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Adoption of Poultry Farming Technologies for Increased Poultry Production in Yenagoa Local Government Area, Bayelsa state

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Abstract

The study examined poultry farming technologies for increased poultry production in Yenagoa Local Government Area of Bayelsa State. Multi-stage sampling procedure was employed to select 150 respondents. Data were obtained through the use of structured questionnaire and analyzed using frequency, percentage and mean. From the result, more than half (54.7%) of the respondents were female, the average age and monthly income of the respondents were 37 years and N34,000 respectively. The respondents were aware of some poultry farming technologies such as automated feeding system (84.0%), health monitoring (50.7%) among others. Watering system (78.7%), precision nutrition (50.7%), lighting control (48.7%), biosecurity (48.3%) were available poultry farming technologies. Enhanced efficiency (x=3.19), animal welfare (x=3.10), enhanced biosecurity (x=3.07) among others, are the perceived benefits of using poultry farming technologies. Factors militating against the use of poultry farming technologies were lack of technical expertise (x=3.49), limited access to finance (x=3.45), erratic power supply (x=3.38) among others. The respondents' awareness of poultry farming technologies did not significantly influence the use. It was recommended that more awareness of poultry farming technologies should be created and increased through advocacy and public enlightenment campaigns by poultry farmers' group and other stakeholders.

Keywords: *Poultry Farming Technologies, Increased, Poultry Production, Yenagoa LGA*

Introduction

Poultry is viewed as one of the cheapest source of animal protein and the easiest avenue through which this animal protein can be increased, and ensure protein availability in human diet which serves as primary source of amino acid for body building, provide vitamins and minerals which indirectly supplement deficiency of protein in human system (Bello,2022). Poultry production in Nigeria is one of the choice areas of livestock production due to their high feed conversion ratio. They have the potential to convert kitchen waste to protein and increased body weight more than any farm animal. Again poultry production can take place on areas of land that discourages crop production. This means that poultry can act as a favourable and useful enterprise on non-arable

land Poultry production in Nigeria for the past centuries have being through traditional ways. This method is characterized by decentralized and and small scale production (Walker and Hudson, 2014).

Rural communities and households in Nigeria engage in raising ducks, chickens, guinea fowls and other species of poultry using age old methods. The practice often involves free range systems where the birds are allowed to forage for food, roam freely while benefiting from natural surroundings. This method does not allow improvement in productivity as it is faced with numerous challenges such as disease outbreak, theft, being predated upon, etc. Traditional poultry breeds often have lower egg-laying capabilities and growth rate compared to improved species. This decrease poultry yield and household income. In addition, poor feeding practices and inadequate nutrition also lead to low output. This is because the birds depend only on chicken waste and the little amount of feed ingredients they are able to pick through scavenging and other non-conventional technique. Interestingly, through invention various improved technologies for poultry production have been developed to enhance productivity and reduce losses. Improved poultry management practices such as diseases control, feeding and better housing promises increased yield. Also, adoption of disease-resistant and high yielding breeding yet preserving traditional ones because of culture could increase productivity. Hansen (2014) noted that the products of technology and development remains important factor in global development transformation of the economy in general and agricultural particular. This means that the use of technologies in productive engagements such as poultry production will enable farmers explore greater opportunities and overcomes challenges in the agricultural subsector. It is on the basis of the fore going that the study seeks to examine poultry farming technologies among poultry farmers for increased poultry production in Yenagoa LGA, Bayelsa.

Objective of the Study

The specific objectives were to:

i. describe the socio-economic characteristics of poultry farmers in the study area;
ii. identify the various types of poultry farming technologies available;
iii. ascertain the awareness and sources of information on poultry farming technologies for increased production;
iv. ascertain perceived benefits of using poultry farming technologies for increased poultry production; and
v. identify factors militating against the use of poultry farming technologies by poultry farmers for increased production in the study area.

Materials and Methods

The area of the study was Yenegoa Local Government Area (LGA). Yenagoa is one of the LGAs and capital city of Bayelsa State, Nigeria. It is located at the southern part of the country in the Niger Delta area with a robust agro ecological environment, situated between latitude 4050'N and 5005'N and longitude 6010'E and 6040'E (Uzobo, Ogbanga & Jack, 2014) as shown in the map in fig 3.1. The LGA has an area of 706 km² and a population of 352,285 at the 2006 census. Oborie, Udom and Nwankwoala (2014) further explain that the Ijaws form the majority of the state. English is the official language, but Epie-Atissa language

is one of the local languages, spoken in Yenagoa, others such as Ekpetiama, Gbarian, Buseni and Zaramaare Ijaw dialect inYenagoa LGA (Oborie, Udom & Nwankwoala, 2014). The area is basically rural to sub urban, covering a number of communities within Yenagoa Local Government Area of Bayelsa state, Nigeria. Yenagoa is located within the transition zone of the Coastal sedimentary low land hydrogeological province in Southern Nigeria. The swamps are vegetated tidal flats formed by reticulate pattern of inter connected meandering creeks and tributaries of the River Niger. The area is underlain by thick succession of sedimentary rocks. The main occupation of the people is farming. Due to its ecological features which favour food production, residents of the area are heavily engaged in agriculture. The major agricultural activities carried out in the area include fishing, production of cassava, maize, okra, yam, fluted pumpkin, sheep, goat, etc. However, non-farm activities such as trading, canoe making etc. also thrive very well.

Multi-stage sampling procedure was employed. The first stage was a purposive sampling of poultry farmers with a minimum number of 50 birds among the 348 registered poultry farmers in the study area, which brought the population to 302. Secondly, simple random sampling procedure was used to select 50% of the population bringing the selected poultry farmers to 150. A total of 150 poultry farmers having a minimum of 50 birds were surveyed. Primary data was basically used for the study. The instrument used for data collection was the interview schedule. The data collected was presented using descriptive statistics such as frequency count, percentage and mean and inferential statistics such as simple regression at 0.05 significant level. The linear regression model is defined by

$Y = (X1, X2, X3, X4... \ldots\ldots\ldots\ldots\ldots..,e$ (1)

Where:

Y = increased poultry production,

X_1 = Sex: Male=1, female=2; X_2 = Age (years); X_3 = Marital status: single =1, married =2, separated =3, Divorced =4 Widow/Widower =5; X_4 = Household Size 1-2 =1, 3-5 =2, 6-8 =3; X_5 = Educational Level: No formal education =1, primary =2, Secondary =3, Tertiary Education =4; X_6 = Occupation: farming =1, trading =2, civil service =3, Skilled works=4; X_7 = Net monthly income: (₦); X_8 = Years of Experience: (years); X_9 = Sources of Fund: Contribution among members =1, NGO =2, Donor Agencies =3 Government – Federal, State or Local =4; e = error term

Results And Discussion

Socio-Economic Characteristics of the Respondents

Table 1 shows that majority (51.4%) were married; this indicated that the poultry farmers in the study area were involved in family life and as such were saddled with family responsibility and support (Albert et al 2014), had secondary education (39.3%) which is goo because according to Elenwa et al (2019); and Elenwa et al (2022), education aids in adoption of new innovations and technologies, 4.7% of the respondents were female while 45.3% are male. This indicated that female constituted more of poultry farmers in the study area. This is because women plays significant role in agriculture which cannot be over emphasized. This result corroborate with the position of Tijani (2022) that women in Africa are the primary and major producers of poultry and other farm animals raised for food and other industrial products. The average age of the

respondents was 37 years; this indicated that the respondents are young and active. They were in their productive age that could enhance productivity in the poultry enterprise. This is because researches has shown that young farmers are more open to embrace technological advancement, have better access to technologies and information due to knowledge of digital tools and outline resources, exhibits more risk-taking behavior and enhance technological knowledge transfer, among others (Chiekezie et al, 2022). Mean household size of 5 persons; this indicate that the farmers on the average had 3 dependents who eat together from the same pot and sleep under the same roof. It further shows that other than the farmer, other members of the family could serve as source of labour in the use of poultry technologies (Elenwa et al, 2021). Mean poultry experience of 7 years which indicated that the farmers were experienced in the poultry farming operation. This may have led to accumulated knowledge and understanding of the local environment and they may possess insight around the climate variations, the challenges and prevalent disease affecting poultry in their region and a mean income of ₦34,000.

Table 1: Distribution of respondents according to their socio-economic characteristics

Variables	Category	Frequency(n=150)	Percentage(%)	Mean (X)
Sex	Male	68	45.3	
	Female	82	54.7	
Age(Years)	20-30	18	12.0	
	31-40	44	29.3	
	41-50	64	42.7	37years
	Above50	24	16.0	
Marital Status	Single	26	17.3	
	Married	77	51.4	
	Separated	18	12.0	
	Divorced	24	16.0	
	Widow/Widower	5	3.3	
Household size	1-3	26	17.3	
(persons)	4-6	82	54.7	5 persons
	Above6	42	28.0	
Educational Level	Non-formal	14	9.3	
	Primary	24	16	
	Secondary	60	40	
	Tertiary	52	34.7	
Main Occupation	Farming	45	30.0	
	Trading	29	19.3	
	Civil Service	48	32.0	
	Skilled works	28	18.7	
Monthly Income (N)	Less than 30,000	24	16.0	
	18,000-27,900	19	12.7	N34,000
	28,000.00-37,900	28	18.6	
	38,000.00-48,000	60	40.0	
	More than 48,000	19	12.7	
Experience (Yrs)	1-4	22	14.7	
	5-8	46	30.7	
	9-12	45	30.0	7years
	13-16	36	24.0	
	Above16	1	0.7	

Types of Poultry Farming Technologies Available in the study area

Entries from the result shows that majority (78.7%) of the respondents indicated that watering system is ranked 1st, followed by precision nutrition (50.7%), lighting control system, biosecurity, manure management, health monitoring system, automated feeding system, smart farming app, climate control mechanism, cage-free and free range system, genetics and breeding system and block chain and traceability mechanism that ranked 2nd, 3rd, 4th, 5th, 6th, 7th, 9th and 10th respectively, are available poultry farming technologies in the study area.. This result confirmed

the report of Olaniyi, Adesiyan and Ayoade (2017) that poultry production technologies are available for utilization among poultry farmers in Oyo State, Nigeria.

Table 2: Distribution according to type of available poultry farming technologies

S/N	Types	Frequency (n=150)	Percentage (%)	Ranking
	Automated Feeding System	58	38.7	6th
	Watering System	118	78.7	1st
	Climate Control	47	31.3	8th
	Lightning Control	73	48.7	3rd
	Genetics and Breeding	45	30.0	9th
	Health monitoring	64	42.7	5th
	Bio-Security	71	47.3	4th
	Manure Management	67	44.7	5th
	Smart Farming App	49	32.7	7th
	Precision Nutrition	76	50.7	2rd
	Block Chain and Traceability	34	22.7	10th
	Cage Free and Free range system	47	31.3	8th

Source: Field survey data, 2023 **Multiple response**

Awareness of Poultry Farming Technologies

The respondents awareness of poultry farming technologies is shown in Table 3 According to the result, majority (84%) of the respondents were aware of automated feeding system which ranked first, about half (50.7%) were aware of health monitoring system, 46% each were aware of genetics and breeding and biosecurity, 39.3% were aware of climate control technology, 38.7% were aware of cage free and free range pattern, 36,0% were aware of lighting control technology, 30.7% were aware of block chain and traceability technology, 25.3% were aware of manure management and 21.3% were aware of precision nutrition that ranked from 2nd to 10th respectively. This implies that some of the respondents are aware of some poultry farm technologies, while some are not. This is in agreement with findings of Olurunfemi et al (2021) and Bello et al. (2022) that while farmers in the poultry sector are aware of some poultry technologies, others were not while Albert et al (2015) observed a significant relationship between awareness and adoption of treated mosquito nets and family planning progammes.

Table 3: Respondents distribution according to their awareness of poultry farming technologies

Poultry farming technologies	Frequency(n=150)	percentage (%)	Ranking
Automated Feeding System	126	84.0	1st
Watering System	48	32	7th
Climate Control	59	39.3	4th
Lightning Control	54	36.0	6th
Genetics and Breeding	69	46.0	3rd
Health monitoring	76	50.7	2nd
Bio-Security	69	46.0	3rd
Manure Management	38	25.3	9th
Smart Farming App	32	21.3	10
Precision Nutrition	32	21.3	10th
Block Chain and Traceability	46	30.7	8th
Cage Free and Free range system	58	38.7	5th

Source: Field survey data, 2023. **Multiple responses**

Perceived Benefits of Adoption of Poultry Technologies

From table 4, the respondents perceived that the use of poultry farming technologies enhances efficiency in the farm ($\overline{x} = 3.19$), improves animal or poultry welfare ($\bar{x} = 3.10$), enhances biosecurity ($\bar{x} = 3.07$), improves disease control ($\bar{x}$ 3.06), helps in data-driven decision making ($\bar{x} = 3.03$), enhances optimal nutrition management ($\bar{x} = 3.05$), contribute to increased production and productivity ($\bar{x} = 3.05$) and increased scalability and profitability ($\bar{x} = 3.01$). The grand mean of 3.07 indicated that the respondents benefited from adopting poultry production technologies. This implies that adoption of poultry farming technologies serve crucial purpose in poultry farming in the study area. This result corroborate the report of Ojo, Ogumbiyi and Ojo (2018) that farmers derive several benefits from adopting poultry farming technologies in Oyo State in Nigeria.

Table 4: Distribution according to perceived benefits of using poultry technologies

S/N	Benefits of Using Poultry Farming Technologies	Sum	Mean $\bar{x}$	Remark
1.	It enhanced efficiency	479	3.19	Agreed
2.	Improved disease control	459	3.06	Agreed
3.	Optimal nutrition management	453	3.02	Agreed
4.	Data driven decision making	454	3.03	Agreed
5.	Enhanced bio-security	461	3.07	Agreed
6.	Improves animal welfare	465	3.10	Agreed
7.	Scalability and profitability	451	3.01	Agreed
8.	Contribute to increase production	45	3.05	Agreed
	Grand mean		**3.07**	

Source: Field Survey Data, 2023 Mean score:≥ 2.50 = agreed; < 2.50 = disagree

Factors Militating against the use of Poultry Farming Technologies in the Study Area.
The factors militating against the use of poultry farming technologies by the respondents is shown in table 5 include: lack of technical expertise ($\bar{x} = 3.49$), limited access to finance ($\bar{x} = 3.45$), infrastructural limitation, ($\bar{x} = 3.45$), erratic power supply ($\bar{x} = 3.38$), high investment cost ($\bar{x} = 3.35$), inadequate water supply ($\bar{x} = 3.31$), poor performance of technologies (x=3.21), poor road network (x=3.20), among others. The grand mean of 3.26 confirmed this. Atala and Issa (2022) reported that cause of low technologies adoption included other issues such as poor performance of technologies, inadequate basic infrastructures such as water, electricity, road network, and inadequate technical knowhow among others.

Table 5: Distribution according to factors militating against the use of poultry farming technologies

Militating Factors	**Sum**	Mean ($\overline{x}$)
Lack of awareness and knowledge	472	3.15
High investment cost	502	3.35
Limited access to finance	518	3.45
Lack of technical expertise	523	3.49
Infrastructure limitations	517	3.45
Resistance to change	471	3.14
Maintenance and operational cost	448	2.99
Erratic power supply	507	3.38
Poor road network	480	3.20
Lack of water supply	497	3.31
Inefficient exit service laundry	452	3.01
Poor performance of technologies	481	3.21
Grand mean		**3.26**

Source: Field Survey data, 2023 Mean ≥ 2.5 = Agreed; < 2.50 = Disagree

H_{O1}: There is no significant relationship between the socio-economic characteristics of poultry farmers and adoption of poultry farming technologies for increased poultry production in the Study Area

The result in Table 5 highlights the coefficient of the relationship between the respondents' socio-economic characteristics and adoption of poultry farming technologies for increased poultry production in the study area.

Table 5: Summary of regression analysis on the relationship between the socio-economic characteristic of poultry farmers and adoption of poultry farming technologies

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std.Error	Beta			Lower Bound	Upper Bound
1	(Constant)	2.266	.273		8.315	.000	1.727	2.805
	Sex	.039	.071	.047	.556	.579	-.101	.180
	Age	-.011	.049	-.023	-.218	.828	-.107	.085
	M.status	-.031	.039	-.077	-.783	.435	-.109	.047
	Hhsize	-.112	.055	-.177	-2.048	.042	-.221	-.004
	Edu.quali	.050	.040	.111	1.231	.220	-.030	.130
	Occupation	.077	.032	.200	2.413	.017	.014	.140
	Income	-.050	.031	-.152	-1.631	.105	-.111	.011
	Exp	.046	.038	.112	1.202	.231	-.030	.122
	source.fund	-.036	.032	-.102	-1.131	.260	-.099	.027
	Numberofbirds	.016	.035	.040	.464	.644	-.052	.084

Rsquare(R^2)0.124 F-value.1.972

related to their adoption of poultry farming technologies, whereas sex (0.579), age (0.828), marital status (0.435), educational level (0.220), income (0.105), poultry farming experience (0.231), source of fund (0.260) and number of birds (0.644) are not significantly related.

Conclusion and Recommendations

The technologies available are automated feeding and watering system, climate and lightning control systems, genetics and breeding, health monitoring, bio-Security, manure management, smart farming App, precision nutrition, block chain and traceability and cage free and free range system. However, using these technologies was faced with some militating factors such as lack of awareness and knowledge, high investment cost, among others. Based on the findings, it was recommended: There is need for poultry farming technologies to be made available to farmers by poultry farmers groups and philanthropic individuals for use and onward adoption.

References

Albert, C.O. & Nne-Cosy, J. (2014). Analysis of family planning programmes among rural households in Ogba/Egbema/Ndoni Local Government Area of Rivers State, Nigeria. *Agricultura, Agricultural Practice and Science Journal*, 1-2 (89-90), 158-163.

Albert, C.O, Isife, B.I & Jaja, G.M. (2015). Adoption of insecticide treated nets by rural dwellers in Rivers State, Nigeria. *Journal of Economics and Sustainable Development, 6(16), 8-14*.

Atala, T.K. &Issa, F.O. (2022).Agricultural and Innovation Diffustion and Adoption.In, M.C Madukwe. (Ed).*Agricultural Extension in Nigeria* (3rd Ed.). *Agricultural Extension Society of Nigeria, 26 (2): 36-61*.

Bello, O.G, Abdulraham, O.L, Kayode, A.O, Busari, I.Z &Koloche, I.M. (2022). Awareness of Poultry Farmers on Biosafety practices against infectious disease in Kano State, Nigeria. *Journal of Agricultural Extension, 26 (2): 1:11*

Chiekezie, N.R., Nwankwo, E.C & Ozor, M. U. (2022).Analysis of Small Scale broiler poultry production in South East Nigeria.International *Journal of Animal and Livestock Production Research* 6(1): 1-16

Elenwa, C.O. & Ishikaku, E. A. (2018). Influence of culture on women farmers' participation in agriculture activities in Ahoada East Local Government Area of Rivers State. *International Journal of Horticulture, Agriculture and Food Science (IJHAFS*), 2(3), 88-97.

Elenwa, C. O. & Emodi, A. I. (2019). Soil conservation practices among rural farmers in arable crop production in Omuma Local Government Area of Rivers State, Nigeria. Agro-Science Journal of Tropical Agriculture, Food, Environment and Extension, 18(3), 42-47

Elenwa, C. O. Elenwo, C. E. & Ebin, I (2022). Soil Conservation Practices among Vegetable Farmers in Etche Local Government Area, Rivers State, Nigeria. International Journal of Agriculture and Earth Science (IJAES), 8. (6), 76-87

Hajiyev, R., Salmanova, K., Mammadov, G. & Taghiyev, U. (2022). Application of intensive technologies for improved production processes in poultry farms. *Eastern-European Journal of Enterprise Technologies 4(1 (118)):90-102*.

Tijani, S.A (2022). Women in Agriculture In: Madukweme M.C (Ed). Agricultural Extension in Nigeria.Agricultural Extension Society of Nigeria.102-113.

Ojo, M.A, Ogunbiyi, Y.G & Ojo, A. O (2018).Effects of Adoption of improved technologies on poultry production in Oyo State, Nigeria. *Proceedings of 2nd international conference on Economic Research*, 15-21

Olurunfemi, O.D., Olurunfem, T.O., Oladele, O. I., Malomo, J.O (2021). Knowledge of Extension Agents on Climate Smart Agricultural Initiatives in South West Nigeria.*Journal of Agricultural Extension* 25 (4): 23-21

Olaniyi, O.A, Adesiyan, I.O & Ayoade, R.A (2017) constraints to utilization of poultry production technology among farmers in Oyo State, Nigeria. *Journal of Ecology*, 24 (4): 305,

Walker, E. L. & Hudson M.O (2014) Species of Meat animals; Sheep and goat. In: M. Dikeman, & C.Divine, (Eds). *Encyclopedia of Meat Science* (2nd Edition): Elsevier ltd Academic Press Retrieved Online on 28th April, 2021 .