

## **Adoption of Organic Poultry and Rabbit Production for Improvement of Quality of Life in Nigeria: A Review**

**Adeniji, C. A.**

**Department of Agriculture, School of Agriculture, Lagos State University, Epe Campus, Lagos**

### **ABSTRACT**

Organic livestock production promotes the use of biodegradable inputs from the ecosystem in terms of animal nutrition, health, housing and breeding. However, it avoids the use of synthetic chemical from outside the ecosystem. Consequently, this paper considers the potentials of organic poultry and rabbit farming in Nigeria. Factors of production available for the take-off and sustenance of organic poultry and rabbits were considered, particularly among the small-scale rural farmers in Nigeria. The paper places emphasis on available production resources within the reach of the farmer. It also highlights measures that will aid adoption of organic poultry and rabbit production in Nigeria.

**Keywords:** Organic poultry, organic rabbit, available resources, quality of life, Nigeria

## INTRODUCTION

The increase industrialization, inappropriate use of unconventional materials in agricultural production and economic recession has opened the ecosystem to a lot of pollution which is gradually eroding the beauty and safety of its inhabitants. Diseases, such as cancer, diabetes and other nutritional and environmentally induced ill health, not known in decades past are now forces to be contended with, yet the economy of the developing countries have continued to decline. Consequently, there is need to employ a multi-dimensional approach that will improve the economy and quality of life of the people. Presently, most developing nations of the world are yet to give attention to the quality and safety of food they consumed; particularly animal and its products. Yet, resources abound for increase production of healthy and safe livestock through the adoption of organic production system. Organic livestock production is a production system that deliberately avoids the use of synthetic and genetically engineered breeding inputs, but promotes the use of organic and biodegradable inputs from the ecosystem in terms of animal nutrition, health, housing and breeding. This system results in the production of safe and good quality animal and its products.

FAO (2007) reported that organic agriculture has many benefits for developing countries in particular. This statement perhaps is premised on the fact that a large proportion of work force in most developing countries is engaged in agriculture. Traditionally, livestock production in Nigeria uses few external inputs; practicing mostly semi intensive production system; a system that is largely organic by default. It is believed that with appropriate agro-ecological knowledge the livestock farmers in the country can harness the benefits of organic livestock farming. Therefore, a positive change in animal production systems will enhance protein security, health and economic status of the people. Consequently, the adoption of organic poultry and rabbit production is being proposed in the realization of these goals. This paper therefore aims at providing information on the potentials of adoption of organic livestock production system for the Nigerian indigenous poultry and rabbits, especially as it relates to available breeds, health management, housing, and feeding in line with organic principles. It also highlights measures that will make adoption of organic poultry and rabbit production a reality in Nigeria.

### Major Indigenous Poultry

Poultry is one of the most popular sources of animal protein in Nigeria; which comes from the exotic and the indigenous birds. In 2011 FAOSTAT reported poultry population of 172 million, with indigenous poultry (Egena *et al.*, 2014, Sola-Ojo *et al.*, 2016) accounting for about 70%. The domestic chicken remains the most cherished and the largest source of poultry meat and egg in the country. It is reported to be a store house of unique genes that could be used in other parts of the world for improving other breeds. Generally, they are grouped on the basis of body size and body weight as heavy (0.90-2.50kg) or light (0.68-1.50kg) ecotype. They could also be grouped on basis of their feathers: normal feather, frizzle-feather and naked neck (Nosike and Nwakpu, 2017).

Another indigenous poultry; turkey is grouped on the basis of their feather colour: white, black and lavender or spotted. The black phenotypic class of turkey is adjudged to possess egg and reproduction qualities which could be useful in the design of long-term genetic improvement programmes of turkey production in the country (Nosike *et al.*, 2017a). Inclusion of the three phenotypic classes has been recommended for long-term genetic improvement programmes in their breeding and production (Nosike *et al.*, 2017b) of the local turkey.

Next to turkey, is the indigenous Guinea fowl. This specie possesses high potential for organic production. There are two main types of guinea fowl species in Nigeria: the crested and helmeted guinea fowl. They are reared throughout the country; abundant in the rain forest zones and derived savannah. They are common in the rural areas, reared together with other domestic fowls. In addition to the aforementioned is the indigenous duck whose production has been neglected in recent time. Muscovy breed is the most prevalent duck in the country accounting for over 80% of the population of duck raised (Duru *et al.*, 2006, Udedibie and Ogbonna, 2006, Oguntunji and Ayorinde, 2015), though they are kept in small flock size. Muscovy has a potential for mean live weight of 2.73 and 1.52kg dressed weight, under scavenging backyard condition they can lay 60-80 eggs and 100-120eggs per year under improve management (Yakubu, 2013).

Finally, there are two other poultry species: Pigeon and Japanese quail. Pigeon has been consumed by rural population of the world since time immemorial. Their feathers are a source of income to local breeders. They are very easy to raise, hardy and less prone to common poultry diseases (Apata *et al.*, 2015). Quail is about the smallest poultry specie, weighing about 180g at maturity. They are prolific and hardy birds with rapid growth rate, mature early, which result into lower cost of production compared with other poultry species (Oyelami and Abu, 2016).

### **Potentials of the Indigenous Poultry for Organic Production**

Indigenous poultry are raised in the rural and urban areas alongside other farm activities to provide significant amount of animal protein and ready source of income, especially during adverse conditions (Ige, 2014 and Odubote, 2015). The efficiency and the advantage of this production system rest on the utilization of family hands as labour, excess farm and domestic wastes for feeding. The indigenous poultry are tripled purpose; they hatch and raise their chicks, produce meat and lay eggs (Odubote, 2015). The hen matures early, fertile and show good fertility and hatchability. They also have small body size and grow slowly which is an added advantage when one considers the low nutrients available to them as against their exotic counterparts. The birds are hardy and are resistant to prevalent local disease organisms and parasites (Ibe, 1990, Nosike and Nwakpu, 2017); thus requiring little or no veterinary care. These are potentials that can be exploited when they are raised under organic system of production, especially when they are produced with little financial input on small scale.

### **Feeding and Meat Quality**

Feeds and feeding are the major determinants of production cost, acceptability and availability of poultry products to the populace. Raising birds under organic system reduces feeding cost and also improves meat quality; birds are opportune to choose what they like in addition to what is provided. Meat produced in this way is more acceptable to most Nigerians as against the meat quality of birds reared intensively which are considered as “too soft”. Feeding of indigenous poultry is largely limited to what they can scavenge from their environment such as weeds, seeds, vegetables, insects, worms among others. Excess and or reject food crops like crushed or whole maize, sorghum and guinea corn, crop residues like cassava peelings, corn bran or chaff among others, as well as household refuse, kitchen wastes and dumps are also eaten.

Indigenous birds can be reared solely or combined. For example, rearing ducks alongside domestic chicken does not affect their production adversely (Ferdus, 1999) due to their different scavenging venues. The helmeted guinea fowl is omnivorous, consuming a wide range of plant and animal materials (even toads), switching their preferences to whatever appears to be available per time. But they focus on insects, arthropods during breeding season (Odukwe *et al.*, 2017a). Odukwe *et al.*, (2017b) opined the ability of helmeted guinea fowl in producing more efficient meat when compared to the domestic chicken.

Pigeons feed on a wide range of food items; grains, slugs, earthworms and insects Adang, (1999). Generally, birds raised in this way have lower fat, tougher and are adjudged healthier (Adesope and Nodu, 2002 and Agwunobi and Ina-Ibor, 2007) and more acceptable to Nigerians.

### **Potentials of Organic Rabbit Production**

Rabbits have small body size, short generation interval with a relatively short gestation period of 30-31 days on the average (Mailafia *et al.*, 2010). Different breeds of rabbits which are adapted to the tropical environment are raised in the country. These include New Zealand white, Californian, Chinchilla, Giant Flemish, Dutch, Angora, Palomino brown, Rex and Havana Black. (Aduku and Olukosi, 1990; Fadare, 2015). Consequently, obtaining any breed of interest is relatively easy. Rabbits have high growth rate and feed efficiency. They are small non-ruminant herbivores with enlarged hindgut, large caecum which supports a population of microorganisms that use nutrients not digested in small intestine. These anatomical features allow them to effectively feed more on plant materials than other non-ruminants (Lukefahr, 2008; Olajide *et al.*, 2016) and makes their feeding very economical.

Rabbit provide an excellent source of protein and may play significant role in solving the need of protein shortage in Nigeria. Rabbit meat is characterized with high protein, low fat and cholesterol (that range between 45 and 85 mg/100g) content when compared with other livestock (Polak *et al.*, 2006 and Nistor *et al.*, 2013); thus a health animal product.

Rabbits can be kept on free range where they make houses for themselves in holes. Also, when reared semi intensively their houses can be constructed from locally available materials such as old packaging cases, intermeshed branches of bamboo strips, local hardwood or bamboo-like materials. Their houses are normally designed to allow for adequate ventilation and quietness. These traits could be of advantage even in urban areas where limited land area is available.

### **Housing**

Housing provision for organic production system is for protection against inclement weather and the night. Organic materials are preferred in the construction of houses of organic poultry houses. The management system is mostly semi intensive; allowing for free movement of the animals. The land requirement for organic poultry production is within the reach of most Nigerians; especially those living in the rural areas who are the major contributors to livestock production. Keeping animal in cage is prohibited under organic animal housing scheme.

### **Organic Animal Health Management Principles and Practices**

The health consequences of organic livestock are based on the principles that an animal that is allowed to exhibit natural behaviour, not subjected to stress and fed optimal organic feed, will have a higher ability to cope with infection than animals reared in a conventional way. Thus, fewer medical treatments through organic means would be required. However, when the need arises alternative treatments instead of conventional drugs are preferred. Although, it has been reported that exposing livestock to outdoor may predispose the animals to viral, bacterial and parasitic infection which may affect the animals and their consumers such as Avian influenza (Kijlstra and Eijck, 2005). Consequently, the use of homeopathy and phytotherapy (non-chemical approach) as immunity booster and treatment of diseases are adopted.

Traditionally in Nigeria, existing indigenous technical knowledge inherited from past generations has sustained the local production system before the advent of exotic commercial stocks. Many plant products have been reported to be in use in many parts of Nigeria for the treatment of poultry diseases which may also be useful in treatment of rabbit and other livestock. Hence, the adoption of ethno veterinary medicine will go a long way in solving the problems of disease infestation in organic poultry and rabbit production in the country.

Coccidiosis, the major health challenge of poultry and rabbit can be reduced with proper pasture management, rotational and ethno-veterinary care; using herbs and spices. Inclusion of phyto-additives like essential oils, spices, medicinal plants, herbs, vegetables and fruits (Benguesmia *et al.*, 2011; Anoh *et al.*, 2017) routinely or periodically in poultry feed have been found useful in boosting their immunity and enhancing productivity (Buba *et al.*, 2016; Akinola and Egwuanumku, 2017; Sobayo *et al.*, 2017).

### **Adoption of Organic Poultry and Rabbit Production**

All stakeholders in agriculture in the country should be willing to be part of the programmes that will lead to the actualization of organic livestock production among farmers and consumers. They should create awareness among the citizenry, train for prospective livestock producers and extension workers. Since the Nigerian livestock industry is dominated by small scale holders, the government should provide and encourage all that is needed for effective take up of backyard poultry and rabbit production. There should be cooperation between organic crop producers and livestock producers to provide needed raw materials.

Ethno-botanical survey should be done urgently and periodically among different ethnic groups to document indigenous medicinal herbs and plants traditionally used for livestock health management. These can be incorporated into animal science and veterinary medicine curricular in our institution of higher learning (Adedeji *et al.*, (2013), while scientists should also conduct research to validate these claims. Hopefully, this may generate substantial revenue to the country, due to reduction in importation of synthetic drugs into the country.

### **REFERENCES**

- Adang, K. L. (1999). Some Aspects of the Biology of Four Columbi Species in Zaira, Nigeria. Ahmadu Bello University, Zaria, Nigeria. M.Sc. Thesis
- Adedeji, O.S., Ogunsina, T.K., Akinwunmi, A.O., Ameen, S.A., Ojebiyi, O.O. and Akinlade, J.A. (2013). Ethnoveterinary medicine in African organic poultry production. *International Food Research Journal*.20 (2):527-532.
- Adesope, O.M. and Nodu, M.B. (2002). A note on acceptance of duck as table-bird met among inhabitants of selected communities in Niger Delta zone, Nigeria. *Livestock Research for Rural Development* 14: [http://www.lrrd.org/lrrd146. htm](http://www.lrrd.org/lrrd146.htm). Accessed September 9, 2012.
- Aduku, O.A and Olukosi, J.O. (1990). *Rabbit management in the tropics: Production, Processing, Utilization, Marketing, Economics, Practical training, Research and future Prospects*. Living Book Services, G.U. Publications, Abuja, Nigeria.
- Agwunobi, L.N and Ina- Ibor, O.B. (2007). Processed rubber seed meal in the diets of growing Japanese quails (*Coturnixcornix japonica*). *Proceedings of the 32<sup>nd</sup> Annual Conference of the Nigerian Society for Animal Production*. 18<sup>th</sup>-21<sup>st</sup> March. Calabar, Cross River State, Nigeria.380-282.
- Akinola, I.O.F and Egwuanumku, J.O. (2017). Heamatology and serum biochemistry of laying hens fed red pepper (*Capsicum annum.*) *Nigerian Journal of Animal Science* 19:(1)127-134.
- Anoh, K. U., Barje, P.P., Iyeghe-Erakpotobor G.T and Akpa, G.N. (2017). Growth performance of heat stressed rabbits fed diets supplement with synthetic and organic antioxidants.. *Proceedings of 42<sup>nd</sup> Annual Conference of Nigerian Society for Animal Production*. 478-481.

- Apata, E. S., Koleose, I.M., Tijani, L.A and Obi, O.O. (2015). Effect of sex on meat quality attributes of pigeon birds (*Columbia Livia*) in Abeokuta metropolis. *International Journal of Agricultural Sciences and Natural Resources*.2 (2): 19-23.
- Benguesmia, M., Niepceron, A., Boucher S, Cortet J Chaumeil T and Cabaret J (2011). Assessing the use of cider vinegar on parasitism and biological growth in organic farming rabbits. *Actes des 14èmes Journées de la RechercheCunicole*, 22-23 November 2011, Le Mans, France, 9-12pp.
- Buba, W., Duru, S., Matemilola, J., Uchendu, C. and Iyi-Olatunji, A. O. (2016).Effect of inclusion of scent leaf (*Ocimum gratissimum*) in the diet on growth and haematology of growing rabbits. *Nigerian Journal of Animal Production*. 43 (2): 324-331.
- Duru, S., Akpa, G.N., Saidu, L., Olugbemi, T.S. and Jonathan, G.E. (2006).A preliminary study on duck management systems under peri-urban system. *Livestock Research for Rural Development*. 18 (3) <http://www.Irrd.org/Irrd183/duru1803b:htm> retrieved 7<sup>th</sup> April 2014.
- Egena, S.S.A., Ijaiya, A. T., Ogah, D.M. and Aya, V.E. (2014).Principal component analysis of body measurements in a population of indigenous chickens raised under extensive management system. *Slovak Journal of Animal Science* 47 (2):77-82.
- Fadare, A.O. (2015). Carcass traits of New Zealand White, Californian, Palomino Brown and Havana Black rabbit in the humid tropics. *Journal of Agriculture and Veterinary Science*. 8 (3): 19-23.
- Food and Agriculture Organization of the United Nations (FAO) (2007)-Proceedings International Conference on Organic Agriculture and Food Security, 3-5 May, Rome. FAO, Rome, 142pp
- FAOSTAT. (20011). Food and Agricultural Organization of the United Nation. <http://faostat.fao.org/default.asp&>. Accessed August 20. 2017
- Ferdus, A.J.M. (1999). *Reproduction, Growth and Meat Yield Performance of Different Genotypes of ducks*. Department of Poultry Science, Bang Agricultural University, M.Sc. Thesis.
- Ibe, S. N (1990). Increasing rural poultry production by increasing the genetic endowment of rural poultry. In Sonaiya E. B. (ed.) *Rural poultry in Africa. Proceedings of an International Workshop*, Obafemi Awolowo University, Ile- Ife, Nigeria.13-16 November, 1989, Thelia Publishers, Nigeria 78-81p.
- Ige, A.O. (2014). Quantitative differentiation of two populations of indigenous chickens in a derived Savannah zone of Nigeria using morphometric traits. *Intertional Journal of Research Studies in Biosciencs (IJRSB)* Vol. 2: 1-16.
- Kijlstra, A and Eijick I.A.J.M (2005). Animal health in organic livestock production systems: A review. *WageningenJournal of Life Sciences* 54 (1): 77-94.
- Lukefahr, S. (2008).Role of organic rabbit farming for poverty alleviation.*Roceedings MEKARN Rabbit Conference: Organic rabbit production from forage*. Cantho University, Vietnam. November 25-27.
- Mailafia, S., Onakpa, M.M. and Owoleke, O.E. (2010). Problems and prospects of rabbit production in Nigeria- A review. *Bayero Journal of Pure and Applied Sciences*. 3(2): 20-25.
- Nistor, E., Bampidis, V. A., Păcalăl, N., Pentea, M., Tozer, J.and Prundeanu, H. (2013).Nutrient content of rabbit as compared to chicken, beef and pork meat.*Journal of animal production advances*. 3(4): 172-176.
- Nosike, R.J. and Nwakpu, O.F. (2017).Effect of genotype on laying performance of local chicken in the humid tropical environment. *Proceedings of the 42<sup>nd</sup> Annual Conference of Nigerian Society for Animal Production*.26-30<sup>th</sup> March, 2017, Landmark University, Omu- Aran, Kwara, Nigeria.101-104p.

- Nosike, R.J., Ebuzor, C. A., Onunkwo, D. N., Obasi, E. N., Ezea, J. Nwakpu, O.F., Obike, O.M., Ibe, S.N. and Oke, U.K. (2017a). Effect of phenotype on egg quality characteristics of F<sub>1</sub> locally-adapted turkey of Nigeria. *Nigerian Journal of Animal Production*. 44 (1); 48-60
- Nosike, R.J., Obike, O.M., Ezea, J., Obasi, E. N., Ebuzor, C. A., Onunkwo, D. N., Nwakpu, O.F., Ibe, S.N. and Oke, U.K. (2017b). Discrimination of the Nigerian local turkey into breeds using linear body measurements. *Nigerian Journal of Animal Production* 44 (1): 54-60.
- Odubote, I. K. (2015). The local chicken of Nigeria- A review. Doi: 10.13140/Rg.2.1.2193.5520 2015-05-10 T15:33:44 UTC.
- Odukwe, C.N., Ukachukwu, S.N., Onunkwo, D.N and Oke, U.K. (2017a) Effect of dietary energy and protein on performance of guinea fowl reared in the humid tropics of Nigeria. *Nigerian Journal of Animal Production* 44 (1): 215-221.
- Odukwe, C. N., Ukachukwu, S. N., Onunkwo, D.N and Oke, U.K. (2017b). Effect of varying energy and protein levels on carcass characteristics of helmet Guinea fowl in the tropics. *Nigerian Journal of Animal Production* 44 (1): 222-226.
- Oguntunji, A.O and Ayorinde, K.L. 2015 Duck production in Nigeria: flock characteristics, management and mortality. *ArchivaZootechnica* 18 (1): 27-40
- Oyelami, B. A. and Abu, O.A. (2016). Growth blood indices and carcass characteristics of Japanese quail (*Coturnixcoturnix japonica*) fed cassava grits as replacement for maize with or without  $\beta$ -glucanase. *Nigeria Journal of Animal Production*. 43 (2): 284-294.
- Polak, T., Gasperlin, L., Rajar, A and Zender, B. (2006). Influence of genotype lines, age at slaughter and sexes on the composition of rabbit meat. *Food technology and biotechnology*. 44 (1): 65-73.
- Sobayo, R. A., Okonkwo, I.J., Sanwo, K. A., Oso, O.A., Eruvbetine, D., Oguntona, E. B., and Muhammed, S. B. (2017). Effect of dietary supplementation of guinea hen weed (*Petiveriaalliacea*) leaf and root meals on nutrient utilization and intestinal morphology of finishing broiler chicken. *Nigeria Journal of Animal Science*. 19 (1): 144-165.
- Sola-Ojo, F.E., Ayorinde, K.L., Fayeye, T.R., Ahatu, I.A., Obadare, A. R. (2016). Effect of genotype and sex on growth traits, feed utilization and survivability in Nigerian local and Nicholas white exotic turkey. *Nigerian Journal of Animal Production*. 43 (2):37-49.
- Udedibie, A, B.I and Ogbonna, R.C. (2006). On-farm evaluation of growth of Muscovies under free-range and confinement in South-Eastern Nigeria. *Nigeria Journal of Animal Production* 33 (2):268-273.
- Yakubu, A. (2013). Characteristics of the local Muscovy duck in Nigeria and its potentials for egg and meat production. *World Poultry Science Journal*. 69 (4)931-938.