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Do Rural Livestock Farmers Have Knowledge of Organic Livestock Farming Practices? Lesson from Southeast Nigeria

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Abstract

At global level, the use of inorganic feeds, veterinary drugs amongst others can significantly increase farm output in various livestock production systems. However, in recent times, quality-conscious consumers are increasingly seeking environmentally safe and chemical-residue free healthy livestock foods which organic production methods are said to ensure. Livestock Organic farming can offer promising opportunities for ensuring safe food, environmental sustainability, high livestock yield and income. Incidentally, empirical evidence on present discourse is still relatively very little. Although, a significant contribution has been made by various scholars, regrettably, these studies did not dwell on organic livestock practices and their knowledge level in South-east, Nigeria. Therefore, this presents a dearth in research and became increasingly pertinent that the study was systematically undertaken. A multistage and purposive random sampling procedure was used in the selection of 504 respondents who are organic livestock farmers. Data collected was analyzed using mean score analysis. Result shows that farmers had knowledge on practices of extensive system of livestock/poultry farming ($\bar{X}=3.49$); provision of natural air ($\bar{X}=3.50$); provision of natural water sprinkling during hot weather ($\bar{X}=3.50$); rearing animal without antibiotics ($\bar{X}=3.56$); and treating injured animals organically ($\bar{X}=3.48$) among others. Incidentally, majority of the livestock farmers lacked knowledge of how to induce ovulation for animals without drugs ($\bar{X}=1.88$). The inducement of ovulation for farm animals is one of the livestock organic methods used in forcing farm animals to come on heat/ovulation for quick multiplication. This method is harmful both for the animal an eventual consumer. Therefore, it is necessary that extension agents who are subject matter specialist (SMS) in livestock organic farming educate farmers on how to induce ovulation to farm animals organically with support from the government and farmers cooperative membership resources as these would significantly reduce harmful drugs injected to animal for quick ovulation and preserve the life span of the animal and consumers of the animal.

Keywords: Livestock, Organic Farming, Likert Scale Type, Rural farmers, and South-east, Nigeria

1. Introduction

Globally and particularly across Nigeria, current food production system may produce impressive quantities, but the health and environmental costs it brings have continued to demonstrate its limits [1, 2]. Organic farming provides basis for maintaining environmental goods and services at the farm level. According to [3] organic farming promotes ecological resilience, improved biodiversity, healthy management of farms and the surrounding environment, and builds on community knowledge and strength. It is therefore on this backdrop that organic farming is steadily gaining popularity all over the world and has continued to receive increasing support from government and the private sector [4, 5]. Therefore, from the researchers view, organic livestock farming is a system that rears, processes and preserves livestock without any form of chemical such as feed additives, growth, ovulation and appetite inducement among others. Livestock produce from organic farming is always one-hundred percent (100%) organic and un-denatured. In addition, rural farmers can be seen as farmers living in the rural areas, most of them have low level of education, low access to information, their major occupation is subsistence farming with low farm size and farm input. They are also generally characterized by poverty, poor health condition and poor standard of living. For the purpose of the present study rural livestock farmers rear livestock, keep poultry, and engage in other wild animal hunting among others. Moreover, livestock organic farming production can offer promising opportunities for ensuring safe food, environmental sustainability, high livestock yield and income. Incidentally, empirical evidence on the present discourse is still relatively very scarce. Although, a significant contribution has been made by various scholars [6–8], regrettably, these studies did not dwell on organic livestock practices and their knowledge level in South-east Nigeria. Therefore, this presents a dearth in research and became increasingly pertinent that the study was systematically undertaken.

2. Methodology

The study was conducted in South-East, Nigeria. South-East comprised of five states, namely, Abia, Anambra, Ebonyi, Enugu and Imo (**Figure 1**). It has an estimated land mass of 32,610 km² and a population of 22,583,076 [9]. South-East lies between longitude 2°61¹ and 6°32¹ East and latitudes 6°74¹ and 8°15¹ North of Equator with the mean annual temperature ranges from 21.6°C to 32.4°C while the annual rainfall ranges from 720 mm to 1440 mm in the rainforest region [10, 11]. The State has good climatic condition suitable for livestock farming and a good proportion of the population are essentially livestock farmers. A multistage and purposive random sampling procedure was used in the selection of respondents who are involved in organic livestock farmers. Firstly three (3) States namely Abia, Ebonyi and Enugu were randomly selected from the five (5) geopolitical zone of South-East, Zone of Nigeria. Secondly, three Local Government Areas (LGAs) were purposively selected from each of selected States giving a total of nine (9) local government areas for the study. Purposive sampling was used to select only farmers who are practicing mainly organic farming. Thirdly, three (3) communities was purposively selected from each of the nine (9) selected LGAs based on the concentration of organic farmers to give a total of twenty-seven (27) communities. Finally, a stratified random sampling technique was used to select fourteen (14) livestock farmers from each of the 27 selected communities to give a total sample size of five-hundred and four (504) livestock farmers for the study. The list of livestock farmers in the communities, which forms the sample frame, was obtained

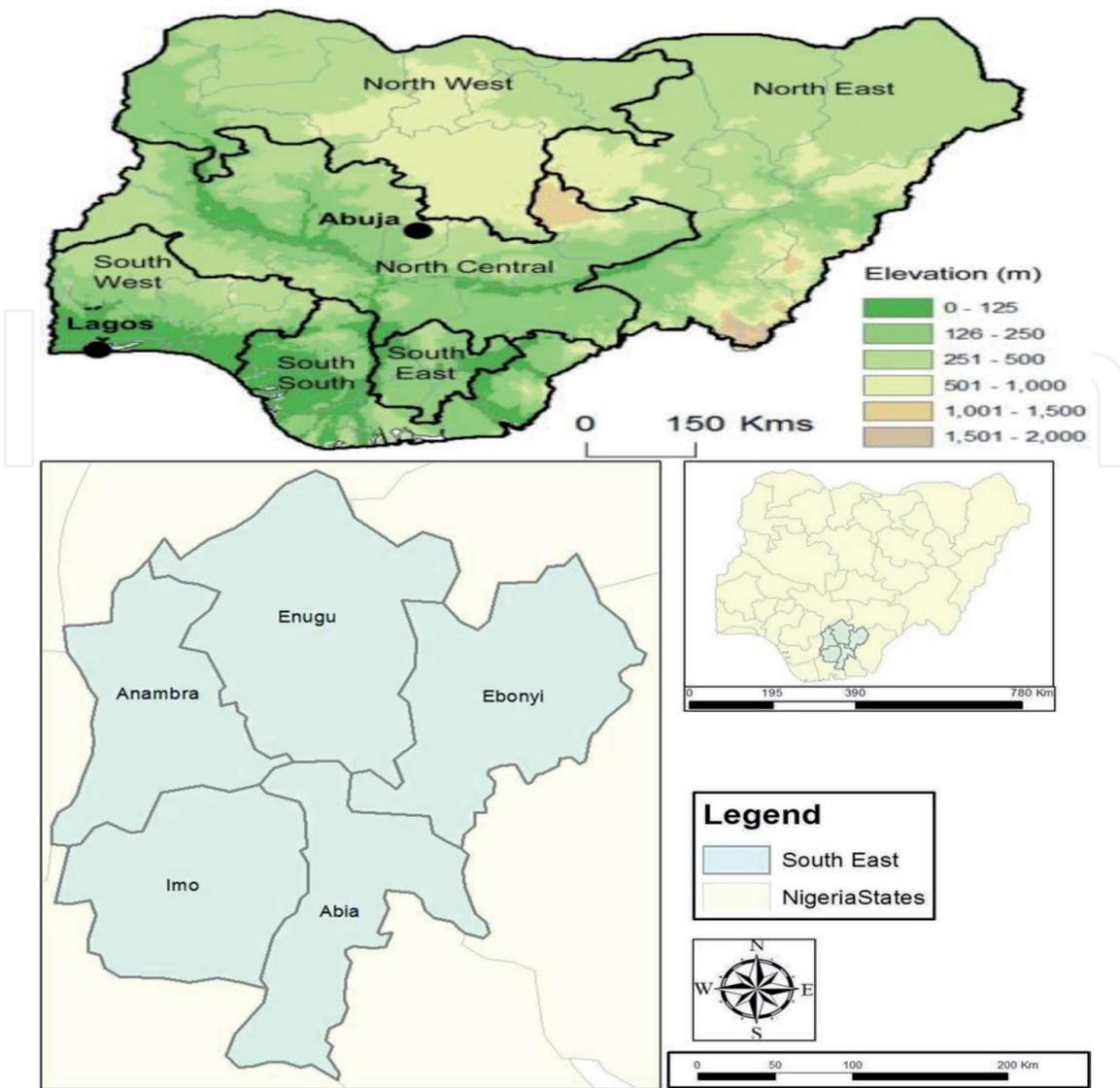


Figure 1.
 Map of Nigeria showing the study area.

from the zonal extension agents of each of the State Agricultural Development Programme in the selected States. Data collected were analyzed using likert scale type. A well structured questionnaire was the main tool for data collection. Data collected were analyzed using likert scale type. The weighted mean was given below as follows:

$$X_w = \frac{\sum_{j=1}^5 ni(5i)}{n}$$

Where X_w = Weighted Mean Score.

n = No: of respondents.

The various attributes were rated in a 4- point likert scale type of questions of Very High Knowledge (VHK) (4); High Knowledge (HK) (3); Moderate Knowledge (MK) (2) and No Knowledge (NK) (1). Using the method of mean score analysis, a discriminatory mean of 2.50 was produced. The mean value of each attribute equal to or above ($\bar{x} = \geq 2.50$) was regarded as an accepted decision while attributes with mean value less than ($\bar{x} = \leq 2.50$) was regarded as a rejected decision (**Table 1**).

States in South-east	Agricultural Zone of Selected South east State	Total Number of Local Government Area Selected from each of the agricultural zone in South east	Total Number of Communities Selected from each of the agricultural zone in South east	Total Number of Farmers selected per community Livestock
a. Abia	Ohafia	3	3x3	4x14
State 1	Umuahia	3	3x3	4x14
	Aba	3	3x3	4x14
Sub-total	03	09	27	168
b. Ebonyi	Ebonyi-South,	3	3x3	4x14
State 2	Ebonyi-North	3	3x3	4x14
	Ebonyi-Central	3	3x3	4x14
Sub-total	03	09	27	168
c. Imo	Orlu	3	3x3	4x14
State 3	Owerri	3	3x3	4x14
	Okigwe	3	3x3	4x14
Sub-total	03	09	27	168
Aggregate Total	15.00	27.00	81.00	504

Source: Field Survey Data, 2019.

Table 1.
Sampling and sample proportion for the study.

3. Results and discussion

3.1 Socio-economic characteristics of livestock farmers

Results in **Table 2**, showed that majority (58.53%) of the farmers fell within the age bracket of 41–50 years. The average age was 44.00 years. The farmers are still young and in an active age. Younger farmers are modern, innovative, full of physical vigor and ever-ready to try new technology faster than their older counterpart in organic farming practices. Additionally, younger farmers are also ready mentally and physically to engage in farming activities in a bid to alleviating poverty and becoming more self-reliant than their older counterpart. The finding is in agreement with the study of [7] who pointed-out that younger farmers are more involved in farming activities than older farmers in South-east Nigeria and that older farmers are not always enthusiastic about new farm technologies, especially if the benefits are not expected in the near future, but at the same time, farmers with advanced age are associated with more experience. **Table 2**, also indicates that greater proportion (61.30%) of the farmers were males. The finding implies that both sex are involved in organic farming activities but males were more in number than females in the area. This is true and could be attributed to the fact that male seems to have more access to agricultural productive inputs such as farmland, economic crops, agricultural extension services and farm credit than female in the area. Furthermore, the high number of male could also be associated to the fact than male have more physical energy to withstand the stress and strain involved in organic farming activities than female in the area. The result is

Age (Years)	Frequency	Percentage (%)	Mean (X)
21–30	8	1.58	
31–40	49	9.72	
41–50	295	58.53	
51–60	108	21.42	
61–70	32	6.34	
71–80	12	2.38	
Total	504	100.00	44.00 years
Sex	Frequency	Percentage (%)	
Male	309	61.30	
Female	195	38.69	
Total	504	100.0	
Educational Level	Frequency	Percentage (%)	
No formal education	16	3.174	
Primary	161	31.94	
Secondary	291	57.73	
Tertiary	36	7.14	
Total	504	100.00	13.00 years
Marital Status	Frequency	Percentage (%)	
Married	270	53.57	
Single	157	31.15	
Widowed	54	10.71	
Divorced	23	4.56	
Total	504	100.0	
Farming Experience	Frequency	Percentage (%)	
01–10	15	2.97	
10–19	34	6.74	
20–30	284	56.34	
31–40	101	20.03	
41–50	59	11.70	
51–60	11	2.18	
Total	504	100.00	29.00 years
Household Size (Number of Persons)	Frequency	Percentage (%)	
1–2	3	0.59	
3–4	14	2.78	
5–6	29	5.78	
7–8	124	24.60	
9–10	222	44.04	
11–12	101	20.03	
13–14	11	2.18	
Total	504	100.00	8.00 persons

Age (Years)	Frequency	Percentage (%)	Mean (X)
Membership of Cooperatives			
Member	398	78.96	
Non-member	106	21.03	
Total	504	100.0	
Number of Visit			
Not at all	147	29.67	
Once in a fortnight	283	56.15	
Once in a month	47	9.32	
Twice in a year	23	4.56	
Once in a year	4	0.79	
Total	504	100.0	2.0 times per month
Access to Farm Credit			
Access	401	79.56	
No-access	103	20.44	
Total	504	100.0	
Farm Size (Herds)			
Poultry	493*	97.81	
Pig	382*	75.79	
Goat	131*	25.99	
Sheep	73*	14.48	
Cattle	21*	4.16	
Annual Farm Income (N)			
100,000-200,000	13	2.58	
200,001-300,000	36	7.14	
300,001-400,000	28	5.56	
400,001-500,000	23	4.56	
600,001-700,000	74	14.70	
700,001-800,000	96	19.05	
800,001-900,000	223	44.25	
900,001-1,000,000	11	2.18	
Total	504	100.0	N860,700.00 (2,259.77USD)

*Multiple Responses were recorded; Source: Field Survey Data, 2020.
2.0 Knowledge Level of Farmers on Livestock Organic Farming Practices.

Table 2.
Socio-economic characteristics of livestock farmers.

in line with the findings of [12] who reported that males constituted the greater proportion of those involved in farming activities in South-East, Nigeria. **Table 2** also shows that majority (57.73%) had secondary education. The mean education level was 13.00 years and equivalent to secondary school education. The finding indicates that approximately 96.83% of the farmers had trainings in formal educational institutions which no doubt increases their literacy levels in understanding the importance of organic farming. It is also expected that the higher level of

education would contribute significantly to decision making regarding the appropriate use of organic farming practices in the area. Additionally, exposure to higher level of education is positively and significantly related to knowledge, understanding and use of organic farming practices among farmer. The finding is supported by the study of [13] who pointed the need for education in increasing farmers knowledge in order to facilitate the organic farming transition process. The study also shares view with the finding of [14] who asserted that higher education correlates positively with understanding, use and evaluation of new organic farming practices. Marital status is presented in **Table 2**. It shows that greater proportions (53.57%) of the farmers were married. This is an indication that married individual were more involved in organic farming activities in South-east Nigeria than their other counterpart. This could be as a result that married farmers tends to have access to farmland, economics trees, labour from households and access to farm credit. This finding supports the work of [15] who opined that married farmers tend to have easy access to production variables such as land and large family size which are traditionally owned and provided by household heads (husbands) to compliment family labour, reduce the cost of hired labour and improve their production. Farming experience is computed in **Table 2** and it revealed that higher proportion (56.34%) of the farmers had between 20 and 30 years of farming experience. The mean farming experience was 29.00 years. This implies that the farmers were experienced and may have been practicing several organic farming methods in the area. Having experience is one of the most useful managerial resources to organic farming. The finding is strengthened by the study of [16] who reported that experience in agribusiness enhances performance, decision making, better knowledge of climatic conditions and improve efficient use of productive resources. The result of the farmers distribution based on household size is compiled in **Table 2**. It shows that approximately 44.04% of the farmers had household size of between 9-10persons. The mean household size was 8.0 persons. This shows the farmers had large households and it is significant advantage in farming. It is expected that the very moderate household size of the farmers would serve as a source of labour in practice of several organic farming methods in the area. This findings support the result of [17] who reported that large household size is a proxy to labour availability, ensure ease allocation of resources and reduce the cost of hired labour. **Table 2** shows that greater proportion (78.96%) of the farmers in the area belong to one form of cooperative society or the other. Understanding the important of cooperative society in farming is not expected to be a challenge to the farmers in the area. Farmers that belong to cooperative society have access to relevant and up-to-date information on organic farming, farm credit and exchange of labour. The finding is supported by the result of [18] who argued that the more active the farmers are in their involvement in the farmer association, the more information of farm activities carried out and agricultural input distribution they have compared to those who do not join the association. The result of farmers distribution based on extension contact is presented in **Table 2**. It indicates that reasonable proportions (56.15%) of the farmers were visited once in a fortnight. The mean number of visits per month was 2.0. This shows that the farmers had low extension contact which may not support development of use of organic farming methods. The study of [19] asserted that extension contact promote knowledge of farmers on modern farming methods which improves their production and standard of living. **Table 2** also shows that greater proportion (79.56%) of farmers in the area had access to farm credit. This could be one of the most important factors in organic farming as majority of farmers have access to credit facilities to ensure easy purchase of farm input and expansion of farm. The study of [20] opined that the coefficient of access to farm credit was positive and significantly related to the

improved production of farmers. The result of livestock farmers distribution based on farm size is displayed in **Table 2**. It shows that majority (97.81%) of the farmers in the study area were involved in poultry farming. Additionally, poultry sector in Nigeria accounts for about 58.2% of overall livestock production as it offers the nippiest profit to investment expenditures in livestock production enterprise (21). Finally, **Table 2**, it indicates that majority (44.25%) of the farmers in the study

S/No	Livestock organic farming practices	VHK	HK	MK	NK	Mean(\bar{x}) (≥ 2.50)	SD	Decision
1	Knowledge of extensive system of livestock farming	294 (58.33)	164 (32.54)	44 (8.73)	2 (0.40)	3.49	0.81	Accepted
2	Knowledge of provision of natural air	330 (65.48)	106 (21.03)	60 (11.90)	8 (1.59)	3.50	0.76	Accepted
3	Knowledge of provision of natural water sprinkling during hot weather	272 (53.97)	208 (41.27)	18 (3.57)	6 (1.19)	3.48	0.66	Accepted
4	Knowledge of rearing animal without antibiotics	326 (64.68)	134 (26.59)	42 (8.33)	2 (0.40)	3.56	0.89	Accepted
5	Knowledge of treating injured animals without drugs	302 (59.92)	146 (28.97)	52 (10.32)	4 (0.80)	3.50	0.85	Accepted
6	Knowledge of feeding animals without feed inducement	334 (66.27)	98 (19.44)	64 (12.70)	16 (3.17)	3.52	0.87	Accepted
7	Knowledge of inducing ovulation for animals without drugs	18 (3.57)	22 (4.37)	340 (68.25)	124 (24.60)	1.88	0.14	Rejected
8	Knowledge of allowing animals give birth naturally without drug inducement	360 (71.43)	96 (19.05)	38 (7.54)	10 (1.98)	3.60	0.79	Accepted
9	Knowledge of animal feeding using 100% organic feeds	262 (51.98)	200 (39.68)	24 (4.76)	14 (2.78)	3.41	0.67	Accepted
10	Knowledge of use of purely local breed of livestock	338 (67.06)	110 (21.82)	44 (8.73)	12 (2.38)	3.51	0.76	Accepted

*Discriminatory index: Cut off point $\bar{x} \geq 2.50$ Accepted; $\bar{x} \leq 2.50$ is Rejected; *Figures in parenthesis are percentage; Field Survey Data, 2020.*

Keys; VHK: Very High Knowledge; HK: High Knowledge; MK: Moderate Knowledge; NK: No Knowledge; SD: Standard Deviation.

Table 3.
Knowledge level of farmers on livestock organic farming practices.

area had an annual farm income of between N800,001–900,000. The mean annual farm income was N860,700.00 (2,259.77USD) while monthly farm income was estimated to be N 71, 725.00. This is relatively high and above the Nigeria Monthly National Minimum wage of N30,000.00. This is relatively high income could be attributed to farmers' practice of organic farming. It also shows an encouraging income realized from the practice of organic farming. The study of reported that farmers with higher farm income will make better decision, use necessary productive inputs, realize huge yield/output and be more relatively efficient than their counterparts who have low farm income.

Result of farmers distribution based on level on knowledge of livestock organic farming practices is displayed in **Table 3**. The various attributes were rated in a 4- point likert scale type of questions of Very High Knowledge (VHK) (4); High Knowledge (HK) (3); Moderate Knowledge (MK) (2) and No Knowledge (NK) (1). Using the method of mean score analysis, a discriminatory mean of 2.50 was produced. The mean value of each attribute equal to or above ($\bar{x} = \geq 2.50$) was regarded as an accepted decision while attributes with mean value less than ($\bar{x} = \leq 2.50$) was regarded as a rejected decision. The values of standard deviation (SD) denote the degree of variation in the responses of the farmers. The standard deviation value which ranged from 0.60 and above indicated that farmers were in agreement in their level of knowledge of organic farming practices. Additionally, all the items were rated high and had an acceptable overall discriminatory score ($\bar{x} = \geq 2.50$) except the attribute of having Knowledge of inducing ovulation for animals without drugs ($\bar{x} = \leq 1.46$) and Knowledge of use of purely local breed of livestock ($\bar{x} = \leq 1.76$) which had a low acceptance and poor rating. The low level of knowledge and acceptability of the first attribute may be due to lack of knowledge of the farmers to successfully induce ovulation without drugs in farm animal. It encompasses practices like administration of hormone to non-use of biostimulation. In a similar way, farmers poor knowledge of use of purely local breed of livestock could be attributed to the fact that Nigeria local breed (chick, goat, or sheep) are usually small in size, process less meat, egg and grows slowly. Although the study of [6] reported that indigenous poultry species represent valuable resources for livestock development because their extensive genetic diversity allows for rearing of poultry under varied environmental conditions, providing a range of products and functions. Thus, great genetic resources embedded in the indigenous poultry await full exploitation that will provide basis for genetic improvement and diversification to produce breeds that are adapted to local conditions for the benefit of farmers and still less prefer to exotic breed by livestock farmers.

n = 504.

4. Conclusion and recommendation

Conclusively, result revealed that farmers have knowledge of the following practices extensive system of livestock/poultry farming; provision of natural air; treating injured animals without drugs; treating injured animals without drugs; provision of natural water sprinkling during hot weather; rearing animal without antibiotics; animal feeding using 100% organic feeds among other various livestock farmers possesses in livestock organic farming. Incidentally, majority of the livestock farmers have low knowledge of how to induce ovulation for animals without drugs.

Recommendation

Therefore, the study recommends that government effort should focus on intensifying more knowledge building of farmers on organic livestock practices through strengthened agricultural extension service system. This would not only improve farmers' practice of organic livestock production but also increase their income, standard of living and reduction of health and environmental hazard associated with the use of inorganic farming in the area.

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