



## Profitability Analysis of Pig Production in Ihiala Local Government Area, Anambra State, Nigeria

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### ABSTRACT

The study analyzed the profitability of piggery production in Ihiala Local Government Area of Anambra State. The specific objectives were to; ascertain the production system practiced by the farmers, determine costs and return of piggery production, determine the factors that affect piggery production and identify the constraints encountered by the farmers. Well-structured questionnaire was used to collect data from 30 respondents, who were purposively selected from six communities out of ten communities that made up Ihiala Local Government Area. Data collected were analyzed using descriptive statistics, Gross Margin and Multiple Regression. Results show that mean farm size was 54 pigs and average of 16pigs per production cycle. The average income generated was ₦2, 061, 300 and the average cost of production was ₦1, 382, 100. The net revenue was ₦679, 200. Return on investment was 0.49 kobo per Naira Invested. Farm size and household size were significant and positively related to output at 1% and 10% with the value of 0.853 and 0.531 respectively. The major constraints encountered by the respondents were; inadequate fund (93.33%), high cost of labour (80%) and non-availability of good breed (80%). Pig farmers in the study area should form cooperative society in order to address the problem of inadequate fund.

### INTRODUCTION

Livestock is one of the fastest growing agricultural sub- sectors in developing countries. Livestock products contribute 17 per cent to kilocalorie consumption and 33 per cent to protein consumption globally, but there is large discrepancy between rich and poor countries (Rosegrant, 2009). According to World Bank (2009), livestock systems is said to have both positive and negative effects on public health, social equity, natural resources and economic growth. This growth is attributed to the increasing demand for livestock products, as a result developing world tripled between 1980 and 2002, from 45 to 134 million of population growth, urbanization and increasing incomes in developing countries (Delgado, 2010).

Livestock production and products in industrialized countries account for 53 per cent of agricultural Gross Domestic Product (World Bank, 2009). According to Ezeibe (2014), pig industry in Nigeria is an important arm of livestock subsector in the overall agricultural sector due to high fecundity; high feed to meat conversion efficiency, early maturity, short gestation period, cooking fats and bristle. Pig production is widely scattered across the globe. The estimated global pig inventory of were nearly 1 billion head in 2011 with China having the over 50% of the population (FAO, 2011). Pigs are produced primarily in regions of the world with available natural resource including arable land, cereal grains and water (Hedegepath, 2008). With increasing human population in Nigeria and virtually static agriculture productivity, the animal protein consumption among Nigerians has worsened in the past few years (Okpor, 2007). Many Nigerians feed mainly on carbohydrate, as a result of the inability of an average man to afford the cost of animal protein which is richer



in amino acid. The deficiency of animal protein in the diet of so many people is often attributed to the low number of livestock (cattle, pigs, poultry, goats, sheep and their products), and the activities connected with their production which are insufficient.

According to Ugwu (2006), animal protein apart from its palatability is essential for normal physical and mental development of man, thus its deficiency in the diet exerts adverse effects in terms of reduced human productivity due to abnormal development. He also noted that animal protein deficiency causes high incidence of infant mortality, pronounced malnutrition and exposure to disease. Many Nigerians feed on carbohydrate diets which comprises of cereals or starchy food and tuber crops which have relatively low protein. Due to remoteness and inaccessibility, the rural area farmers had evolved a self-sustainable local resource based production system in which pigs are mainly dependent on local vegetable crop residues and kitchen waste (Moanaro *et al.*, 2011). Pigs thus serve as an avenue for additional income and employment that can improve the livelihood in a sustainable manner (Petrus, 2011). The livestock however, remain one of the fastest growing parts of the agricultural economy driven by income growth and supported by technological and structural advancement. The growth and transformation of the sector offers opportunity for agricultural development, reduction in poverty and food security gain. Pig production among others has high potential to contributing to high economic gain (FAO, 2006).

Pigs have some unique advantages over all other livestock animals which include its ability to multiply extensively, to combat protein deficiency, their fast growth rate attaining market size at 6-9 months, short gestation period of three months, three weeks and three days (114days), high prolificacy and high fecundity which surpasses any other animal species (Ezeibe, 2010). Pigs are very efficient in feed utilization, thus has high feed to meat conversion rate which brings better return to the farmer per unit of input than most other animals. The quality of their meat is tender and more nutritive in protein and B-vitamin than other animals. Pig production has not fully developed in Nigeria compared to ruminants and poultry production (Ogunniyi *et al.*, 2011). Agubiade (2011) reveals that the neglect or slow growth of the piggery industry can be attributed to acceptability and management problems. The tendency of some entrepreneurs leaving pig business can be attributed to the educational level of the operators, absence of good breeds, cost of feed, cost of production and access to research and extension services (Onumere, 2008). There is inadequate baseline information regarding pig production in the commercial nerve center of Anambra State and thus, the reason of this research is to bridge the gap in knowledge.

### **Problem Statement**

Pig production and its products have various economic advantages which range from pork serving as a good source of protein and a viable avenue of revenue to both the nation and the citizens. The hides are used for making leather bags, bristle used in making brushes etc. Despite this tremendous economic importance of piggery production, the business is constrained by disease outbreak, lack of finance, lack of good breeds, high cost of feed, lack



of access to credit facilities, unavailability of veterinary health care system, poor transportation and religious bias. Consequently there is need to analyze the productivity of piggery production. The following research questions guided the study: ascertain production systems of piggery production, ascertain the cost and returns of piggery production, determine the factors that affect piggery production and identify the constraints encountered by piggery farmers. A null hypothesis which states that there is no significant relationship between the socio-economic characteristics of piggery producers and their output was formulated.

### Study Area

This study was carried out in Ihiala Local Government Area of Anambra State. Ihiala is one of the twenty one local governments that made up Anambra State, with its headquarters located at Ihiala town. The local government occupies a land space of 304square kilometers. It has a population of 87,796 (National Population Census, 2006), making it the fifth biggest city in Anambra State. It is located at 48 kilometer north of Owerri and 40 kilometer South of Onitsha. It is bounded by Ogbaru (Ogbaru local government area) on the West, Ozubulu (Ekwusigo local government area, Ukpokwu and Orsumenyi (Nnewi South local government area) in the North and in the South by Egbuoma, Ohakpu, Ozara and Oguta in (Egbema/Oguta local government area) in Imo State. The local Government is made up of 10 communities and they are Ihiala, Amorka, Azia, Lilu, Okija, Iseke, Orsumoghu, Ubuluisiuzor, Mbosi and Uli. It has its rainy season between April and October and dry season from November to March. The people of this Local Government are known for their business and farming activities. They engage in food crops such as cocoyam, yam, and cash crop production such as palm trees, cocoa, oil bean and livestock such as goat, sheep, pig and poultry. They also engage in crafts and arts such as mat making, basket making, and pottery.

### Sampling Technique

Multi-stage sampling techniques was used for this study. Out of the ten communities that made up Ihiala Local Government, six communities Ihiala, Uli, Iseke, Okija Amorka and Ubuluisiuzor were selected. Five farmers were purposively selected from each of the six communities. A total of 30 respondents were used for the study. The data for this study was collected from primary source. A well-structured questionnaire was used for data collection. The data collected were on the socio-economic characteristics of the respondent, system of production, cost and returns, constraints encountered, factors affecting piggery production. Descriptive and inferential statistical were used in the analysis. Objective I, ii and v were analyzed using descriptive statistics. Objective iii was analyzed using gross margin analysis. Objective iv was analyzed using Multiple Regression. The model is stated thus;

$$Y = F (X_1, X_2, X_3, X_4, X_5, X_6, X_7, e)$$

Where Y = Value of Output

X<sub>1</sub> = Output (N), X<sub>2</sub> = Age of the Farmer (Years), X<sub>3</sub> = Marital Status of the Farmer (Single or Married), X<sub>4</sub> = Gender of the Farmer (Male or Female), X<sub>5</sub> =



Educational Level of the Farmer (Years spent in school),  $X_5$  = Household Size (No. of people in the family),  $X_6$  = Farm Size,  $X_7$  = Farming Experience and  $e$  = error term.

Gross Margin = Total Revenue (TR) – Total Variable Cost (TVC)

Net Profit = Total Revenue (TR) – Total Cost (TC)

Total Cost = Total Fixed Cost (TFC) + Total Variable Cost (TVC)

Total Revenue = Price (p) x Quantity (Q)

## RESULTS AND DISCUSSION

### Farm Size

The result on Table 1 shows that 26.67% of the farmers had farm size (number of pigs) within the range of 31 to 40. 23.33% of them had number of pigs ranging 61 to 70. 10% of the farmers had pigs within the range of 51 to 60. While (3.33%) had farm size within the range of 111 to 120, 11 to 20 and 41 to 50 respectively. The mean number of pigs kept by the farmers was 54 pigs. This shows that the farmers had large farms and they were expected to produce more pigs and make profit.

**Table 1:** Distribution of the Respondents according to Number of Pigs Reared

Range of No. of pigs	Frequency	Percentage
11 – 20	1	3.33
21 – 30	3	10.00
31 – 40	8	26.67
41 – 50	1	3.33
51 – 60	3	10.00
61 – 70	7	23.33
71 – 80	6	20.00
81 – 90	0	0.00
91 – 100	0	0.00
101 – 110	0	0.00
111 – 120	1	3.33
<b>TOTAL</b>	<b>30</b>	<b>100</b>

Mean Farm Size = 54pigs.

### Type of Enterprise

The result on Table 2 shows that majority of the farmers (57.89%) were into full production of pig. That means that they started from rearing to farrow, weaning and fattening to market size. Only 10% of them engaged in farrowing and weaning after which the piglets were sold off. This shows that any segments of pig production a farmer is into is termed highly profitable and thus will lead to high productivity.

**Table 2:** Distribution of the Respondents according to Type of Enterprise

Enterprise Type	Frequency	Percentage
Farrow to Weaning	3	10.00



Farrow to Finish	6	20.00
Combination of both	21	57.89
<b>TOTAL</b>	<b>30</b>	<b>100</b>

### Production System

The result on Table 3 shows that majority of pig farmers in the study area (80%) adopted intensive system of piggery production by confining their pigs in the house. 13.33% of the farmers adopted semi-intensive system whereby the pigs are partly housed and are partly allowed to scavenge for food. Very few of them (6.67) adopted extensive system of piggery production by allowing the pigs to roam about and scavenge for food. By majority of farmers adopting intensive system of production in the study area implies that the farmers have adopted modern system of production and had given off their traditional system (Extensive). The pigs are fed with formulated feeds and are well taken care of in order to maximize profit.

**Table 3:** Distribution of the Respondents according to Type of System of Production

Production System	Frequency	Percentage
Intensive	24	80.00
Semi-intensive	4	13.33
Extensive	2	6.67
<b>Total</b>	<b>30</b>	<b>100</b>

### Breeds of Pigs

The result on Table 4 shows that majority of the pig farmers (53.33%) in the study area engaged in the production of large white breed. Duroc (26.67%) received second position and patronage from the farmers. While few of them (20%), engaged in the production of land race. Therefore, large white was more popular among the farmers in the study area

**Table 4:** Distribution of Respondents according to Breed of Pigs Reared

Breed Reared	Frequency	Percentage
Large White	16	53.33
Duroc	8	26.67
Land Race	6	20.00
<b>TOTAL</b>	<b>30</b>	<b>100</b>

### Litter per Cycle

The result on Table 5 shows that majority of the farmers (50%) had litter size within the range of 11 to 15. 33.33% of the farmers had litter size ranging from 16 to 20. Only (3.33%) of the farmers had litters within the range of 6 to 10, while (3.33%) had litter up to the range of 31 to 35 per production cycle. However, the mean litter size per cycle was 16 piglets indicating large litter per cycle. The implication is that they were likely to make good returns in each production cycle.

**Table 5** Distribution of the Respondents according to Number of Litters Obtained per Production Cycle

Litter size	Frequency	Percentage
6 – 10	1	3.33



11 – 15	15	50.00
16 – 20	10	33.33
21 – 25	2	6.67
26 – 30	1	3.33
31 – 35	1	3.33
<b>TOTAL</b>	<b>30</b>	<b>100</b>

Mean litter size per cycle = 16pigs

### Cost and Return of Pig Production per Cycle

The result on Table 6 shows that average revenue of the pig farmers was ₦2,061,300 while the average cost of production was ₦1,356,700. This gave a net return of ₦679,200 indicating that pig production was profitable in the study area. It was also economically viable because the return on investment (ROI) conducted indicates that for every ₦1.00 invested by an average pig farmer, 0.49k was realized.

**Table 6:** Average Cost and Return of Pig Farmer per Production of Cycle

A. TOTAL REVENUE	₦ 2,061,300
B. <u>VARIABLE COST</u>	
Hired Labour	412,000
Own/family Labour	179,000
Stock	195,000
Feed	291,333.33
Transportation	78,000
Medication	20,200
Water Supply	143,000
Miscellaneous Expenses	37,666.67
Total	1,356,700
C. <u>FIXED COST</u>	
Depreciation provision	25,400
Total	25,400
D. <u>Total Cost (B + C)</u>	1,382,100
E. <u>Gross Margin</u>	
(A – B)	704,600
F. <u>Net Revenue</u>	
(A-D)	679,200
<u>Return on Investment</u>	
(E/D)	0.491

### Determination of the Factors that Affect Piggery Production

The result on Table 7 contains a multiple regression model estimated in four functional forms. The model relates the output of pig farmers to their socio-economic characteristics. Following econometric and statistical reasons, the linear form was chosen as lead equation. It provided the best fit because it has the highest value of co-efficient of multiple determinations ( $R^2$ ) 0.989. This shows that up to 99% variations in the output of the pig farmers were jointly explained by set of explanatory variables of the model. The rest of 1%



was taken care of by variables not included in the model. It has also the highest number of statistically significant variables. Farm size represented (number of stock) was statistically significant at 1%, while house hold size was statistically significant at 10% level of probability. Being significant indicates that they influenced changes in the output tremendously. Age, marital status, educational qualification and level of experience coefficient were negatively related to output. Farm size and house hold size coefficient were positively significant indicating that any increase in them, increases output of farmers. The F-ratio was highly significant indicating the overall significance of the model. The hypothesis that says that there was no significant relationship between the socio-economic characteristics of pig farmers and their output was rejected and concluded that there is a significant relationship.

Table 7: Estimation of the factors that affect piggery production.

Variable	Linear	Exponential	Semi log	Double log
Constant	3.723 (0.959)	-7.637E+42 (-1.072)	2.797 (16.877)***	19.388 (2.220)**
Age (X <sub>1</sub> )	-0.056 (-0.955)	1.345E41 (1.241)	-0.011 (-0.525)	-1.182 (-0.545)
Sex (X <sub>2</sub> )	1.335 (0.730)	-1.490E45 (-0.438)	0.187 (2.360)**	-14.073 (-4.289)***
Marital Status (X <sub>3</sub> )	-0.151 (-0.110)	-1.383E42 (-0.550)	0.019 (0.317)	2.195 (0.963)
Educational Qual. (X <sub>4</sub> )	-0.100 (-0.664)	6.297E40 (0.229)	-0.008 (-1.309)	1.450 (1.488)
Farming Exp. (X <sub>5</sub> )	-0.131 (-0.801)	3.292E41 (1.095)	-0.003 (-0.485)	-0.133 (-0.138)
Farm Size (X <sub>6</sub> )	0.853 (34.09)***	1.007E41 (2.194)**	0.017 (16.383)***	-0.646 (-0.728)
House Hold Size (X <sub>7</sub> )	0.531 (1.810)*	-8.700 (-1.616)	0.012 (0.941)	0.975 (0.992)
R <sup>2</sup>	0.989	0.392	0.958	0.758
$\bar{R}^2$	0.986	0.199	0.945	0.443
F-Ratio	283.014***	2.027*	72.132***	4.296**

\*Significant at 1%

\*\*\* Significant at 10%

### Constraints Encountered by Pig Farmers

The result on Table 8 shows that among the perceived constraints of pig farmers in the study area, inadequate fund took the premier position (93.33%). The farmers was of the view that insufficient fund limited their production. Second to this problem was high cost of labour (80%) and non-availability of good breeds of pigs (80%) respectively. High cost of feed and inadequate land had 66.67 and 66.67 percent respectively. Religious belief has less percentage of (13.33) among others. This indicated that, the farmers had a lot of constraints which reduced their productivity in the study area.



**Table 8:** Distribution according to constraints.

constraints	Frequency	Percentage
Inadequate Fund	28	93.33
High Cost of Feed	20	66.67
High Cost of Labour	24	80.00
Non Availability of Vet. Doctor	18	60.00
Non Availability of Good Breed	24	80.00
Inadequate Extension Services	14	46.67
Religious Belief	4	13.33
Inadequate Land	20	66.67

\* multiple response

## CONCLUSION

Majority of the farmers had 31-40 (26.67%) pigs, followed by 61-70(23.33%). The type of enterprise were farrow to finish with only 10% in farrow to weaning. Intensive system was the major practice in the area. The breeds of pig reared were mostly large white and duroc. Most of the farmers recorded large litter size of 11-15(50.0%) and 16-20 (33.33). Farm size and household size were positively significant at 1% and 10% respectively which indicated that increase in them will increase the output of the respondents. The main constraints to pig production were inadequate fund, non-availability of good breed and high cost of labour.

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