



## AWARENESS, KNOWLEDGE AND UTILIZATION OF IMPROVED PIG PRODUCTION TECHNOLOGIES AMONG FARMERS IN ABIA STATE, NIGERIA

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### Abstract

This study evaluated awareness, knowledge and utilization of improved pig production technologies among farmers in Abia State, Nigeria. A multistage random sampling procedure was used to select 57 pig farmers for the study. Structured questionnaire and interview schedule were used to collect data which were analysed using frequency counts, percentages, mean scores and Pearson's Product Moment Correlation analysis (PPMC). The result of the study revealed that most of the respondents were males (73.7%), with average age of 36 years, 93.0% were formally educated and 71.9% married. They had an average household size of 9 persons, 7 years of farming experience and 54.4% had access to credit. The result further revealed that among the most important technologies farmers were aware of include; vaccination and deworming (100% each) and control of ecto-parasites (91.2%). The respondents were very knowledgeable about deworming (3.74), vaccination (3.51) and control of ecto-parasites (3.07). The grand mean of 2.66 indicate that the farmers were knowledgeable about the improved pig production technologies in the study area. The result also showed that deworming (3.35) and control of ecto-parasites (3.23) were the most utilized technologies and improved housing system (3.09). The correlation coefficient of 0.483 indicates positive and significant relationship between level of knowledge and utilization of the technologies. The results therefore call for policies aimed at training and re-training of farmers to increase farmers' knowledge and skills for increased and sustained utilization of these technologies in the study area.

**Keywords:** *Utilization, Knowledge, Awareness, and Improved technology*

### Introduction

Rapid increase in world population is a threat to food security. The World population is expected to be over 9 billion people by the year 2050. The rate of population growth is far more than the rate of increase in food production and according to FAO, food production must increase by 70% in order to meet global food need by 2050. As at 2018, the prevalence of food insecurity in Sub Saharan Africa was 57.7% (FAO, 2019). To feed the rapidly expanding human population, balanced meals that are both plant and animal based will continue to be in great demand due to their contribution to food security and nutrition. Population growth, urbanization, income growth, and changes in diets of people are predicted to fuel massive demand for food of animal origin.

Pig production is one of the community level livestock programmes which the Nigerian government has embarked upon to enhance food security (Adetunji and Adeyemo, 2012). The choice of pig among other livestock animals could be because of its potential to

contribute to economic development and its great advantages over other animals in terms ability to multiply extensively within a short period and ability to provide tasty meat, rich in crude protein which is highly nutritious among other products. Other advantages of pig production include; relatively low initial investment, high birth rate (fecundity - large number of litters per birth), and fast growth rate which are better than those of any other animal and can only be compared to birds. They have short gestation period (pregnancy lasts for 3 months, 3 weeks and 3 days) and the ability to give birth twice a year. Pigs are very good converters of feed to meat and the meat to bone ratio is very high. They bring good returns on investment (Dietze, 2012; Igwe *et al.*, 2013).

Pigs are mammals of the *Suidae* family and *Artiodactyla* order. Specifically, they are domestic animals known scientifically as *Sus scrofa domestica*. These monogastric animals with high rate of productivity have the ability to utilize a host of agro-industrial by-products and crop residues, with little or no

processing and at minimal cost (Igwe *et al.*, 2013). These great attributes of pigs, make the industry an important arm of the livestock sector which the nation can effectively utilize to help her meet increasing demand for animal protein (Aminu and Akhigbe-Ahonkhai, 2017). In Nigeria and other developing countries, the piggery industry is faced with lots of challenges resulting in its low productivity and inefficiency in resource use. These challenges include high production costs, low profit margins and high feed bills (Dietze, 2012). Other factors that have militated against pig production in Nigeria include: disease outbreak, inadequate technical assistance in the form of extension services, inaccessibility of pig farmers to credit facilities, lack of adequate supply of genetically sound breeders, high cost of feed, poor infrastructural facilities, fear of inadequate market for piggery products, absence of pig product processing industry in Nigeria, and the belief that pigs are dirty and constitute a health hazard (Aminu and Akhigbe-Ahonkhai, 2017).

These challenges have necessitated constant research to ensure improvement in all areas of pig production. Technologies have been developed in the management system, selection of brood stock, feeding methods, housing, diseases and pest management. These generated technologies from research are expected to get to the farmers through extension. Extension agents communicate to farmers the outcome of research through various channels and effective communication leads to adoption of innovation (Nwachukwu, 2014). If proper awareness is created and pig farmers are duly informed and trained to be knowledgeable about the innovations in pig production developed by research and communicated by extension, it is assumed that utilization will be high and high utilization of these improved technologies is expected to bring about improvement in pig productivity. However, it is believed that if farmers are not making efficient use of existing technologies, low production will be recorded both in food and livestock (Parke, 2015). It is therefore necessary to study the respondents' awareness of the existence of these improved production technologies, their level of knowledge and utilization of these technologies in the study area.

**Methodology**

This study was carried out in Abia State. Abia State is one of the States in South-East Nigeria created on the 27<sup>th</sup> of August 1991 from part of Imo State. It is made up of 17 Local Government Areas (LGAs) and is divided into three Senatorial zones namely; Abia Central, Abia South and Abia North. A multi-stage sampling procedure was employed in the selection of respondents for the study. The first stage was the purposive selection of Abia Central Senatorial Zone. This zone was selected because of high production, sale and consumption of pork by the residents. The second stage was the purposive selection of three Local Government Areas (LGA) -Umuahia North, Umuahia South and Isiala Ngwa North - from the six LGAs that make up the zone due to prominence of pig farms in these areas and the

third stage was the random selection of sixty (60) pig farmers across the three (3) LGAs in no definite order because there was no sampling frame. In all, sixty respondents were selected for detailed study. The primary data collected with structured questionnaire and interview schedule were analysed using descriptive (frequencies, percentages and mean scores) and inferential (PPMC) statistics. Of the sixty copies of questionnaire distributed, only fifty-seven could be retrieved and the content analysed.

**Measurement of variables**

To ascertain the farmers' awareness of improved pig production technologies, a list of the technologies was presented to the respondents to indicate 'Yes' if they were aware of the existence of the technology and 'No' if otherwise. To determine the farmers' level of knowledge of the listed technologies, a four-point Likert-type scale with options of not knowledgeable, fairly knowledgeable, knowledgeable and very knowledgeable, scaled 1 to 4 were used to generate mean scores. To ascertain the farmers' level of utilization of the listed technologies, a four-point Likert-type scale of never, sometimes, often and very often which were also scaled from 1-4 were used to generate mean scores. The mean scores generated on the four-point scales were used for decision making. For level of knowledge, mean scores above or equal to the midpoint of 2.5 were regarded as knowledgeable, while scores below 2.5 were regarded as not knowledgeable. For level of utilization, means scores above or equal to the midpoint of 2.5 were regarded as highly utilized and scores below 2.5 were regarded as not utilized. The mean score ( $\bar{X}$ ) of each item was computed by multiplying the frequency of each response pattern with its appropriate nominal value and dividing the sum with the number of respondents to the items. This can be summarized with equation below.

$$\bar{x} = \sum fx/n \dots\dots\dots(1)$$

- Where;
- $\bar{x}$ = mean score
- $\Sigma$  = summation
- f= frequency
- x = Likert nominal value
- n= number of the respondents

$$\bar{X} = \frac{1+2+3+4}{4} = 2.5 \dots\dots\dots (2)$$

The relationship between level of knowledge and level of utilization of improved pig production technologies in the study area was estimated using PPMC (Pearson product-moment correlation), expressed thus:

$$r = \frac{n\sum XY - (\sum X)(\sum Y)}{\sqrt{((n\sum X^2) - (\sum X^2)(n\sum Y^2) - (n\sum Y^2)^2)} \dots\dots(3)$$

- Where;
- r = correlation coefficient
- Y = level of knowledge of improved pig production technologies (mean counts, ranging 1-4)
- X = level of utilization of improved pig production technologies (mean counts, ranging 1-4)
- n = sample size

## Results and Discussion

### Socio-economic characteristics of respondents

The results in Table 1 show the socio-economic distribution of the pig farmers in the study area. The result revealed that majority (73.7 %) of the pig farmers were males, while 26.3% were females. This could be because of the strenuous nature of pig production, and it corroborates with the findings of Osondu *et al* (2014) that more male pig farmers operated in Abia State compared to their female counterparts. The result also showed that the average age of the respondents was 36 years. Majority of the pig farmers (71.9%) were married, 93% had some form of formal education and 63.2% had household size of more than 8 persons. The respondents had been in the pig farming business for about 7 years. This implies that most of the pig farmers were literate and within their economically active age for optimum productivity. At this stage, the

tendency for them to be very inquisitive and receptive to new ideas/innovations in order to meet personal and family needs is very high, and this is also likely to increase production. This finding is in line with Obayelu, Ogunmola and Sowande (2017), younger age and education are factors that will likely contribute to high returns on pig farmers' production level and their ability to adopt new production technologies. The study further revealed that 56.4% of the respondents had not accessed any form of credit to boost their business while majority (73.1%) of those who had accessed credit did so from the informal finance sectors (friend and relatives and local money lenders). Funding is the bane of most businesses including livestock production. Anyiro and Oriaku (2011) noted that informal sources of credit are a huge set back to any agro-based enterprise because it is usually small in amount and cannot afford capital intensive technologies.

**Table 1: Distribution of respondents according to socio-economic characteristics (n = 57)**

Variables	Frequency	Percent	
<b>Sex</b>			
Female	15	26.3	
Male	42	73.7	
<b>Total</b>	<b>57</b>	<b>100.0</b>	
<b>Age</b>			
≤ 20	3	5.2	<b>36years</b>
21-30	10	17.5	
31-40	21	36.8	
41-50	16	28.1	
>50	7	15.4	
<b>Total</b>	<b>57</b>	<b>100.0</b>	
<b>Marital status</b>			
Single	10	17.5	
Married	41	71.9	
Widowed	3	5.3	
Divorced	3	5.3	
<b>Total</b>	<b>57</b>	<b>100.0</b>	
<b>Level of education</b>			
No Formal Education	4	7.0	
Primary	20	35.1	
Secondary	6	10.5	
Tertiary	27	47.4	
<b>Total</b>	<b>57</b>	<b>100.0</b>	
<b>Household size</b>			
1-4	6	10.5	
5-8	15	26.3	
9-12	36	63.2	<b>8.6 persons</b>
<b>Total</b>	<b>57</b>	<b>100.0</b>	
<b>Years of pig farming experience</b>			
1-3	15	26.3	
4-6	5	8.8	<b>7.2 years</b>
7-9	7	12.3	
>9	30	52.6	
<b>Total</b>	<b>57</b>	<b>100.0</b>	
<b>Access to credit</b>			
No	31	54.4	
Yes	26	45.6	
<b>Total</b>	<b>57</b>	<b>100.0</b>	
<b>Sources of credit</b>			
Relatives and friends	12	46.2	
Local money lenders	7	26.9	
Banks	7	26.9	
<b>Total</b>	<b>26</b>	<b>100.0</b>	

Source: Field survey data, 2019

**Awareness of improved pig production technologies**  
 Respondents' awareness of improved pig production technology packages is presented in Table 2. From the result, all the respondents were aware of vaccination and deworming technologies, 91.2% were aware of ecto-parasites control technologies and 87.7% of improved feeding technologies in pig production. It was also observed that 84.2% were aware of improved housing system and artificial insemination technologies each. The table further showed that 71.9% of the pig farmers were aware of improved pig breeds, 52.6% for improved servicing technology and 47.7% for improved weaning

technologies. These technologies are meant to enhance pig production, make animal protein more readily available and help curb food insecurity. Majority of the respondents (79.9%) were aware of the existence of all these technologies. Awareness is a prerequisite to knowledge and utilisation and creates the desire for more information. Additional information leads to increases in knowledge which will either encourage or discourage utilization. According to Akinbile, Akwuiwu and Alade (2014), since awareness comes before access and utilization, it is most likely to enhance adoption of technologies.

**Table 2: Distribution of Pig Farmers Based on Awareness of Pig Production Technologies (n=57)**

Technology	Frequency	*Percentage
Vaccination	57	100.0
Deworming	57	100.0
Control of ecto-parasites	52	91.2
Improved feeding	50	87.7
Improved housing system	48	84.2
Artificial insemination	48	84.2
Improved pig breeds	41	71.9
Regulated Servicing technology	30	52.6
Improved weaning technology	27	47.4
<b>Grand percentage</b>		<b>79.9</b>

Source: Field survey data, 2019

\*Multiple responses

**Level of knowledge of improved pig production technology**

The result in Table 3 revealed that many (57.9%) of the respondents were knowledgeable of improved feeding technologies (2.70), 47.4% of ecto-parasite control technologies (3.07), 50.9% and 77.2% of vaccination (3.51) and deworming (3.74) technologies respectively. The result further revealed that 47.4% of the pig farmers were knowledgeable of improved pig breeds (2.30), and 57.9% of improved housing (2.74). The grand mean score (2.66) of the knowledge index (67%) revealed that the respondents were moderately knowledgeable of the

improved technologies available for pig production. Knowledge can be acquired from information received through formal training or from informal discussion. Whatever the source, proper knowledge enhances utilization of technologies. This implies that the pig farmers acquired necessary information that enhanced their knowledge and put them in a position to make decisions on utilization and adoption. According to Chaudhary *et al.*, (2013), knowledge is one of the important prerequisite for the covert and overt behaviour of an individual.

**Table 3: Distribution of Pig Farmers Based on level of Knowledge of Pig Production Technologies (n=57)**

	VK(4)	K (3)	FK (2)	NK(1)	Σfx	Mean	Decision
Improved feeding	7 (12.3)	33(57.9)	10(17.5)	7(12.3)	154	2.70	Knowledgeable
Control of ecto-parasites	27(47.4)	12(21.1)	13(22.81)	5(8.8)	175	3.07	Knowledgeable
Vaccination	29(50.9)	28(49.1)	0	0	200	3.51	Knowledgeable
Deworming	44(77.2)	12(21.1)	0	1(1.8)	213	3.74	Knowledgeable
Improved breeds	3(5.3)	27(47.4)	11(19.3)	16 (28.1)	131	2.30	Not Knowledgeable
Improved housing system	9(15.8)	33(57.9)	6(10.5)	9 (15.8)	156	2.74	Knowledgeable
Improved weaning technology	0	8(14.0)	20(35.1)	29 (50.9)	93	1.63	Not Knowledgeable
Improved Servicing technology	4(7.0)	19 (33.3)	7(12.3)	27(47.4)	114	2.00	Not Knowledgeable
Artificial insemination	9(15.8)	14(24.6)	18(31.6)	16(28.1)	130	2.28	Not Knowledgeable
<b>Grand mean</b>						<b>2.66</b>	
<b>Knowledge index</b>						<b>0.67</b>	

Source: Field survey data, 2019

Mean scores ≥ 2.5 = knowledgeable; mean scores <2.5 = not knowledgeable

VK =Very knowledgeable, K = Knowledgeable, F = Fairly Knowledgeable, NK =Not Knowledgeable

### Utilization of pig production technologies

Results of Pig production technologies utilized by pig farmers in the study area are presented in Table 4. The findings of the study showed the grand mean score on level of utilization was 2.70, implying that from a general perspective; the technologies were highly utilized in the study area. The result revealed that majority of the respondents (63.2%) often used improved feeding technology (2.79) to manage their piglets, while, 52.6% employed ecto-parasite control technology (3.23) very often. Furthermore, 63.2% and 66.7% very often and often used improved deworming (3.35) and improved breeds (2.81) technologies. It was also observed from the result that 66.7% of the respondents often provided improved houses (3.09) for their pigs, while 63.2% sometimes engaged regulated

servicing of sows by boars. However, use of improved weaning technologies (2.28), vaccination (2.35) and artificial insemination (1.64) had low utilisation by the pig farmers in the study area. The utilization index of 0.6758 indicates that 67.6% of the technologies were utilized by the farmers. By implication the improved technologies were moderately utilized. This can be because of source and appropriate information. Utilization entails applying acquired knowledge with the expectation of achieving the desired result. Lending credence to this, Zanu, Antwiwaa and Agyemang (2012), noted that to increase the level of adoption of improved technologies in pig farming, farmers are required to be exposed to many sources of information as possible, to make them aware of these technologies.

**Table 4: Distribution of Pig Farmers according to level of Utilization of Pig Production Technologies (n = 57)**

	Very Often (4)	Often(3)	Sometimes (2)	Never (1)	Σfx	Mean	Decision
Improved feeding	6 (10.5)	36 (63.2)	12(21.1)	3(5.3)	159	2.79	High Utilization
Control of ecto-parasites	30(52.6)	12 (21.1)	13(22.8)	2(3.5)	181	3.23	High Utilization
Vaccination	13(22.8)	12(21.1)	14 (24.6)	18 (31.6)	134	2.35	Low Utilization
Deworming	36(63.2)	13(22.8)	0	8 (14.0)	191	3.35	High Utilization
Improved breeds	4(7.0)	38(66.7)	15(26.3)	0	160	2.81	High Utilization
Improved housing system	12(21.1)	38(66.7)	7(12.3)	0	176	3.09	High Utilization
Improved weaning technology	9(15.8)	14(24.6)	18(31.6)	16 (28.1)	130	2.28	Low Utilization
Improved Servicing technology	6(10.5)	36(63.2)	12(21.1)	3(5.3)	159	2.79	High Utilization
Artificial insemination	0	8(14.0)	20 (35.1)	29(50.9)	93	1.64	Under utilized
<b>Grand Mean</b>						<b>2.70</b>	
<b>Utilisation index</b>						<b>0.6758</b>	

Source: Field survey data, 2019

Note: Mean Score  $\geq 2.5$  = High Utilization, Mean Score less than 2.5 = Low Utilization

NB: figures in parenthesis are percentages

### Relationship between level of knowledge and utilization of improved pig production technologies

The correlation estimate of the relationship between level of knowledge and utilization of improved pig production technologies by farmers in Abia State is presented in Table 5. The result showed there is a positive and significant relationship between level of knowledge and utilization ( $r = 0.483$ ;  $P < 0.05$ ). This implies that the more knowledgeable the pig farmers are about the improved technologies, the more likely they are to utilize the technologies to boost production. On

the other hand, the more they used the technologies, the more knowledgeable they become about them and this confirms the axiom “practice makes perfect”. The implication is that knowledge influences utilization. This result is consistent with Chaudhary *et al.*, (2013) who noted that farmers Knowledge was positively and significantly related to adoption of improved agricultural practices. According to Mariyappan *et al.*, (2017), possessing sufficient knowledge and utilization of improved technologies helps to make farming business more profitable.

**Table 5: Correlation analysis of knowledge and utilization of improved pig production technologies in Abia State**

Variables	r-value	P - value	Decision
Knowledge vs Utilization	0.483**	0.000	significant
Sample size	57		

Source: Field survey data, 2019

\*\* . Correlation is significant at the 0.01 level (2-tailed).

### Conclusion

The study analysed awareness, knowledge and utilization of improved pig production technologies among farmers in Abia State, Nigeria. The results show that majority of the pig farmers in the study area were

aware of improved pig production technologies, but their knowledge base was moderate which also lead to moderate utilization of the technologies. However, their awareness, knowledge and utilization of vaccination and deworming technologies were very high. It is

therefore recommended that these technologies be properly publicized by relevant agencies in order to enhance awareness. Appropriate information should be disseminated by extension using the right channel. Trainings should be organized regularly to provide opportunity for the farmers to seek clarification and have better understanding that will lead to increased and sustained utilization of these technologies.

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