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Medication Practices Among Free-range Poultry Farmers in Delta State, Nigeria

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ABSTRACT

The study investigated medication practices of free-range poultry farmers in Delta State, Nigeria. A multi stage random sampling procedure was used to select five hundred and twenty-six free-range poultry farmers from the study area. A well-structured and validated questionnaire was used to collect data. The data were analyzed using various descriptive statistics (like frequency counts, means, percentages, standard deviation) and inferential statistics. Although about 99% of the respondents were aware of the practice of medication, only about 13% of them actually practice medication on their flocks. The regression results showed that educational level, farming experience and flock size were positively and statistically significant and the explanatory variables explained about 83% of the total variation in medication practice by the farmers. The t-test results further showed that there were significant differences in income, productivity of bird, mortality and egg production between practitioner of medication and non-practitioner of medication. Marketability of those who practiced medication was also higher. It was recommended among others, that free range poultry farmers should be enlightened on the importance of the use of medication on birds and veterinary services should be brought to the reach of the farmers.

KEYWORDS: Poultry, Free-range, Medication practices, probit regression

INTRODUCTION

There are different estimates of the population of the poultry in Nigeria. For example, one estimate puts the figure at 104.3 million (FLDPCS, 1992), while FAO estimate was roughly 190 million (FAO, 1991). FLDPS/RIM (1991) estimated the total poultry population in Nigeria at between 133 – 165 million. However, it is generally believed that about 90% of the figure derives from the local poultry stock which is in turn composed of chickens (91%), guinea fowl (4%), ducks (3%), turkeys and others (2%). Poultry, which is second only to ruminants as a source of animal protein in Nigeria, accounts for roughly 25% of local meat production (FLDPCS, 1992). According to FAO (1991) and NAERLS Ahmadu Bello University, Zaria (2000) about 85% of this population of poultry is raised in the rural areas under the free-range

system of management, whereby birds are allowed to roam freely with little or practically no care by the farmers. Thus it is crystal clear that local poultry plays a significant role in the Nigerian poultry industry. Practically every household in the rural areas in Nigeria keep on form of poultry bird or the other, making poultry the most common livestock enterprise in Nigeria (Udoh and Etim, 2007; Orajaka, 2005). According to several scholars, free range poultry stock play a crucial role in promoting food security of the poorest households and reducing vulnerability (Dolberg, 2004; Otte, 2006; Ahuja, *et al.*, 2008; Tafida, 2014). Local chickens play key roles in rural communities; local chicken production provides the fast growing human population with high quality protein. Sale of eggs and live birds is a major source of income (Ajala *et al.*, 2007) to rural families. Chickens are also used for traditional rituals, means of knowing the time (cock crowing), used as presents and in forging marriages and friendship, and where food shortages are rare, they are kept to supplement the meals or to dignify a guest (Nwagu, 2002). Local chicken production contributes immensely to food security, poverty reduction and ecologically friendly management of natural resources. Local chicken meat is high in demand because consumers usually prefer its hard meat. There is an increasing demand of local chicken in restaurants because of its size, low price and the palatable nature of the meat compared to exotic breed of poultry (Kperegbeyi, *et al.*, 2009). However, the per caput animal protein consumption in Nigeria, and indeed the African continent of 4.5 grammes (Atsu, 2002), falls short of the FAO requirement of 35 grams per caput per day (FAO, 1999).

Low productivity of the local chicken is one of the reasons responsibly for this ugly situation which is due to avalanche of reasons, of which poor medication and inadequate nutrition are major culprits (Orajaka, 2005). Poor livestock health constitutes one of the major constraints to sustainable livestock production in many developing countries including Nigeria. Veterinary medicine is poised at raising livestock productivity to improve food security, improve human health by preventing zoonotic diseases, improving human well- being and animal health (Adepegba, *et al.*, 2006). One of the effective ways of increasing the productivity of the local poultry is by routine vaccination against diseases like Newcastle and fowl pox, de-worming of birds, observation of good sanitation and administration of drugs against major infectious diseases (NAERLS/ Ahmadu Bello University, Zaria, 2000; Orajaka, 2005). This can only be possible when farmers have access to veterinary services. Veterinary services are services to

improve animal health and are provided by professionals aimed at providing livestock farmers with the following: animal health and disease control, product and market development and animal production and preservation (Gbolagade, *et al.*, 2013). The availability and quality of veterinary services can play a crucial role in boosting the productivity of livestock (Umali, Narrod and Deininger, 1994). It is a well-known fact that local chickens are well-adapted and suffer less from diseases than the more vulnerable exotic breeds. However, disease outbreak in local chicken can has a detrimental effect on a flock of local chicken (NAERLS/ Ahmadu-Bello University, Zaria, 2000). Some of the local diseases and parasites that affect local chickens are according to NAERLS (2000) are: external parasites, internal parasites like roundworms, tapeworms, threadworms, etc., and diseases such as Newcastle disease (the most common disease of local chickens), coccidiosis, fowl pox and fowl cholera; poisoning can also result when birds feed on contaminated feed or forages.

Therefore, for the potentials of local chickens to be realized it is imperative that farmers practice medication apart from providing feed supplement and shelter. However, studies on medication practices by free-range poultry farmers in Delta State, Nigeria are almost non-existent. The need to assess the medication practices of free range poultry farmers thus becomes sine qua non. Following this, the following research questions arise: What are the socio-economic characteristics of the free range poultry farmers in Delta State? What are the major diseases of poultry in the area? What is the level of awareness of farmers of these diseases? Do free range poultry farmers have access to veterinary services? What proportion of the free range farmers practice medication on their birds? What factors are likely to influence farmers' practice of medication on their birds? The broad objective of this study is to critically investigate medication practices of free range poultry farmers in Delta State, while the specific objectives are to determine the number of free-range poultry farmers that practice medication of their birds; determine the level of practice of poultry medication, and to identity the factors influencing the practice of medication by farmers in the study area.

The following null hypotheses were tested in the study:

Ho_1: Some selected variables (gender, age, marital status, level of education, farming experience, farm size and household size) of free range poultry farmers do not have any significant relationship with their medication practices.

Ho_2: there is no significant difference between farmers who practice medication and those who did not practice medication in terms of profit.

METHODOLOGIES

The Study Area

This study was conducted in Delta State, Nigeria. Delta State lies between latitude 5°and 6° 30´ North and longitude 5° and 6° 45' East. The state has an annual rainfall of over 2000mm in the coastal areas and over1500mm in the northern areas. The rainfall is heaviest in the month of July with a brief break in August. The state has an average temperature range of about 39^0C to 44^0C. Its natural vegetation can be demarcated into rainforest, freshwater forest and mangrove swamp forest. This makes Delta state an agriculturally advantaged state. The state has a total population of about 4,098,391 people according to National population census (National Population Commission, 2006). It comprises of twenty-five Local Government Areas demarcated into three agro-ecological zones, namely: Delta North, Delta Central, and Delta South agro-ecological zones. The major occupation of the people is farming. Major crops grown include tree crops like rubber, oil palm; tuber crops such as cassava, yam, cocoyam; cereals such as maize and swamp rice; and assorted vegetables. The livestock commonly reared include sheep, goat, poultry, fish and micro livestock such as snail, rabbit and grass cutter.

Sampling Procedure and Sample Size

The multi-stage random sampling procedure was employed to compose sample for the study. With the multi-stage sampling procedure, a representative unit (the sample) is composed in a stepwise fashion. The process of multi-stage sampling procedure adopted in the study was as follows:

Stage 1: Selection of Local Government Areas

Three local government areas were randomly selected from the list of the local government areas in each of the three agro-ecological zones. Thus, a total of nine local government areas, representing 36% of the twenty- five local government areas in Delta State, were selected.

Stage 2: Selection of Communities:

Three communities were randomly selected from each local government area giving a total of twenty-seven communities that were used for the study.

Stage 3: Selection of Respondents:

Twenty respondents were randomly selected from each of the selected community. Thus a total of five hundred and forty respondents were selected and used for the study. However only 526 questionnaires were used for the study as 14 of the questionnaire were either lost or improperly filled

Method of Data Collection

A well-structured and validated questionnaire was the major instrument used for the collection of data from the respondents. Data collected were on socio-economic characteristics of free-range poultry farmers, level of awareness of veterinary services, actual practice of medication, respondents' perception of the determinants of medication practices. To improve the efficiency and effectiveness of data collection, an interpreter was employed for those who could not speak English in each of the local government area. The data collection process lasted for a period of five months.

Method of Data Analysis

Various descriptive statistics (like frequency counts, percentages, means and standard deviation) and inferential statistics like probit regression analysis and t-test were employed for data analysis. The instrument for data analysis also include the Likert scale with values 1= not serious, 2= not very serious, 3 = undecided, 4 = serious and 5 = very serious which was used to measure the constraints facing farmers.

Test of Hypotheses

Ho_1: Some selected variables of free range poultry farmers do not have any significant effect on their medication practices. The probit model was used to test for this hypothesis.

The probit regression analysis used was implicitly stated as; $Y=f(X_1, X_2, X_3, X_4, X_5, X_6, + X_{7+} e)$

Where

Y = Medication practice; Y = 1if the farmer practice medication; 0 otherwise
X_1 = Gender (years)
X_2 = Age
X_3 = Marital status
X_4 = Level of Education
X_5 = Farming experience
X_6 = Farm size
X_7 = Household size
e = Stochastic error term

The model was specified explicitly as follows:

$$Y = X_j b_i$$

$$Y=b_0+b_1X_1+b_2X_2+b_3X_3+b_4X_4+b_5X_5+b_6X_6+ b_7X_7+e$$

Where:

Y = as defined earlier
X_1, X_2, X_3, X_4, X_5, X_6 and X_7 are as defined earlier.
b_i = parameters, estimated by maximum likelihood

Ho_2: there is no significant difference between farmers who practice medication and those who did not practice medication in terms of profit. T-test of unequal sample size was used to test for this hypothesis.

RESULTS AND DISCUSSION

Socio – Economic Characteristics of Free-range poultry farmers

The socio-economic characteristics included gender, age, marital status, education level, farming experience, farm size and household size. The result in Table 1 showed that almost two-third (65.8%) of the free range poultry farmers were males and about 34.2% were females. The mean age of the farmers was 55.4 years, while majority were over 50 years old. Most of the respondents (63.3%%) were married; only 6.3% had never been married.

The results of educational attainments of the free range poultry farmers showed that 18.6% had no formal education, 24.3% had primary education, more than half (50.6%) of them had secondary education, while only about6.5% had tertiary education. Majority of the respondents are quite experienced in the rearing of free range birds. The result in Table 1 clearly indicated that about 62% of the free range poultry farmers had over 10 years' experience in the business.

Table 1: Socio-economic characteristics of respondents

Variable	Frequency (403)	Percentage (100)
Gender		
Male	346	65.8
Female	180	34.2
Age (years)		
Less than 30	20	3.8
30 – 39	88	16.7
40 – 49	78	14.8
50 -59	156	29.7
60 and Above	184	35.0
Marital Status		
Single	35	6.7
Married	333	63.3
Divorced	63	12.0
Widowed	95	18.1
Educational Level		
No formal	98	18.6
Primary	128	24.3
Secondary	266	50.6
Tertiary	34	6.5
Farming Experience (year)		
5 and below	21	4.0
6 – 10	179	34.0
11 – 15	102	19.4
16 and Above	224	42.6
Farm Size (no. of birds)		
10 and below	112	21.3
11 – 20	75	14.3
21 – 30	215	40.9
31 – 40	97	18.4
More than 40	27	5.1
Household Size (Number)		
5 and below	99	18.8
6 – 10	378	71.9
Above 10	49	9.3

The result in Table 1 further showed that majority of the free range farmers operate on very small sizes of flock; as can be seen from the result presented, only 27 farmers (5.1%) out of the 526 farmers studied had flock size of more than 40 birds. The implication of this finding is that the keeping of free range birds by farmers in Delta State is still at the small-scale level. The household size was average as about 71.9% of the respondents had between 5-10 members in their homes.

Major poultry diseases identified by respondents in the study area

Table 2 shows the major poultry diseases identified by the farmers in the study area. The results in Table 2 indicated that the major avian diseases identified by the free range poultry farmers included external parasites (91.6%), internal parasites (99.2%), and diseases such as Newcastle disease (92.0%), bird's flu (96.6%), gumboro (26.2%), coccidiosis (65.0%), fowl pox (25.3%) and fowl cholera (57.2%); poisoning was also mentioned by 499 (94.9%) respondents. NAERLS of the Ahmadu Bello University, Zaria (2000) and Kperegbeyi et al. (2009) identified external parasites, internal parasites like roundworms, tapeworms, threadworms, and diseases such as Newcastle disease (the most common disease of local chickens), coccidiosis, fowl pox and fowl cholera and poisoning as militating factors against the health of local chickens.

Table 2: Identified major poultry diseases

Poultry disease/ Parasite	Frequency (526)	Percentage (100)
Newcastle	484	92.0
Coccidiosis	342	65.0
Fowl pox	133	25.3
Fowl cholera	301	57.2
Gumboro	138	26.2
Bird flu	508	96.6
Poisoning	499	94.9
Internal parasites	522	99.2
External Parasite	482	91.6

Farmers' awareness of medical packages/services

The results in Table 3 shows that practically almost all the free range poultry farmers (99%) were aware of medical services/packages for their poultry. Only very insignificant proportion of the

farmers (less than 1%) was unaware of medical services. Therefore it could be concluded that the awareness level of medication packages by the farmers was very highly significant ($P<0.001$).

Table 3: Farmers awareness of Medication packages/services

Awareness status	Frequency (526)	Percentage (100)
Aware	521	99.0
Not aware	5	1.0
Total	526	100

3.4 Farmers Access to medical Packages for their birds

The results in Table 4 shows access of farmers to sources of medical services for their poultry. The results in Table 4 showed that most of the free range poultry farmers access medical packages from veterinary officers who are certified to provide veterinary services.

Table 4: Farmers access to medical packages

Source of medication	Frequency (68)	Percentage (100)
Certified veterinary officer	57	83.8
From drug shops	8	11.8
Other sources	3	4.4

Level of Medication Practice by Farmers

Table 5 shows the level of medication practice by free-range poultry farmers in the study area. The result in Table 5 shows that only 2.5% of the respondents practiced medication of their birds on a routine basis, while about 10.5 % practice it occasionally. It was disappointing that in spite of the importance of medication and high level of awareness of the free range farmers of medical packages/services, about 458 (87%) individuals do not practice medication at all.

Table 5: Level of medication practice

Level of medication	Frequency	Percentage
Frequently	13	2.5
Seldom	55	10.5
Not at all	458	87.1

Source: Survey data, 2015

Constraints militating against the practice of medication

Table 6 showed the various constraints faced by free-range poultry farmers. The result in the Table indicated that cost of medication was the major constraint encountered by the farmers. Gbolagade *et al.* (2013) ranked cost of veterinary services (mean = 2.03) as the foremost constraint facing poultry farmers in Delta State, Nigeria. Access to veterinary services was ranked as the second most serious constraint (mean = 2.03), followed by lack of drugs (mean = 2.03); lack of interest by the respondents was the least constraint faced by the farmers. Gbolagade *et al.* (2013) also identified lack of veterinary services and unavailability of drugs as problems to poultry farmers. Most of the respondents also indicated that they were not interested in the medication of their birds. Lack of awareness was not a constraint (mean = 2.03) as can be seen in Table 6.

Table 6: Constraints militating against practice of medication

Constraint	Mean score	Standard deviation	Rank of mean
Cost of medication	4.79	0.61	1st
Access to veterinary services	4.66	0.49	2nd
No drugs	4.03	0.82	3rd
Lack of interest	3.89	0.57	4th
Lack of awareness	2.01	0.64	5th

Likert Scale: 1 = Not serious, 2 = Not very serious, 3 = Undecided, 4 = Serious, 5 = Very serious

Tests of Hypotheses

i. Ho_1: Some selected variables of free range poultry farmers do not have any significant effect on their medication practices. The probit model was used to test for this hypothesis.

The model was significant as shown by the model's chi square. The R^2 of 83% shows that the explanatory variables account for 83% of the variation of the dependent variable. The result of the probit regression in Table 7 shows that three socio-economic variables, namely, education attainment, farming experience, and flock size of the respondents were significant and positively related to medication practices by the farmers.

Table 7: Probit regression result of socio-economic variables affecting medication practices

	Parameter	Estimate	Std Error	Z	Sig	95% Confidence interval	
						Lower bound	Upper bound
PROBIT	Sex	0.076	0.522	0.187	0.983	.772	.884
	age	0.045	0.064	1.222	0.205	.542	.706
	Marital status	0.062	0.23	0.779	0.626	.801	.999
	Lev. of Edu.	0.66	0.048	3.137	0.020*	.513	.823
	Far. experience	0.49	0.098	2.972	0.041*	.447	.674
	Flock size	0.081	0.671	2.301	0.033*	.788	1.124
	H/hold size	0.72	0.016	0.520	0.562	.234	.436
	Constant	-0.786	1.144	0.653	0.611	-1.441	0.779
	Model X^2	121.011					
	Df	520					
	R^2	.831					

*Significant at P≤ 0.05

The implication of this finding is that farmers with higher levels of educational attainment, longer years of experience in the business and with larger flock sizes are more likely to practice the medication of their birds.

ii. Ho_2: there is no significant difference between farmers who practice medication and those who did not practice medication in terms of profit.

The t-test result on some selected variables is presented in Table 8. The result showed that there were significant differences in all the variables tested. The variables are annual mean values. Income was measured in naira, productivity in average live-weight of bird, mortality in percentage death of birds in a flock; egg production as annual number of eggs laid. Marketability was measured as the ability of the free range farmers' birds to attract customers.

Table 8: T- test result of some variables of practitioners of medication and non- practitioners

Variables	Medication practitioners	Non Medication practitioners	T- value	Remark
Income	42670	20590	2.984	Significant
Productivity	1.53	0.98	2.788	Significant
Mortality	0.25	0.67	2.639	Significant
Egg production	68	39	2.591	Significant
Marketability	High	low	-	Significant

CONCLUSION AND RECOMMENDATIONS

The study successfully examined the medication practices of free range poultry farmers in Delta State. From the findings of the study, it could be concluded that although majority of the respondents were aware of the poultry medication, only very few of them practice medication. Therefore, it was concluded that the practice of avian medication by the free range poultry farmers was very low and discouraging. From the findings of the study, the following recommendations were made:

1. Farmers should be educated on the importance of practicing avian medication of their birds; this could be done through organizing workshops and seminars.
2. Veterinary services should be made available to the farmers not only at all times, but at affordable prices.
3. Farmers should be encouraged to keep larger flocks as keeping larger flocks will justify the cost of medication

If these recommendations are duly implemented, it is hoped that the poultry industry will live up to its expectation- producing enough protein to ameliorate protein-food crisis in the Delta State in particular, and Nigeria at large.

REFERENCES

Adepegba, O.A., Apantaku, S.O. and Oluwalana, E.O.A. (2006). Poultry Farmers Preference and use of Commercial and Self-compounded Feeds in Oyo Area of Oyo State Nigeria. *Agriculture and human values*, 23, 2: 245-246

Ahuja, V., Dhawan, M., Punjabi, M. And Maarse, l. (2008). Poultry Based Livelihoods of Rural Poor: Case of Kuroilev in West Bengal. South Asia Pro-poor Livestock Policy Programme. A Joint Initiative of NDDB and FAO Document 012, P. 12.

Ajala, M. K., Nwagu, B. I., Sekoni, A. A. and. Adesechinwa, A. O. K. 2007. The profitability of Turkey production in Zania, Kaduna State, *Nigeria Journal Information Technology 6* (1): 27-33.

Atsu, D. W. (2002). Contributory Role of Animal Production in National Development. Procceding of 7th Annual Conference of Animal Science Association of Nigeria (ASAN), September 16-19.

Dolberg, F. (2004). Review of household poultry production as a tool in poverty reduction with focus on Bangladesh and India, in Ahuja, V. (Ed) Livestock and Livelihoods: National Dairy Development Board: India and Pro-poor Policy, South Asia. FAO.

Federal Department of Livestock and Pest Control Services (FLDPCS, 1992). Nigerian National Livestock Survey, Abuja, Nigeria.

FDLPCS/RIM (1991). Nigerian National Livestock Survey Report. Federal Department of Livestock and Pest Control Services, Abuja, Nigeria.

Food and Agricultural Organization (FAO) (1999). Statistical Database. www.fao.org. Food and Agricultural Organization of the United Nations, Rome, Italy.

Food and Agricultural Organization (FAO) (1991). Nigeria National Livestock Survey. 1-2.

Gbolagade Benjamin Adesiji, Mukaila Gbenga Olujide, Yemisi Olukemi Adesiji, Oghenevwegba Peter Orogun, and Sola Emmanuel Komolafe (2013). Comparative Analysis of Public and Private Veterinary Services Delivery Among Commercial Poultry Farmers In Delta State, Nigeria. *Journal of Sustainable development in Africa*, 51 (7): 12-27.

Kperegbeyi, J.I., Meye, J.A. and Ogboi, E. (2009). Local chicken production: Strategy of household poultry development in coastal region of Niger Delta, Nigeria. *African Journal of General Agriculture*, 5(1): 17-20

National Agricultural Extension and Research Liaison Services, Ahmadu Bello University, Zaria (2000). Improving the Performance of Local Chickens. Extension Bulletin No. 92. Poultry Series No. 6

NPC (2006). Year Book on Nigeria Population Data. National Population Commission, Nigeria.

Nwagu, B.I. (2002). Production and Management of Indigenous Poultry Species. A Training Manual in National Training Workshop on Poultry Production in Nigerian National Animal Production Research Institute, Shika, Zaria. 10 – 26pp.

Orajaka, L. J. E. (2005). The Role of Local Chickens in Poultry Production in Nigeria. *Nigerian Veterinary Journal*, 26 (2): 68-72.

Otte, J. (2006). The hen which lays the golden eggs. Why backyard poultry are so popular? PPLPI feature, www.fao.org/ag/pplpi.html.

Tafida, A. A., Kabir, J., Elelu, N., Enemaku, O and Tseggai, T. (2014). Application of Sustainable Livelihood Concepts in Promoting Biosecurity in Free Range Poultry in Rural Nigeria. *Journal of Agricultural Extension and Rural Development*, 6 (8): 360-367

Udoh, E. J. and Etim, N. A. 2007. Application of Stochastic Production Frontier in Estimation of Technical Efficiency of Cassava Based farms in Akwa Ibom State, Nigeria. *Agricultural Journal*. 2(6): 731-735

Umali, D., Narrod C. and Deininger, K. (1994). Private Sector Development in Agriculture. Constraints, Opportunities and New Approaches: Paper Prepared for the Private Sector Development of the World Bank.