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ASSESSMENT OF PRODUCTION OF UNDERUTILIZED POULTRY SPECIES IN IWO AGRICULTURAL DEVELOPMENT PROGRAMME (ADP) ZONE OF OSUN STATE, NIGERIA

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Abstract

The widening supply-demand gap of poultry products in Nigeria calls for urgent attention toward improving the production and productivity of poultry with a special interest in underutilized poultry species. This study was carried out to examine the level of production of underutilized poultry species and the factors influencing it in the Iwo ADP Zone of Osun State. A multistage sampling procedure was adopted to select 150 poultry farmers for the study. Data were obtained through physical interview of the farmers, then analysed using descriptive statistics and ordinary least square (OLS) regression. Results showed higher percentage of males in poultry production and mean age of the poultry farmers was 49.19±12.40 years with a mean length of experience in poultry keeping of 11.0±7.4 years and mean flock size of 68± 17. It was deduced from the study that majority (77.3%) of the poultry farmers had no or limited access to extension services. As determinants of the rearing of underutilized poultry species in the study area, results of multiple linear regressions showed the coefficients of the age of poultry farmers, and length of poultry farming experience was positive and statistically significant (P< 0.01). Household size was also positive and statistically significant (P< 0.05). Based on the findings, the study, therefore recommends the need for an enlightenment campaign and awareness on the importance of rearing underutilized poultry species and strengthening the livestock extension services for effective and result-oriented service delivery to the poultry farmers.

Key words**:** *poultry, underutilized species, assessment, production, improvement*

INTRODUCTION

Poultry is domesticated avian species that can be raised for eggs, meat, and/or feathers.
The term "poultry" covers a wide range of birds, from indigenous and commercial breeds of chickens to Muscovy ducks, mallard ducks, turkeys, guinea fowls, geese, quails, pigeons, ostriches, and pheasants [16]. Poultry is raised throughout the world, with chickens by far the leading species everywhere [8]. Poultry production can be subdivided into three distinct parts namely, small, medium, and large scale. These are also otherwise known as backyard, semi-commercial, and commercial [20]. The country's standing poultry population is at present 180 million birds, a substantial increase from about 151 million birds, most of which are domiciled in the southern part of the country either in semi-intensive farms or intensive ones [7].
The popularity of poultry in Nigeria is highly significant and this can be as a result of its important role in food security and value chains. [10 and 16] argue that poultry birds are good sources of protein either used as eggs or meat. They further explained that the production of poultry birds is relatively cost-effective, thus, making it possible for low-income farmers to start up the business [10, 16, 17, 18]. More so, the return on poultry investment is relatively high compared to other livestock production and the high level of acceptability of the poultry meat across diverse ethnic backgrounds and religious beliefs broadens the market share and makes the business very viable. In addition to the benefits created by poultry meat, [1] remarked

that poultry eggs are more affordable for low-income earners compared to other sources of protein [1]. This adds to the relative importance of poultry to agriculture.

Extension services have to assure an efficient communication with the farmers regarding the transfer of knowledge and results from the scientific research [4].

The Nigerian poultry sub-sector has great potential for a wide range of reasons. Poultry farming has considerable potential for providing income opportunities, reducing malnutrition, generating employment opportunities, and alleviating poverty, especially for small farmers in Nigeria. Small farmers can start poultry farms at their homestead area at a low cost compared to other livestock farming. In addition, poultry farming also provides opportunities for other industries like feed mills, hatcheries, veterinary drugs, feed ingredients market, and as a market outlet for maize and soybeans farmers [9].

According to the Central Bank of Nigeria [2], the poultry sub-sector is the most commercialized of all Nigeria's agricultural sub-sectors with a current net worth of ₦1.6 trillion. The demand situation is estimated at over 200 million birds, while the demand for eggs and meat is about 790,000MT and 1,500,000MT, leaving a huge demand gap which, unfortunately, is met through smuggling. Thus, there is a need to improve the production and productivity of the poultry sub-sector in Nigeria. As high as the contribution of the poultry sector to the Nigerian economy, Chicken accounted for the majority of the production, followed by turkey production (unpublished source). In 2017, chickens contributed 89 percent of world poultry meat production, followed by turkeys with 5 percent, ducks with 4 percent, and geese and guinea fowl with 2 percent. The rest comes from other poultry species [21]. In recent years, the demand for quail birds and their products in Nigeria is increasing due to their medicinal, nutritional, and economic benefits [14]. According to [22], quail eggs can help to prevent kidney, liver, and gallbladder stones. The nutritional value of quail eggs is much higher than those offered by other eggs as they are rich sources of antioxidants, minerals, and vitamins, and give us a lot of nutrition than other foods [13].

In Nigeria, local ducks are raised on the free range alongside domestic chickens. Though ducks are hardier and more resistant to diseases and environmental hazards, they are fewer than chickens due basically to cultural beliefs which tend to portray ducks as mystique birds. A profitable small backyard poultry project is more feasible with ducks than with chickens because ducks have longer productive (egg-laying) periods. Therefore, the main objective of this study was to assess the level of production of underutilized poultry species (ducks, guinea fowls, turkeys, geese, and quails) in the Iwo zone of the Agricultural Development Programme (ADP), Osun State, Nigeria.

MATERIALS AND METHODS

Study area

The study was carried out in the Agricultural Development Programme (ADP) Iwo zone, Osun State. The zone comprises of seven local government areas namely; Iwo, Irewole, Ejigbo, Ayedire, Ayedaade, Isokan, and Ola-Oluwa.It has an area of 245km^2 and a population of 120,919 [15], and the current population of 5,521,901 composed with the annual population growth rate of 3.3% [3]. The poultry farmers are concentrated in the rural areas of the zone than the other ADPs zone in the state from the available records of the membership register of the Poultry Association of Nigeria (PAN).

Source and type of data

Primary data were used for this study. The Data were obtained through physical interview of the farmers with the aid of a well-structured questionnaire that captured the socioeconomic characteristics of poultry farmers and farm characteristics.

Sampling procedure and data collection

The study was carried out using a multistage sampling procedure to select a representative sample of poultry farmers from the study area. At the first stage, Iwo zone was selected among the three (3) agricultural zones in Osun State, because of the predominance of

underutilized poultry species and the availability of a market for poultry products in the study area. During the second stage, three (3) local governments from the study zone were randomly selected, then, two farming communities were randomly selected from each of the selected local government areas, making a total of 6 communities. Finally, twenty-five (25) poultry farmers were randomly selected from each selected farming community to make a total of one hundred and fifty (150) sampled poultry farmers for the study.

Analytical techniques and models

The data obtained were carefully analyzed using descriptive analysis, and multiple linear regression analysis. The descriptive statistics used were frequency, proportion (percentage), mean, and standard deviation while the inferential statistical tool used was multiple linear regression.

Model specification

In estimating the parameters of socio-economic characteristics, descriptive statistics (percentages, frequency distribution, mean, standard deviation) were used to show the description of the socioeconomic characteristics of the respondents. The multiple linear regression models were specified as follows:

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + U \quad (1)$$

where:

Y = determinants of the rearing of underutilized poultry production

X_1 = Age of respondent (years)

X_2 = Sex of the respondent (1= male, 2= female)

X_3 = Household size (number)

X_4 = Level of formal education

X_5 = Length of poultry-keeping experience (years)

X_6 = Access to extension services (1= yes, 2= No)

X_7 = Hired labour

U = Error term

$b_{0,\ldots\ldots}$ b_7 = coefficients of the independent variables

RESULTS AND DISCUSSIONS

Socioeconomic characteristics of keepers of underutilized Poultry species

Table 1 presents the socioeconomic characteristics of the keepers of underutilized poultry species. The table shows that more than half (59.3%) of underutilized poultry farmers were below the age of 50 years while the mean age was 49.19±12.40 years. The results further showed that the majority (72.0%) of the keepers were male, while a few (28.0%) were females. It was revealed that a few (7.3%) of the keepers are single, a large number (78.8%) are married, 1.3% is divorced, 7.3% are a widower and 5.3% were separated.

Table 1 reveals that more than half (56.7%) of the keepers had a household size of 4-6 persons, having a mean household size of 6±4 persons, which implies a large household size. The results indicate that few (7.3%) of the poultry keepers had no formal education; while 17.3% had primary education, 34.7% had secondary education and 40.7% had their tertiary education which determines their exposure and level of adoption of innovation in the field of poultry production.

The results in Table 1 further indicate that a few (32.7 %) of the respondents had less than 5 years of poultry-keeping experience, while 29.3 % had 6-10 years of poultry-keeping experience. The mean length of poultry-keeping experience was 11.0±7.4 years. It was also gathered that the majority (77.3%) of the farmers did not have access to extension services. A larger percentage of those that have access to the extension service (78.0%) had a low connection and (15.3%) had a high connection while (6.7%) had a very high connection.

This study revealed that the majority of our correspondence had little or no access to advisory services (through extension services) or consultancy to aid adequate information on poultry production and disease management; as access to extension services positively influence the management of poultry farms and encourage the farmers to adopt improved farming methods [6]. The keepers depend on long experience in the place of extension

services. This long poultry-keeping experience will affect their production practices positively with their reasonable knowledge of poultry production and its problems such that they handle poultry production problems perfectly on their farms just as reported by [19] who observed that years of poultry-keeping positively influence poultry management.

Table 1. Distribution of Socioeconomic Characteristics of Keepers of underutilized Poultry Species

Characteristic	Frequency	Proportion (%)
Age (years)		
≤ 29	14	9.3
30-39	32	21.3
40-49	43	28.7
≥ 50	61	40.7
Mean = 49.19	S.D = 12.40	
Sex		
Male	108	72
Female	42	28
Marital Status		
Single	11	7.3
Married	118	78.8
Divorced	2	1.3
Widow/ Widower	11	7.3
Separated	8	5.3
Household Size		
≤ 3	32	31.3
4 – 6	85	56.7
≥ 7	33	22.0
Mean = 6.0	S.D = 4.0	
Level of Education		
No formal education	11	7.3
Primary	26	17.3
Secondary	52	34.7
Tertiary	61	40.7
Poultry Keeping Experience (years)		
≤ 5	49	32.7
6 - 10	44	29.3
11 – 15	22	14.7
≥ 16	35	23.3
Mean = 11.0	S.D = 7.4	
Access to extension services		
Yes	34	22.7
No	116	77.3

Source: Field Survey Data, 2021.

The literacy levels of the keepers also helped in the absence of extension and consultancy services. The implication of this is that the costs of obtaining new technical and related information for the farmers will be reduced substantially when they can read and understand published materials and simplified farm journals, which are increasingly becoming the modern vehicle for disseminating information through various online media.

Factors affecting the rearing of underutilized Poultry in the study area

Table 2 presents the coefficients of multiple linear regressions for the determinants of the rearing of underutilized poultry species in the study area.

The coefficient of multiple determination (R^2) shows that 70.4 % of the variation in the rearing of underutilized poultry was determined by the included independent variables in the model. The coefficient of R^2 and F statistics which were significant at $p < 0.001$ showed that the exponential model was well-fitted.

The results presented in Table 2 revealed that the rearing of underutilized poultry in the study area was significantly influenced by age, household size, and years of poultry-keeping experience. All these variables had a positive relationship with the underutilized poultry production, except age which had a negative coefficient. The coefficient of age size was 8.62 ($P<0.01$), implying that a year increase in the age of poultry farmers would increase the rearing of underutilized poultry by 8.6 units. This result confirms that the youthful age of the producer helped to combine more inputs effectively leading to higher levels of gross revenues.

The household size had a positive coefficient of 3.62 ($P<0.05$), implying that a unit increase in the household size would increase the production of poultry farmers in underutilized poultry by 3.6 units.

The coefficient of years of poultry farming experience was 8.64 ($P<0.01$), implying that a year increase in the year of poultry keeping would increase the production of underutilized poultry by 8.6 units.

It is believed that longer experience in poultry keeping should translate to better management practices and skills in the exploration of other poultry ventures such as embarking on underutilized poultry production.

This finding on length of experience confirms [5], indicating that the more years they put in the production process the more experienced they become and the more they would

increase their flock size, depending on the prevailing circumstances.

Table 2. Multiple Regression Analysis showing determinants of underutilized poultry rearing in the Iwo ADP zone of Osun State

Variable	Coefficient
(Constant)	1.099***
Age	-8.618***
Sex	8.961
Household size	3.620**
Level of Formal Education	1.553
Years of Poultry Keeping Experience	8.638***
Access to Extension	-1.059
Hired Labour	0.821
F Statistics = 2.113 R^2 = 0.7042 Adj R-squared = 0.6894	

Source: Field Survey Data, 2021.
*** Significant at 1%, ** Significant at 5%, * Significant at 10%

Constraints to Poultry production in the study area

The constraints affecting the underutilized poultry production in the study area, is presented on Table 3. Seven major problems were identified (with their respective weight mean score), these are unavailability of the market for stock ready for sale (2.41), inadequate access to extension services (2.05), high rate of mortality (1.97), high cost of feeds (1.94), lack of access to credit facilities (1.85), high cost of medication (1.84), and high incidence of poultry diseases (1.79).

Of these constraints, the unavailability of a ready market was one of the major constraints with 1st rank suffered by the poultry farmers in the area. With pronounced poverty both in the urban and the rural areas [12], demand for these birds became low despite the shift in consumption patterns from the other sources of livestock proteins to poultry products and fish due to changing tastes, costs, and income [11]. Inadequate access to extension services was ranked second. Further investigation revealed that farmers depended on information from fellow poultry farmers and the few that can read got such information from books and related publications. The high rate of mortality ranked third among the problems experienced by the farmers in the study area. High incidence of poultry diseases, lack of access to credit facilities, high cost of medication, and high cost of feeds ranked fourth, fifth, sixth, and seventh, respectively.

Table 3. Distribution of constraints affecting the production of underutilized poultry species in the Iwo ADP zone of Osun State

Factor	Not constraint	Minor constraint	Major constraint	WMS	Rank
Unavailability of a ready market	13 (8.7)	62 (41.3)	75 (50.0)	2.41	1st
Inadequate access to extension services	50 (33.7)	42 (28.0)	58 (38.7)	2.05	2nd
High rate of mortality	34 (22.7)	86 (57.3)	30 (20.0)	1.97	3rd
High incidence of poultry diseases	41 (27.3)	70 (50.7)	33 (22.0)	1.94	4th
Lack of access to credit facilities	50 (33.3)	72 (48.0)	28 (18.7)	1.85	5th
High cost of medication	52 (34.7)	70 (46.7)	28 (18.7)	1.84	6th
High cost of feed	61 (40.7)	59 39.3	30 (20.0)	1.79	7th

Source: Field survey Data, 2021.
*Parentheses are in percentage.

CONCLUSIONS

The factors that were discovered to have a positive effect and significant influence on the rearing of underutilized poultry in the study area included the age of the poultry farmers, household size, and years of poultry-keeping experience.

Based on the findings of the study, the authors, therefore, recommend the following:
-Enlightenment and awareness campaign on the importance of rearing underutilized poultry birds to increase the level of poultry production in the study area.
-The stakeholders in the poultry industry should assist poultry farmers in training on modern practices in the rearing of underutilized poultry birds.
-Government should revitalize the livestock extension services delivery to poultry farmers.

REFERENCES

[1]Aboki, E. A., Jongur, A. U., Onu, J. I., 2013, Productivity and Technical Efficiency of Family Poultry Production in Kurmi local Government Area of Taraba State. Nigeria. Journal of Agriculture and Sustainability, 2013, 4 (1):52-66.
[2]Central Bank of Nigeria, (CBN), 2021, Annual report and statement of account Nigeria. Released on 29th of July, 2021.
[3]City Population, 2020, Osun State, Nigeria – Population Statistics, Charts, Map and Location. https://www.citypopulation.de, Accessed on March 20, 2023.
[4]Chukwudum, E.G., 2019, Effectiveness of agricultural development programme communication methods on broiler production technology adoption among farmers in Anambra State, Nigeria, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol.19(4), 53-58. https://managementjournal.usamv.ro/pdf/vol.19_4/volume_19_4_2019.pdf, Accessed on May 22, 2023.
[5]Emaikwu, K. K., Chikwendu, D.O., Sani, A.S., 2011, Determinants of flock size in broiler production in Kaduna State of Nigeria. Journal of Agricultural Extension and Rural Development, 2011, 3 (11):202-211.
[6]Evans, M. M., Samuel, N. N., Samuel, C. M., 2021, Production of indigenous poultry among smallholder farmers in Tigania West Meru County, Kenya. African Journal of Agricultural Research, 17 (5):705-713.
[7]FAO, 2018, Food and Agriculture Organization of the United Nations. Africa Sustainable Livestock 2050: Livestock and Livelihoods Spotlight. Nigeria. Cattle and Poultry Sectors.
[8]FAO, 2020, Food and Agriculture Organization of the United Nations. Gateway to Poultry Production and Products: Products and Processing. Retrieved March 3, 2020 from http://www.fao.org/poultry-production-products/products-processing/en/. Accessed on ????
[9]Hassan, A. A., Ahmadu, H. J., Oseni, Y., Dawang, N. C., Rahman, S. A., AbdulSalam, Z., 2016, Economic Analysis of Poultry Egg Enterprise in Kaduna State, Nigerian J. Anim. Prod. Res., 2016, 28 (1):196-204.
[10]Heise, H., Crisan, A., Theuvsen, L., 2015, The Poultry Market in Nigeria: Market Structures and Potential for Investment in the Market. PhD Student, Post Doc& Professor, Georg August University of Goettingen, Department of Agricultural Economics and Rural Development Chair - Management of Agribusiness, Platz der Goettinger Sieben 5, D-37073 Göttingen, Germany. International Food and Agribusiness Management Review Vol. 18, Special Issue A, 2015.
[11]Ja'afar-Furo, M. R., Balla M. R., Yakubu, B., 2007, Avian influenza (Bird flu) outbreak news scare and its economic implications on poultry enterprises in Adamawa State, Nigeria. Global J. Agric. Sci., 6:61-68.
[12]Kwaghe, P. V., Amaza, P. S., Ja'afar-Furo, M. R., 2009, The relationship between social factors and the poverty experienced by farming households in Bornu State, Nigeria. Global J. Agric. Sci., 8: 119-126.
[13]Lawani, P., 2011, Quail Egg Nutrition. http://www.buzzle.com/articles/quail-egg-nutrition.html. Accessed on 15th April 2012.
[14]Muhammad, L. A., Amolegbe, K. B., Abdulsalam, O. A., 2017, Economics of Quail Production in Ilorin, Kwara State. Department of Agricultural Economics and Farm Management University of Ilorin, Ilorin, Nigeria. Journal of Agricultural Extension, 21 (2).
[15]National Population Commission (NPC), 2006, Analysis of Nigerian 2006 census
[16]Oduntan, O., 2019, Technical effciency of smallholder poultry farmers in Akure South Local Government area, Ondo State, Nigeria, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol.19(1), 313-319, http://managementjournal.usamv.ro/pdf/vol.19_1/Art43.pdf, Accessed on May 22, 2023.
[7]Ogbona, S.I., Emerole, C.O., 2018, Analysis of production and profitability of chicken egg farms in Abia State, Nigeria, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol.18(3), 275-280, https://managementjournal.usamv.ro/pdf/vol.18_3/volume_18_3_2018.pdf, Accessed on May 22, 2023.
[18]Ogbona, S.I., Emerole, C.O., 2018, Analysis of income and profitability of chicken egg marketing business in Abia State, Nigeria, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol.18(3), 281-286, https://managementjournal.usamv.ro/pdf/vol.18_3/volume_18_3_2018.pdf, Accessed on May 22, 2023.
[19]Olorunwa, O. J., 2018, Economic analysis of broiler production in Lagos State poultry estate, Nigeria. Journal of Investment and Management, 7 (1):35-44.
[20]Rimi, N. A., Sultana, R., Muhsina, M., Uddin, B., Haider, N., Nahar, N., Zeidner, N., Sturm-Ramirez, K., Luby, S. P., 2017, Biosecurity Conditions in Small Commercial Chicken Farms, Bangladesh 2011-2012. EcoHealth, 14 (2):244–258.

https://doi.org/10.1007/s10393-017-1224-2. Accessed on the 15th of March 2020.
[21]Sineque, A. R., Macuamule, C. L., Dos Anjos, F. R., 2017, Aflatoxin B1 contamination in chicken livers and gizzards from industrial and small abattoirs, measured by ELISA technique in Maputo, Mozambique. International Journal of Environmental Research and Public Health,14 (9): 951.
[22]Umera, A. E., Ejezie, F.E., Ibegbu, M.D., Ikekpeazu, J.E., Onyekwelu, K.C., Ejezie, C.S., 2018, Effects of quail (*Coturnix japonica*) egg diet on both the blood sugar and the lipid profile of alloxan induced diabetic albino rats. Biomedical Research 29 (9): 3599-3604