocoyam in quails' diets and that, the processing methods could boost the RNI in poultry enterprise.

REFERENCES

Abdulrashid, M., Agwunobi, L. N., Jokthan, G. E. and Abdul, S. B. (2007). | Carcass quality characteristics of broiler finisher fed taro (Colocasia esculenta) cocoyam meal. In Proceeding of the 32nd Annual Conference of Nigerian Society of Animal Production (NSAP) Calabar. March 2007, 457 – 460. | | | Abeke, F. O., Ogundupe, S. O., Sel Coni, A. A., Adeyinkar, L. A., Abubaka, B. Y., Oni, O. O. & Nwagu, B. I. (2008). Response by laying hens to dietary levels of treated sheep manure (HSM). Tropical Journal of Animal Science (2):111–116. | | Agbede, S. O., Ajake, K. & Aletor, V. A. (2002). Inflence of roxazyme G. supplementation on the utilization of sorghum dust based diets for broilers chicks. Proceedings of the 27th Annual Conference of Nigeria Society of Animal Production (NSAP). Akure, March 2002, 105 – 108. | | Agwunobi, L. N., Agwukan, P. O., Caro, O. O. & Isika, M. A. (2002). | Studies on the use of Colocasia esculenta (taro cocoyam) in the diets of weaned pigs. Tropical Animal Health and Production. 34(3):243 – 247. | | Agwunobi, L. N., Okafor, E. P. and Ohazuruice, N. (2002). Tannia cocoyam tuber meal (Xantosoma sagittifolium) as a replacement for maize grain in the diets of rabbits. Global Journal of Pure and Applied Science. 6:419 – 423. | | Akpodiete, O. J., Erurbetine, D. E., and Gagiyovwe, E. E. (2006). Effect of enzyme supplementation on palm kernel cake based diets on broilers chicken performance. Nigerian Poulrty Science Journal. 43:39 – 46. | | Cooke, R. D., Richard, J. O. & Dela Cruz, E. M. (1982). The changes in cyanide content of cassava tissues during plant development. Journal of Food Science and Food Agriculture. 33:269 – 275. | | Edache, J. A., Musa, U., Karin, P. O., Esilonu, J. O., Yisa Okpala, E. J. & Zwandor, N. J. (2007). The value of cassava meal diets for growing Japanese quails (Corturnix coturnix japonica). Nigerian Journal of Animal Production. 34(1):79 – 82. | | Ikani, E. I., Oyibo, S. W. & Aduku, A. O. (2008). Utilization of sesame meal as protein source in broiler diets. Nigerian Journal of Animal Production. 35(1):18 – 28. | | Okon, B. L., Ayuk, A. A. & Obi, M. B. (2008). Cost effectiveness of feeding boiled sun-dried taro cocoyam diets to growing Japanese quails (Corturnix coturnix japonica). Proceedings of the 33rd Annual Conference of the Nigerian Society of Animal Production (NSAP). Ogun, 2008, pp. 422 – 424. | | Okon, B. I., Obi, M. B., Ayuk, A. A. (2007). Performance of quails (Corturnix coturnix japonica) fed graded levels of boiled sun-dried taro cocoyam (Colocasia esculenta) as a replacement of maize. Medwell Online Agricultural Journal. 2(6):654 – 657. | Oyewole,B.O,Olure-mi,O.L.A,Aribido,S.O. and Ayoade,J.A.(2012):Comparati chemical composition of 24-hours fermented sweet orange fruit (citrus sinensis) peel meal and maize effect on performance response of starting pullet chicks. | Nigerian Journal of Animal Production.39(2):57-65 | Steel, R. G. D. & Torrie, J. H. (1980). Principles of procedures of statistics – a biometric approach (2nd edition). New York: McGraw Hill Book Company Incorporated. | | Udedibe, A. B. I. & Asolika, O. C. (2008). Effect of 5 hours wetting of sun- dried cassava tuber meal on the HCN content and dietary value of the meal for young broiler chicks. Nigerian Journal of Animal Production 35 (1):25 – 31. |