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Economic Analysis of Broiler Production (A Case Study of Orumba South L.G.A of Anambra State, Nigeria)

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Abstract: This studied the profitability of Broiler production in Orumba South local government area of Anambra State, Nigeria. Respondents were drawn from various villages that made up Orumba South L.G.A of Anambra State. The respondents were small-scale, medium scale and large-scale broiler producers. Forty three (43) producers were selected through a system of random sampling. Data collected were on socio-economic characteristics, costs and returns and problems associated with fish producing in the study area. Structured questionnaires were the instrument used for data collection. Analytical tools used were percentages, gross margin and regression model. Percentages were used to describe the socio-economic variables and problems associated with fish production. While gross margin model and multiple regression model were used to determine the profitability and economic analysis of broiler production. The result revealed that more than half of the broiler producers were women with small- scale, medium-scale and large-scale in the proportion of 27.91%, 25.58% and 23.26% percent mostly in their middle ages of 41-50 years. Major problems faced were that of lack of capital, inadequate feed supply, drugs, diseases, poor transportation network, medications and labour seriously affected productivity. The study recommends feed subsidies by the government, provision of adequate incentives and supporting services to broiler producers and releasing of loans to farmers irrespective of their scale as well as organizing training workshops to increase awareness in profitability of broiler production. All these would help develop the industry, thus boosting productivity in production.

Key words: Broiler production · Orumba South · Anambra State · Economic Analysis and Analytical tools

INTRODUCTION

Background Information: In Anambra state of Nigeria, the protein sources are mainly sheep, goat and poultry. However, other sources of protein are plants especially (legumes) and animal from the wild. Animals from the wild are not easily accessible to the populace, although a few domestic animals like rabbit, sheep, birds etc. are kept. But these cannot meet up the protein requirements of the body. Inadequate protein intake by most Nigerian is a recognized problem.

The average Nigerian diet contains about 7gm/ caput/ day of animal protein as against the recommended intake of 28gm/caput/day for normal health [1]. What is known as poultry farming in Nigeria developed slowly. But steadily from the 1950's until, when as a result of introduction of structural adjustment programme (ASP), it began to experience the crisis which persisted until today [2]. The importance of animal protein apart from its palatability is undisputed, animal protein provides man with high quality food nutrients for growth and tissue replacement. It determines the level of nutrition of the population and the health of the work forces, which in turn determines the development of a nation and its economy. Although formally. The Nigerian government in an attempt to alleviate this problem has always resorted to mass importation o f meet. The Obasanjo led administration has put more effort towards

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self-sustainability in poultry production by placing ban on the importation of frozen chicken. The problem which solution is sought is that of harmonizing or balancing the shortage in supply caused by the ban on importation of frozen chicken. This can only be achieved by increasing poultry production. Also, many Nigerian livestock farmers in their own effort have preferred to invest in the poultry industry making it easy for the transformation of the previous back yard and less efficient system of poultry keeping to a more scientific system, despite their poor capital base.

The potential of poultry industry in reversing the inadequate protein intake by most Nigerians has also been recognized.

In comparison to other livestock enterprises, broiler production have the advantage of the fast growth rate, cheaper, high feed conversion efficiency, can be eaten by one family man and is not forbidden by any culture or religion. The Nigerian Agricultural Economy enjoyed decade of boom in poultry production between mid 70's and mid 80's. For instance the population of cattle (174.32 million), goat (156.6 million) and sheep (190.31 million) while that of poultry was estimated to be 660 million against other animal population in 1983. The production level was so high that the sub-sectorial economy becomes second in African [3] with proper attention, poultry can be relied upon in a short run solving the deficit in protein supply.

Several suggestions have been offered as a short term measures to combat meat shortages in Nigeria. [4] has suggested emphasis on massive poultry production, but the limitations posed by shortages and high cost of food grains and medication were obvious. Even the call for increasing awareness of Nigerians about the serious consequences of animal protein shortages, the encouragement of every Nigerian to keep a few livestock as a hobby by as well as liberalization of credit facilities and subsidies on factors of production for genuine livestock farmers to increase production and reduce price has not significantly solved the problem. The Nigerian government is trying to design policies that would encourage increased livestock production and marketing at both the public and private sectors. Recently, the Anambra State government in view of the problem, embarked on distribution of cockerels to civil servants at an agreed ratio of 1.1 in other to enhance livestock production. But the fact that population growth of 3.3 percent relatively faster than the 2 percent growth rate in livestock production indicates that the situation is going to worsen in the future unless there is a drastic reorientation in the livestock industry [5]. It is this quest for solution to these problems that this work is embarked upon using Orumba south LGA as a case study.

Statement of the Problem: The importance of poultry production for protein cannot be over-emphasized. Healthy labour force is as a result of adequate protein intake. In a recent survey of the nutrient content of rabbit meat to other farm animals by [6], it was discovered that broilers (chicken) has the highest protein content of 21-50 percent to rabbit and beef, which contain 20-22 percent and 18 percent protein respectively.

As indicated at the background information of this chapter broiler production has suffered many set back.

According to the world health organization standard [7], Nigeria like most other developing countries is faced with inadequate supply of animal protein. Agricultural policy in Nigeria has emphasized increase agricultural production through a range of policies and strategies to obtain self sufficiency in food production without achieving these aims (federal government of Nigeria).

Over the years, Nigeria government and individuals have tried to design policies that will encourage increased broiler production. These were due to the profitability of the business.

The aim to meet the growing need of protein (balanced) diet) for a healthy work force and demand for a thinning population to be self sufficient. Today, the decline in the growth of poultry industry has continued unabated. It is against this background that this study was undertaken to ascertain whether or not the profitability and the productivity level of this industry is enough to raise the income and the protein intake of the people of Orumba South L.G.A of Anambra State, Nigeria. Objective of the Study: The broad objective of this study was to determine the economics of broiler production in Orumba South LGA of Anambra State, Nigeria.

The Specific Objectives Were To:

- Examine the socio economic characteristics of broiler producers in Orumba South L.G.A of Anambra State, Nigeria. Examine the socio economic determinants of broiler output in the study area:
- Analyze the resource use efficiency in broiler production.
- Determine the cost and returns associated with broiler production.
- Examine the problem associated with broiler production.

- Make recommendation based on the findings this research.

Hypothesis:

- Broiler farmers in Orumba south do not optimize their production resources.
- Socio economic characteristics: name, age of the farmer; education in number of years spent in school; experience in years, do not significantly influence the output on broiler production in Orumba South LGA

Significance of Study: This study aims at improving the level of protein intake in the study area by making recommendations that will help to counter the effects of problem encountered in broiler production. There were observations that there was poor private sector investment in agricultural production.

It was also aimed at encouraging private sector investment by revealing the returns or profitability accruable from broiler production. It is expected that at the end of this research. Solution to the existing problems militating against the growth and development of the poultry be proffered as feedback to the poultry farmers in Orumba South L.G.A. of Anambra State, Nigeria.

Limitation of Study: All the poultry enterprises in Orumba South Local Government Area should have been studied but for the high cost of transportation during the period of data collection and the fear (by entrepreneurs) that the financial information to be collected will expose them to the problem of higher levies/fees and taxes. Again, the study is restricted to the performance in the broiler industry over a period of time say 2-3 cycles was considered. The result should have been somewhat different. This therefore opens up another area for investigation.

Study Area and Research Methodology

The Study Area: This study was conducted in Orumba South Local Government Area of Anambra State, Nigeria. Orumba South Local Government Area is made up of 9 major towns with 31 autonomous communities; Owerre Ezukala, Ogbunka, Umuchukwu, Umunze Nofija Isulo, Ezira, Eziagu, Ihele. They are alike in all areas both in economic potentials and social system.

Orumba South is located 24-25°S and 32-35$_0$N in the rain forest zone of South Eastern Agricultural zone of Nigeria, from the record of the 2005 census. Orumba South has a population of over 100,000 people. It is bounded by Orumba North Local Government Area in the North, Isochi Local government area of Abia State in the East, Agwuata Local Government Area in the West, it is about 14km^2 south east of Arondizuogu of Imo State.

The rainfall pattern and temperature vary seasonally. In the dry season, the mean temperature is as high as 35°C and in the rainy periods it can go as low as 25-28°C.

Rainfall reaches an average of 2,000 per annum. This depicts high precipitation. This mean annual soil temperature is about 28.8% and relative humidity ranges from 66-79%. The main occupation of the people is farming.

Their cropping system is mainly mixed cropping, inter cropping

A greater area of the soil is fertile. Agricultural products like cassava, maize, coco yam, palm wine, palm oil etc are produced here. Most people here also engage in livestock production, such as sheep, goat, pig and poultry production. Also most people here are civil servants.

The vegetation is tropical which is characterized by thick forest and high fly infestation disfavours ruminant livestock production, but favours non-ruminant livestock farming.

Sampling Technique: The sample frame for this research was all the 43 know broiler farms in Orumba South Local Government Area of Anambra State. The local government area is made up of 9 communities which are Owere, Ezuka, Umunze, Umuchukwu, Ogbunka, Nofija, Isulo, Eziagu and Ihete.

The random selection was to avoid bias. This formed the sampling size of this research.

Method of Data Collection: The researcher collected both primary and secondary data for this research.

Primary data came through the use of structured questionnaires and personal observation by the researcher. In collecting such data, the researcher asked the larger and smaller farm holders relevant questions pertaining to poultry production. This includes information obtained from inventories such as receipts, farm records, ledgers, production charts, types and sources of input and production cost as well as returns.

The secondary data for this survey were gathered from existing findings in form of Books, Journals Newspapers, Magazines, Bulletins, Project work etc. through literature review.

Data Analysis Techniques: The data collected were analyzed using descriptive statistical and econometric tools. Objectives (i) and (v) was analyzed by the use of tables. Percentage and means. Objectives (ii) was analyzed by regression analysis; the implicit functional form is specified as follows:

$Q = f(x_1, x_2, x_3, x_4 x_5, x_6 x_7)$

where,
Q = Total Output (Naira)
k_1 = Labor (man days)
k_2 = Feed (Naira)
k_3 = Other Inputs (Naira)
k_4 = Capita (Naira)
k_5 = Age in (years) of the farmer
k_6 = Education in number of years spend in school
k_7 = Experience in years.

Objective (iii) was realized by regression marginal analysis.

The implicit form of the model is specified as follows:

$$Q = f(x_1, x_2, x_3, x_4) \quad (1)$$

where,
Q = Total Output (Naira)
k_1 = Labor (man days)
k_2 = Feed (Naira)
k_3 = Other Inputs (Naira)
k_4 = Capita (Naira)
U = Error term

Four functional forms which include exponential function, semi-log function, double log function and linear function were tried. On the basis of statistiscal and econometric reasons. The estimated equation with the best fit was chosen as the lead equation.

Price efficiency was determined by equating the marginal value product (MVP x_1) of the input to its unit.

$$P_{x1} = mvp_{x1} = P_y f_i = P_{xi} \quad (2)$$

where,

Mvp_{XI} = Marginal value product of the ninth input
p_{XI} = Unit input price
$f_i = dq$ = marginal product (mp) of
dx = ninth input
P_y = unit output price

From equation (2) an index of price efficiency k_1 is derived as:

$$\frac{MVP_{xi}}{P_{xi}} = \frac{P_y f_i}{P_{xi}} = K_i \quad (3)$$

where all other terms are as previously defined maximum profit is realized when absolute price efficiently is confirmed ($K_i = 1$) if $K_i > 1$, less than the profit maximizing level of that input has been used which implies that the input is underutilized. In this study, the output is measured is monetary terms. Therefore, P_y becomes irrelevant and equations (2) and (3) respectively becomes:

$$MVP_{xi} = f_i P_{xi} \quad (4)$$

$$\frac{MVP_{xi}}{P_{xi}} = \frac{f_i}{P_{xi}} = K_i \quad (5)$$

For the inputs that are measured in monetary terms, P_{xi} becomes irrelevant and equation (5) becomes:

$$MVP_{xi} = f_i = K_i \quad (6)$$

To measure the extent to which any input should be increased or withdrawn from current level of use, evaluate the equation:

$$(1 - k_i)\ 100 = 0 \quad (7)$$

where 0 is the required percentage in price efficiency, if equation (7) is evaluated, a negative percentage implies that an increased employment of the input is required to increase the profit level. A positive percentage would imply that a reduction in the level of input use is required. If 0 is zero. Then maximum profit would have been realized and price efficiency is at optimum [8].

Objective of this study was realized by net farm income analysis. This analysis was carried out to find out if broiler production is profitable or not.

Profit = TR – TC
$\Sigma P_1 Q_1$ = ΣiFC + VC
I = 1

where,
TC = Total cost (fixed cost & variable cost)
TR = Total Revenue
Pi = Unit price of output
Q = Quantity of output
FC = Fixed Cost
VC = Variable Cost
n = number of inputs used in production.

RESULTS AND DISCUSSION

Respondents whose ages ranged from 41 to 50 years dominated the farming population (27.91%), following by those of 31-40 years age bracket (25.58%). However, farmers from 61 years of age and above ranked least (4.65%). The profitability of the enterprise can be attributed to the fact that majority are able-bodied farmers.

Greater proportion (62.79%) of the farmers was female. This attributable to the less intensive Labour demand of poultry farming which the female gender could afford. More so, females are fund to be more caring as is required by poultry rearing then males.

51.16% of the farmers had secondary education, followed by 27.91% who had tertiary education. Only 4.65% of the respondents had no formal education. The high level of educated farmers here could be due to the special skill required in the enterprise.

Greater percentage (60-47%) of the respondents was married. While, the rest of the farmers were single. This can be attributed to the fact most married men are seen as being responsible and stand in advantage of obtaining loan/credit from financial institution, coupled with the availability of more hands from their children which increase the labour needed in the enterprise, thereby aiding increased productivity.

Majority (41.86%) of the farmers has less than five years of farming experience. 34.88% had farming experience that ranged between 5-9 years. Only 2.33% had 19 years of experience. This can be attributed to increase number of new entrance into the enterprise which in turns made them to embark on small-scale production since they had little experience to handle large scale production indicated in table 4.7 below, where majority of the farmers rear less than 500 birds.

Greater percentage (39.53%) had farming as a major occupation. 34.88%, civil service while trading ranked least (25.58%) this can be attributed to large expansion of land available for farming in the area, while that of civil servants can be related to the educational level in table 4.3, where the greater percentage have formal education.

Majority of the farmer (86.05%) reared less than 500 birds. While only 9.3% and 4.65% kept between 500 – 1000 and greater 100 birds but less than 5000 birds respectively. The dominant small-scale of most farms is attributed to the high cost required to operate large scale and inadequate capital faced by the high cost required to operate large scal3e and inadequate capital faced by farmers.

Table 1: Distribution of respondents according to Age of the Farmer

Age range	Frequency	Percentage (%)
21 – 30	10	23.26
31 – 40	11	25.58
41 – 50	12	27.91
51 – 60	8	18.60
61 and above	2	4.65
Total	43	4.65

Source: Field survey 2010.

Table 2: Distribution of respondents according to sex

Sex	Frequency	Percentage (%)
Male	16	37.21
Female	27	62.79
Total	43	100

Source: Field survey 2010

Table 3: Distribution of respondents according to Education level

Education level	Frequency	Percentage (%)
No formal Education	2	4.65
Primary Education	7	16.28
Secondary Education	22	51.16
Tertiary Education	12	27.91
Total	43	100

Source: Field survey 2010

Table 4: Distribution of respondents according to marital status

Marital status	Frequency	Percentage (%)
Married	26	60.47
Single	17	39.53
Total	43	100

Source: field survey 2010

Table 5: Distribution of Respondent According to Years of Experience

Years of Experiences	Frequency	Percentage (%)
<4	18	41.86
5-9	15	34.88
10-14	3	6.98
15-19	6	13.95
20 and above	1	2.33
Total	43	100

Source: Field survey 2010

Table 6: Distribution of Respondents according to Major Occupation

Marital status	Frequency	Percentage (%)
Trading	11	25.58
Farming (crop)	17	39.53
Civil Service	15	34.88
Total	43	100

Source: Field survey 2010

Table 7: Distribution of Respondent according to number of birds.

Number of Birds	Frequency	Percentage (%)
Less than 500	37	86.05
Greater than 500		
And less than 1000	4	9.30
Total	43	100

Source: Field survey 2010

95.33% practised Deep Litter system of management while 4.65% engaged in battery cage of which is mainly imported from developed countries, while as deep litter system can be practiced under uncompleted building and wooden houses using wood shavings which is readily available and cheaper.

Of all the problem encountered by the respondents inadequate capital (37.21%) ranked highest followed by incidence of mortality (20.93%) then transportation problem, inadequate feed supply, market channel and storage problem posed same degree of limitation (6.98) and ranked lowest.

The linear functional form is chosen as the lead equation because for exitmated coefficients are statically significant at 5 percent. Also its R^2 value of 0.999 is highest compared to those other functional forms.

Labour, feed, capital and other inputs were found to be significant determinants of the level of input. Cost of labour and feed has negative relationship with output this implies that as they increase output reduces capital and other inputs have positive relationship with output. Implying that they increase as output increase. The R^2 which is 99 percent indicates that 99 percent of the variation in output of broiler is explained by the variation in Labour. Feed. Other inputs. Capital, age. Educational level and experience in poultry production.

Since the Output Q Is Measured Monetarily: The marginal product is in monetary terms and is directly the marginal value product using equations (5) and (6). The price efficiency indices were derived. The result indicates that none of the inputs was optimally allocated. Capital and other inputs were under utilized, but this can be improved by increasing their utility by 733 and 5950 percent respectively. Labour and feed were over utilized, but this can be reduced by 88 and 96 percent respectively in order to achieve maximum profit.

Summary, Conclusion and Recommendation: The study delved into the economics of broiler production in Orumba South Local government Area of Anambra State specifically. It investigated the cost; returns and profitability of broiler production in the area, identified the problems militating against broiler production and made appropriate recommendations for improvement based on findings.

The results of Net farm income analysis showed high returns for the period of study. Input factors such as labour, feed, capital and other input were evinced as significant determinants of the level of output.

Table 8: Distribution of respondents according to management system

Management System	Frequency	Percentage (%)
Battery Cage	2	4.65
Deep Litter		
Battery case and	41	95.33
Total	43	100

Source: Field survey 2010.

Table 9: Distribution of respondents according to production problems.

Production Problems	Frequency	Percentage (%)
Inadequate Capital	16	37.21
Inadequate Feed Supply	3	6.98
Transportation problem	5	11.63
Mortality Problem	9	20.93
Veterinary problem	4	9.30
Market Channel	3	6.98
Storage	3	6.98
Total	43	100

Source: Field survey 2010

Table 10: Socio-economic Determinants of Broiler Production in Orumba South Local Government of Anambra State, Nigeria

Variable	Linear	Double-log	Exponential	Semi-log
Constant	193982.40	-0.661	10.515*	-2.8E+07
	(215749.58)	(2.619)	1.046	(15084548)
Labour	-25.708*	0.182	1.295E-05	560282.24
	(7.401)	(0.432)	(0.000)	2(288685.2)
Feed	-51.599*	0.208	3.939E – 06***	853199.49
	(0.437)	(0.330)	(0.000)	(1901124.6)
Other Input	63.326*	8.538E-02	-3884E*-*65	2207418.7
	(3.829)	(0.136)	(0.000)	(782943.36)
Capital	9.216*	0.992*	9.941E-06*	-617860.5
	(0.736)	(0.191)	(0.000)	(1099992.9)
Age	159.308	1.320	1.514E-03	5102358.4
	(3920.944)	(1.335)	(0.019)	(7688123.4)
Education	-9344.580)	-1.267	-2.039E-02	5279325.3*
	(9188.941)	(0.849)	(0.045)	(4890311.2)
Experience	-11154.91	-0.698	9.529E-03	-192701.6
	(7879.248)	(0.560)	(0.038)	(3228101.1)
R^2	0.998	0.864	0.736	0.491
R^2	0.998	0.836	0.683	0.386
F-ratio	3936.543	30.883	13.921	4.680

Source: Field survey. 2010.

Note * = significant at 1%

** = significant at 5%

** = significant at 10%

Values in parenthesis are standard error.

However, management efficiency, inadequate transport facilities, inadequate capital and feed greatly militated against production while the incidence of mortality, inadequate storage facilities, inadequate veterinary service, poor marketing channels and extension services and activities of middlemen posed lesser constraint to production.

Table 11: Estimated Production Function for Broiler Production

Variable	Linear	Double-log	Exponential	Semi-log
Constant	16374.701	0.567	10.416*	160407*
	(36631.993)	(0.886)	(0.171)	(4938438.6)
Labour	-23.034*	0.210	9.049E-06	-246802.0
	(7.046)	(0.404)	(0.000)	(2248712.0)
Feed	-1.690*	0.217	3.800E - 06***	1062407.5
	(0.429)	(0.320)	(0.000)	(1784621.1)
Other Inputs	64.130*	(8.376E-0)	-3.790E - 05**	2187901.1*
	(3.746)	(0.128)	(0.000)	(712934.96)
Capital	8.833*	0.873*	1.041E-06*	-326466.5
	(0.700)	(0.170)	(0.000)	(949474.94)
R^2	0.999	0.848	0.731	0.466
R^2	0.998	0.832	0.703	0.410
F-ratio	6825.112	52.853	25.862	8.290

Table 12: Resource efficiency indices

Variable	(P_X)	MVP	PEI(E) = MVP/(P_x)	(I-E)X 100h
Labour	200	23.034	-0.12	88
Feed N	42	-1.690	-0.04	96
Other inputs (N)	1.06	8.833	8.33	-733

Source: Field Survey. 2010

Table 13: Net Farm Income For Broiler

a. cost items	Value (₦)
Depreciation of assets	47012
Feed	187417
Labour	16513
Day old chicks	3608
Other inputs	15328
Total Cost (TC)	269878
Income from broiler	942048

Source: Field Survey. 2010.

Profit = total revenue – total cost = 942048 =N 672170

The net profit margin of N672170 reveals that the enterprise is profitable.

Furthermore, imposition of neck-break fees on poultry enterprises by Government, agencies, such as Local Government, sanitation authorities, health inspectors, posed a threat to new investors and adversely affected profits.

Policy Recommendation: Vis-à-vis the findings of this study, the researcher in a bid to enable bridging the gap created by the short-falls in the poultry production, proffered several recommendations.

- Government Policy should tackle the issue of lack of finance by assisting and encouraging farmers to form cooperatives; this would enclose resource- poor farmers secure loans as well as pool resources together to overcome the inadequacy of capital. Furthermore, as finance is one of the greatest impediments to the success of any plan of action in this section, Government need to make available directly or indirectly low cost funds for its development.
- The Government should also check the arbitrary/indiscriminate fees levied by its agencies to restore sanity and create room for investment and expansion.
- The Local Government should ensure that veterinary clinics that are well equipped with drugs are made available at strategic location in Orumba South Local Government Area, also the importation of high quality veterinary drugs and vaccines should be encouraged and with low tariffs.
- A well-coordinated extension programme, aimed at informing poultry farmers on the best-input combinations and management practices should be put in place. This would enhance productivity and profitability as well as processing and distribution.

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