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RISKS ANALYSIS ON RETURNS OF BROILER FARMING IN UGHELLI NORTH LOCAL GOVERNMENT AREA, DELTA STATE, NIGERIA

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ABSTRACT

This study analyzed the risks factors affecting the profitability of broiler farming in Ughelli North Local Government area of Delta State Nigeria. Two stage sampling technique was used to obtain 96 respondents through structured questionnaire and interview schedules and analyzed through the use of descriptive statistics and regression analysis and budgetary analysis. The broiler farms in this study were dominated by literate farmers (38%). Male farmers (63%) with age bracket of 41-50 years (57%). About 51% of the respondents were married. It was revealed in the study that the average total production cost of broiler in the study area was ₦397,980 while the average total revenue was ₦748,250. This resulted in a net profit of ₦350,270 in broiler production and ₦0.88k for average net return on investment (NROI). The study revealed that about 71% of the total variation in the value of broilers produced is accounted for by litter change, biosecurity infrastructure ($p<0.05$), vaccination schedule, stocking density and net farm income ($p<0.05$) probability levels respectively. It is recommend that government should empower the farmers with credit to meet the farm requirements to avert risk occurrence in the study area.

Keywords: returns, risks, broiler, farmer, production.

INTRODUCTION

Broiler is a type of chicken domesticated specifically for meat production. Amos (2006) described broiler production as an act of keeping chickens of heavy meat breeds for the purpose of getting good quality meat products usually sold live or processed when they are about ten to twelve weeks of age. Broiler production is the most prevalent poultry production enterprise in Nigeria and for the rapidly increasing population, intensive production of broiler meat is seen as a means of rapidly increasing animal protein (Marumo et al, 2016). This is in consonance with a report by FAO (2010) indicating that broiler production in the world has developed than any other meat production. According to Skip and Anne (2002) modern commercial broilers are mostly grown in large scale, efficient meat producers and develops faster than egg or dual purpose breeds. Broiler chickens has not only become a significant dietary component and source of high protein but also an important source of vitamins especially vitamin A, niacin, riboflavin and thiamine. Its production is undergone in all parts of the country with little or no social, cultural or religious interference associated with its consumption (Chukwuji et al 2006).

According to Ike (2011) poultry renders the highest scope of increasing the quality and quantity of animal protein in Nigeria as broiler meat and eggs accounts for about 30% of the total livestock output. This tremendous increase in the broiler meat and egg production can be

explained by the fact that poultry is more advantageous when compared to other livestock in the sense that poultry birds are efficient converters of feed into usable protein in meats and eggs. Broiler meat is tender, the cost of production is relatively low. Also the production cycle is to some extent short such that capital is not tied up for a long period of time and egg which is one of the important products of poultry production is more affordable to the common person than other sources of animal protein (Ojo, 2003 and Aboki, 2013).

A successful investment usually proves to have been based on an accurate prediction of the cost involved and the returns to be gained. It is the primary motivating force that drives investment. From the perspective of Mandura and Fox (2007) Return is the most fundamental measure in a venture and therefore worth spending time considering its various forms. Chandra (2008) views return as a reward for undertaking investment. It can also be applied to evaluation of a branch of an enterprise. Economist and financial theories assume that before making an investment decision a rational investor would consider a number of factors, one of such factors is the expected return on investment. Grimsley (2013) stated that return on investment is the ratio of a profit or loss made in fiscal year expressed in terms of percentage. It indicates whether or not a company or business is using its resources in an efficient manner. Nwajiuba and Nwoke (2000) in their research concluded that investment in broiler enterprise is encouraging and that more producers invests in the business because it is glaring that more economic profits are made. Return and risk are intertwined because investment decisions invariably involve a tradeoff between return and risk according to Chandra (2008).

Broiler enterprise is affected by many uncontrollable events that are often related to hazards of nature which include climatic changes in rainfall, relative humidity, temperature, predators and the problem of attacks by pest and disease. Risk which investment economist describe as the variations in returns in input – output relation among agribusiness venture (Kuyiran et al, 2001). An analysis on risk and returns with respect to broiler production is yet to be carried out. This study is therefore intended to bridge this gap.

The objectives were to describe the socioeconomic characteristics of broiler farmers, analyze profitability in broiler farming and determine the risk factors affecting broiler profitability.

MATERIALS AND METHODS

Study Area

This study was conducted in Ughelli north local government area of Delta State, Nigeria. Ughelli north is located between latitude 9°45'N and longitude 8°43'E. Annual rainfall is between 2500mm and 2800mm. The area was chosen for the study due to the fact that broiler production and associated risk factors are prevalent. Hence, broiler production risks need serious attention to encourage maximum investment among the broiler farmers. Farming is the predominant occupation of the people.

Sampling Technique/ Data Collection

A two stage sampling technique was used to select 96 broiler farmers in the study area. The first stage involved purposive selection of broiler farms from all the clans and the second stage involved a simple random sampling technique of 96 broiler farmers which were selected from the list obtained from the ministry of agriculture and natural resources Delta State. The survey was conducted using a pretested structured questionnaire.

Data Analysis

Data collected for this study was analyzed through the use of descriptive statistics, enterprise budgeting and inferential statistics.

Model Specification

Gross margin analysis was used for the measurement of Return. This measures the

difference between the total revenue and the variable cost of each enterprise in the farming system. The mathematical model of GM analysis was expressed as shown:

GM= TR–
TVC……..…… (1)

Where:

GM = Gross Margin (Naira),

TR = Total Revenue (Naira),

TVC = Total Variable Costs (Naira).

Net Farm Income (NFI) was computed as:

NFI= TR -
TC……..… (2)

Where: NI = Net Income (Naira),

TR = Total Revenue (Naira),

TC = Total Cost (total variable cost + total fixed cost)

TR =
Py,…….(3)

Py= Price of the matured bird,

y = Total number of broilers sold

$TC = r_1x_1 + r_2x_2 +$
b……..(4)

r_1r_2 = prices of inputs (measured in Naira)

x1….xn = variable inputs (labour, feeds, drugs, electricity and operational costs measured in Naira)

b = cost of any fixed input (measured in Naira)

Regression analysis on Determinants of Risk on Profitability

The implicit form of the multiple regression models takes the form:

$Y = f(X_1, X_2, X_3,……..Xn) + \mu……(1)$

The explicit form of the linear function takes the form:

$Y = \beta o + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \beta_7X_7 + \beta_7X_7 + \mu……..(2)$

Where:

Y = Observed risk (%)

X_1 = Frequency of litter change (number)

X_2 = occurrence of risk on breed of bird stocked (dummy yes=1, otherwise = 0)

X_3 = Biosecurity infrastructures available (number)

X_4 = Adherence to recommended vaccine schedule (rank of 1-5 points)

X_5 = Feeding regime (number)

X_6 = Climate (Dummy climate impact =1, otherwise = 0)

X_7 = Stocking density (number of birds)

X_8= Net farm income (profit ₦)

βo = Constant

β_1-β_8= Regression co-efficient of respective variables.

RESULTS AND DISCUSSION

Socioeconomic Characteristics of the Broiler Farmers

The result of the socioeconomic characteristics of the broiler farmers are presented in the Table 1.

Age: The result of the study shows that majority of the broiler Farmers are within the age bracket of 41-50 years. This result implies that broiler farmers fall within the economically active age group and has the potential for productivity, and also could bring about development to the poultry sector. This is in agreement with FAO (2013). This implication is that younger farmers are likely to adopt new innovation faster than older ones and their involvement in practicing adaptation is very encouraging.

Gender: The result of the study shows that majority of the broiler farmers studied were males (63%) while the remaining (37%) were females. Although both the male and female are involved in broiler production, the males

dominate possibly because of the rigorous work in broiler business. The poultry industry is associated with risks and uncertainties. The occurrence of these risks may discourage the female folks from going into the industry. Poor financial condition commonly associated with females could bear good reason why the females are less involved in capital intensive broiler production. This agrees with the findings of Akintunde et al (2015) who reported that majority (81%) of the poultry farmers were males.

Educational attainment: This study shows that majority (92%) of the farmers had completed primary, secondary and tertiary education. This educational level of attainment makes it easy to handle risks and disruption whenever they occur. This supports the findings of Aromolaran et al (2013) who concluded that majority of the poultry operators had acquired education and is capable of reducing the extent of risk in the business because an educated farmer can easily manage risk and uncertainty than the illiterate farmers.

Occupation: The result shows that majority of the broiler farmers are self-employed. This is an indication that enough time is dedicated to the daily run of the business. Farmers are able to supervise and monitor all the activities taking place in the farm. This self-employment makes it easy to detect any case of pilfering and also properly handle risks.

Marital status: Investigation into the marital status of the respondents shows that majority of broiler farmers are married constituting 51%. This is an indication that there is support from their spouse and children in carrying out farming activities thereby reducing the cost of labour and increasing productivity of the broiler business. This agrees with the findings of Akintunde et al (2015) who concluded in his study that the majority (85.6%) of the poultry farmers were married.

Broiler Enterprise Budget

The result of the broiler enterprise budget for production cycle one to four is presented in Table 2. The result showed that the average total cost of broiler production in the study area was ₦397,980 while the average total revenue was ₦748,250. The analysis showed that broiler producers earned ₦350,270 as average net profit. The result also showed that the average gross margin of broiler production was ₦357,510. The average net return on investment (NROI) of broiler production was 0.88k. This means that for every ₦1.00 invested in the business, the farmer makes a profit of 88k. This implies that broiler production is a profitable venture. This could be as a result of boost in the output due to gains from good poultry management practice.

Since broiler production brings quick returns lasting for about three months for a production cycle it therefore means that repeating the production cycle for about three to four times in a year will sustain the producers economically as observed in Table 2. This result is in line with the findings of Nasiru et al (2006) who reported that the poultry industry is profitable in as much as the resources are properly utilized. Prospective investors are therefore encouraged to go into the poultry sector.

Table 1: Distribution of Socioeconomic Characteristics of Respondents

Parameter	Frequency/Percentages	Mean/Mode
Age of farmer		
Below 30	2(2)	
31-40	22(23)	41-50 years
41-50	55(57)	
51-60	10(11)	
Above 60	7(7)	
Gender		
Male	60(63)	Male
Female	36(37)	
Educational Attainment		
No formal education	12(8)	
Primary school	17(19)	
Secondary school	32(35)	
Tertiary education	*35(38)*	Tertiary education
Occupation		
Farming	*24*(25)	
Trade	*19(20)*	
Self-employed	*48*(50)	Self-employed
Civil servant	*5*(5)	
Marital Status		
Single	*18*(19)	
Married	*49*(51)	married
divorced	*20(21)*	
widowed	*9*(9)	

Source: Field data (2017) *Figures in parenthesis are the corresponding percentage values*

Table 2: Broiler Enterprise Budget Litter change

S/No	Items	Production cycle 1N	Production cycle 2 N	Production cycle 3 N	Production cycle 4 N	Total Average
1	**Variable cost**					
I	Chicks	75000	52500	64260	50400	60540
Ii	Feeds	273800	255300	284900	228000	260500
Iii	Medication	25000	17000	20000	17000	19750
Iv	Hired labor	24000	16000	18000	16000	18500
V	Water	5000	3200	4400	3200	3950
Vi	Litter materials	3000	2500	2500	2500	2625
Vii	Transportation	7000	6000	7000	6000	6500
Viii	Heat and light (energy)	25000	12000	25000	11500	18375
	Total variable cost TVC	437800	364500	426060	334600	390740
2	**Fixed cost depreciation on**:					
Ix	Poultry house	4250	4250	4250	4250	4250
X	Drinking trough	1100	1100	1100	1100	1100
Xi	Feeding trough	1250	1250	1250	1250	1250
Xii	Wheel barrow	320	320	320	320	320
Xiii	Shovels	220	220	220	220	220
Xiv	Bucket	100	100	100	100	100
	Total fixed cost TFC	7240	7240	7240	7240	7240
	Total cost	445040	371740	433300	341840	397980
3	**Revenue**:					
Xvii	Matured broiler	825000	660000	826000	663000	743500
Xviii	Poultry waste	4500	4100	4700	1200	3625
Xix	Empty bags of Feed	500	1250	1500	1250	1125
	Total Revenue TR	830000	665350	832200	665450	748250
4	**Net farm income per birds cycle** NFI= TR-TC	384960	293610	398900	323610	350270
5	**Gross margin per birds cycle** GM=TR-TVC	392200	300850	406140	330850	357510
6	**Net return on investment** per cycle NROI=NFI/TC	0.87	0.79	0.92	0.95	0.88

Determinants of Risk on broiler profitability

Table 3 shows the result of the determinants of risk on profitability. The t-values indicated that five of the risk factors on returns were significant. These factors are litter change, biosecurity infrastructure, vaccination schedule, stocking density and net farm income (profit). The dependent variable is the percentage of observed risk.

The result of this study shows that litter change has a negative and a significant relationship with broiler performance at ($p<0.05$) probability level. It implies that increase in litter change will lead to decrease in risk of broiler production. This is in conformity with a priori expectation. Proper litter management is the most important step in avoiding bacteria, parasites and ammonia problems.

Biosecurity infrastructure: The result of this study shows that biosecurity infrastructure was negative and significant at ($p<0.05$) level. This means that a unit increase in biosecurity infrastructure will lead to a corresponding decrease in risk of broiler production. This agrees with a priori expectation because biosecurity infrastructure is capable of reducing risk impact. The biosecurity infrastructures includes; security personnel to safe guard the birds, feeds and farm equipments, presence of foot dip at the entrance of the poultry house, fence around the poultry house and available place for waste and dirt discharge. This finding supports Achoja and Okpara (2016) who observed the impact of biosecurity infrastructure on mortality risk and concluded that farmers are to make sure that relevant biosecurity infrastructures are provided in the farm.

Vaccination schedule: The finding of this study revealed that vaccination schedule is negative and statistically significant at ($p<0.05$) probability level. This means that increase in vaccination schedule will lead to decrease in risk of broiler performance. This implies that lack of proper vaccination schedule is capable of creating a significant risk impact. Vaccination schedule aids in achieving maximum benefits through maximum protection of flock against diseases. Vaccination schedule based on the parent flock vaccinations with slight variations based on season or prevalence of disease in area is helpful. This is because chicks hatched in an environment will face same disease challenges the hen faced in the past.

Stocking density: The result of the study shows that stocking density has a positive and significant relationship with the risk at ($p<0.05$) probability level. This implies that increase in stocking density will lead to a corresponding increase in risk of broiler production. Stocking density here has to do with over stocking above the holding capacity of the environment. The temperature of the poultry house is of great importance in broiler production hence spacing become necessary.

Net farm income (NFI): The coefficient of net farm income showed a significant and a negative relationship with risk at ($p<0.05$) probability level. This implies that a unit increase in net farm income will lead to a decrease in risk of broiler production.

Table 3: Regression Result on the Determinants of risk

Model	Coefficients				
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-33.333	11.433		-2.915	.007**
Effect of breeds of bird stock	2.788	8.485	.043	.329	.745
litter change	-9.171	4.464	.265	2.054	.049**
biosecurity infrastructure	-6.552	2.526	.278	2.594	.005**
vaccination schedule	-8.851	3.556	.439	2.489	.019**
feeding regime	1.898	6.707	.056	.283	.779
stocking density	1.385	.439	.787	3.152	.009**
NFI (profit)	-7.570	1.815	.522	4.172	.002***

*R^2 = 70.8%, F cal=11.337, **= significant at 5%, *= significant at 10%.*

CONCLUSION AND RECOMMENDATION

Determination of firm's risk status is vital for the growth and development of the poultry sub-sector especially broiler production. From this study it was revealed that returns on investment can only improved if drastic action is urgently taken to reduce the magnitude of the risk factors facing the farmers. Broiler production is viable in the study area. The result revealed that the average total production cost of broiler in the study area was ₦397,980 while the average total revenue was ₦748,250. This resulted in a net profit of ₦350,270 and 0.88k for the average net return on investment(NROI). The result of the study shows that litter change, biosecurity infrastructure, vaccination schedule, stocking density and profit have a relationship with the returns of broiler farms. It is recommended that government should assist the farmers with soft loan to improve on any of the risks determinants in the study area since the individual net profit was ₦3,648.65. This is less than the minimum wage of ₦18,000 per month. This explained the need for credit to assist the broiler farmers in purchasing of production inputs because they earned less than their required income for greater productivity. The observed household income values (₦ 121.60 per day) revealed wide spread abject poverty.

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