

## SOCIO-ECONOMIC CHARACTERISTIC AND PROFITABILITY ANALYSIS OF RABBIT PRODUCTION IN ONDO STATE, NIGERIA

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### ABSTRACT

The study examined the prospects and challenges of rabbit production in Ondo State, Nigeria, with a view to determining among other things the profitability of rabbit farming, level of acceptability of rabbit meat as well as the constraints hampering rabbit production in the study area. The study revealed that 80% of the respondents are male, 86% are literate with higher educational qualification, 78% are agricultural science specialists and 76% are civil servants. The mean flock size of the respondents is 28 rabbits. The likert rating scale on perception showed that respondents disagree that consumers are aware of the importance of rabbit meat, with a mean score of 3.44. The gross margin revealed that rabbit production had a profit margin of N13,700/Respondent/Month. The correlation analysis showed a significant relationship between gross margin and years of experience with r-value of 0.688 and P-value of 0.002 which makes the null hypothesis to be accepted. The regression analysis has R<sup>2</sup> value of 0.589 which implied that about 59% variation in the dependent variable is explained by the independent variables. The major constraint faced by respondents is the absence of a ready market for rabbit with a mean score of 4.02 on the likert rating scale.

**Keywords:** Characteristic, Production, Profitability, Rabbit, Socio-economic.

### INTRODUCTION

In Africa, Nigeria is the largest importer of frozen fish Onebunne, (2013) and requires approximately 1.5 million tons of fish and meat annually to meet demand. Current domestic supply is about 0.5 million tons (over 30 percent of demand) including massive importation which gulps over N20 billion annually Onebunne, (2013).

The human population growth in developed countries is stabilizing while that of the developing countries including Nigeria is still increasing rapidly (Carl Haub 2012)), In Nigeria, consumption of animal protein remains low at about 6.0 – 8.4g/head/day which are far below the 13.5g/head/day prescribed by (Egbunike, 1997). Thus, the search for more sources of protein to meet up this and the population challenge. Economic indices indicate that as this population trend continues, indigenous agricultural outputs needs to be increased rather than through food importation into such countries. Owen et al (2008), opined that in order to maximize food production and meet protein requirements in Nigeria, viable options need to be explored and evaluated. Among such alternatives is the use of livestock species that are yet to play a major role in animal production within these countries. Rabbits possess a number of features that might be of advantage in the small holder subsistence-type integrated farming in developing countries (Mailafia, et al 2010). The preliminary market analysis by the International Finance Corporation (IFC) suggests that an additional 25,000 tons or 100 percent increase in current production of animal protein in Nigeria can easily be absorbed (Onebunne, 2013), Cattle which could have been another major source of protein is being drained by desert encroachment, pest attacks and other factors. Mini-livestock production like grasscutter, guinea pig, porcupine, snail and rabbit is thus placed on the spotlight as the best option for food security in the country today.

Rabbit farming is a rewarding business with high probability of recouping original investment (Onebunne, 2013). It is a veritable way of alleviating animal protein deficiency in Nigeria (Ajala and Balogun, 2004). The rabbit has immense potentials and good attributes which include high growth rate, high efficiency in converting forage to meat, short gestation period, and high prolificacy, relatively low cost of production, high nutritional quality of rabbit meat which include low fat, sodium and cholesterol levels. It also has a high protein level of about 20.8% and its consumption is bereft of cultural and religious bias (Biobaku and Oguntona 1997). The presence of caecal microbes enable the rabbit to digest large amounts of fibrous feed as most non-ruminant species cannot (Taiwo et al, 1999). Consequently, expansion in rabbit farming will not only generate jobs and income for farmers but will also create small-scale business for market mummies and restaurants (Onebunne, 2013).

Rabbit farming in Nigeria is faced with myriads of problems, which have resulted to a gross shortage of meat to meet up the population challenge in the country (Nworgu, 2007). The growth rate of the Nigerian agricultural sector is below the potentials of natural and human resources due to high cost of agricultural inputs, poor funding of agriculture, inadequate functional infrastructural facilities, inconsistency of government agricultural policies, inadequate private sector participation, poor mechanized farming and little or no adoption of some simple agricultural technologies developed by scientists (Nworgu, 2007).

On gender involvement, Niamir-Fuller (1994) and Onifade et al (1999) observed that Women typically have complete responsibility for animals that are kept close to the homestead, in most cases for domestic consumption, such as poultry, calves rabbits and other small livestock, and for sick animals. Women rarely have major herding and management responsibilities for large stock but men, although there are exceptions as among the Touareg in Algeria, Mali and Niger, and sometimes among women in The Sudan. Women in transhumant systems in Somalia herd cattle, sheep and goats, while men take care of the camels.

Judging from health talks, seminars and enlightenment campaigns about the nutritional and health value of rabbit meat, one would have expected its production to be up in neck with poultry and piggery, but this is far from it. Information on the challenges and prospects of rabbit farming in Nigeria is scanty. Few of the information available are unable to elucidate the major intricacies involved in rabbit farming (Mailafia, et al 2010). This view was corroborated by Abu, et al (2008) in the status of research on rabbits as source of animal protein in Nigeria. Out of one hundred and ninety three (193) Postgraduate theses spanning 1969 – 2006 in the department of Animal Science, University of Ibadan, Nigeria which were collated and analysed, only 6 (3%) involved rabbits for research. Two theses were in the area of nutrition, two on rabbit processing and consumer acceptance and the remaining two were in the area of reproductive physiology. Rabbit production offers a great potential for the attainment of food security in terms of provision of high quality animal protein intake, generate income for small-holder farmers as well as reduction of mass unemployment plaguing the nation.

It is obvious that the use and production of rabbit is considerably low compared with other livestock and poultry, hence the focus of this study to examine the socio-economic characteristics of rabbit farmers, acceptability of rabbit meat, the constraints to rabbit production, and to ascertain the costs and returns, hence the profitability of rabbit production.

## METHODOLOGY

### Study Area

This research work was carried out in three Local Government Areas – Akure South (Akure, Ipinsa, and Oda), Akure North (Oba-ile, Igoba, Ogbese, Araromi, Igbatoro, Eleyewo, Ilu-Abo, Iju and Ita-Ogbolu) and Ifedore (Igara-Oke, Irese-Ibule and Ijare) in Ondo state. These areas are noted for high concentration of livestock farms particularly rabbit keepers in Ondo State, Nigeria, West Africa.

The state contains eighteen Local Government Areas, the major ones being Akoko, Akure, Okitipupa, Ondo, and Owo. The majority of the state's citizens live in urban centers. Akure is a city in south-western Nigeria(Wikipedia 2013) located  $7^{\circ}15'0''N$   $5^{\circ}11'42''E$ . It is the largest city and capital of Ondo State with population of 387,100(Wikipedia 2014). The people are of the Yoruba ethnic group. Akure is the trade center for a farming region where cocoa, yams, cassava, corn and tobacco are grown. Cotton is also grown and used to weave cloth.



Figure 1. Map of Nigeria, Ondo state highlighted

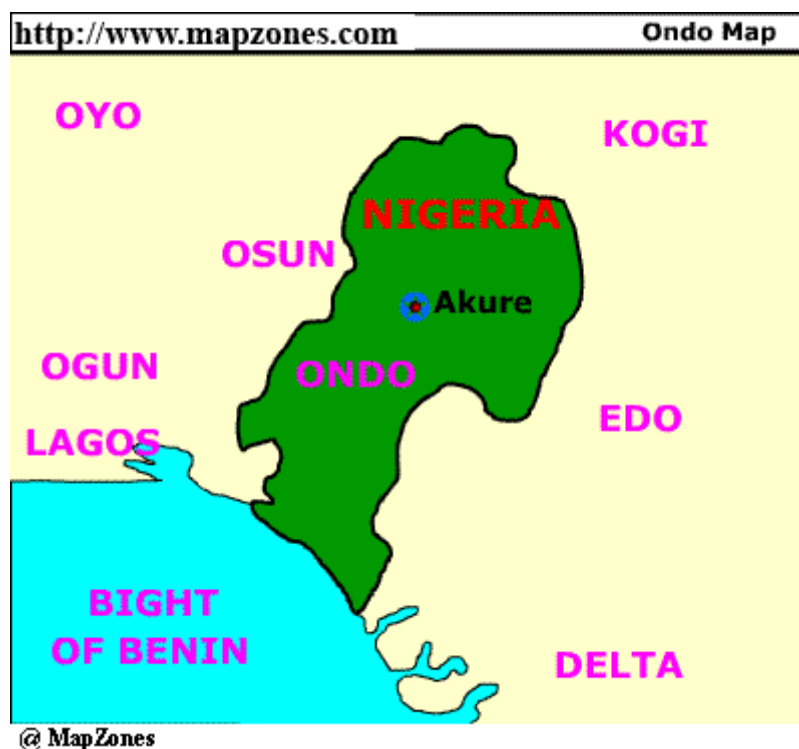


Figure 2. Map of Ondo state, its capital(Akure) and the neighboring states

## Method of Data Collection

Data used for this study were obtained through the use of structured questionnaire. Personal interview were conducted with the farmers to elicit the information required, on socio-economic status, reproductive potentials, costs and returns as well as constraints on production.

## Sampling Techniques

A total of 50 questionnaires were administered to established rabbit farmers based on available records with Ondo State Agricultural Development Project within the target area i.e towns within the three Local Government Areas Akure South, Akure North and Ifedore

## Method of Data Analysis

Data collected were analysed using the following tools: Descriptive statistics, Gross Margin, Correlation and Regression. Descriptive statistics such as frequency distribution, percentages and bar charts were used to analyse data on socio-economic characteristics. Gross margin analysis was used to estimate costs and returns of rabbit farmers. The gross margin (GM) represents the difference between Total Revenue and Total Variable Costs.

$$GM = TR - TVC.$$

Correlation analysis was used to determine the relationship between sosio-economic characteristics of respondents and the profits derived from rabbit production. The regression model was used to determine the relationships between profitability and other variables. The model was tested using different functional forms. The stated equation for the model is:

$$Y = B_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + \epsilon_i$$

Where Y = Profit

X<sub>1</sub> = Sex

X<sub>2</sub> = Educational level

X<sub>3</sub> = Area of specialization

X<sub>4</sub> = Years of experience

X<sub>5</sub> = Motive of raising rabbits

$\epsilon_i$  = Error term

## RESULTS AND DISCUSSION

Table 1: The result in table 1, shows that majority of the respondents are male (80%) while 20% are female.

Table 1: Distribution of Respondents According to Gender

Gender	Frequency	Percentage (%)
Male	40	80
Female	10	20
Total	50	100

Table 2: The result in this table shows that majority of the respondents (86%) are educated to the tertiary level. 14% had secondary education. This implies that it is mainly the educated people that are involved in the rearing of rabbits thus making it a hobby rather than business.

Table 2: Distribution of Respondents According to Level of Education

Level of Education	Frequency	Percentage (%)
No formal Education	-	-
Adult literacy	-	-
Primary	-	-
Secondary	7	14
HND,BSc,MSc/PhD	43	86
Total	50	100

Table 3: The result in this table shows that 78% of the respondents are specialists in the field of agriculture. Only 11% of the respondents are not agricultural experts.

Table 3: Distribution of Respondents According to Area of Specialization

Specialization	Frequency	Percentage (%)
Agricultural Sciences	39	78
Others	11	22
Total	50	100

Table 4: The result in this table shows that most of the respondents are civil servants with 76%, farming accounts for 18% while artisans are 6%.

Table 4: Distribution of Respondents According to Major Occupation

Major Occupation	Frequency	Percentage (%)
Farming	9	18
Artisan	3	6
Civil Servant	38	76
Total	50	100

The result in table 5 shows the different motivation for rabbit farming. 16% are involved in rabbit farming due to low cost of production, 6% are involved because of the short gestation period, 20% are involved due to the ease of management, 8% are motivated due to the high nutritional quality of the meat. 50% of the respondents are involved due to the combination of the above mentioned motive.

Table 5: Distribution of Respondents According to Motives of Production

Motive of Production	Frequency	Percentage (%)
Low cost of production	8	16
Short gestation period	3	6
Ease of management	10	20
High nutritional quality of meat	4	8
All of the above	25	50
Total	50	100

The result in table 6 shows that 22% of the respondents have between 1-5 years experience, 34% have 6-10 years and 11-15 years respectively, 6% have 16-20 years while 4% have above 20 years experience in rabbit farming. The mean year of experience was estimated to be 10 years. This indicates that the respondents have been in the business of rabbit production for a considerable number of years.

Table 6: Distribution of Respondents According to Years of Experience

Years of Experience	Frequency	Percentage (%)
1 – 5	11	22
6 – 10	17	34
11 – 15	17	34
16 – 20	3	6
Above 20	2	4
Total	50	100

### Correlation Analysis

Table 7 shows the relationships between some variables and gross margin. The correlation value for years of experience is significant. We therefore accept the H<sub>0</sub> hypothesis, implying that experience counts in rabbit production. Sex and education level are not significant. This means that sex or educational status is not a criteria for successful rabbit production.

Table 7: Correlation Result of Socio-Economic Characteristics and Profitability of Rabbit Production

Relationship	r value	P-value	Significant	Decision
Sex vs GM	-0.099	0.697	NS	Reject H <sub>0</sub>
Education vs GM	-0.151	0.550	NS	Reject H <sub>0</sub>
Years of Experience vs GM	0.688	0.002*	S	Accept H <sub>0</sub>

Correlation is significant @ 0.05 level. GM is Gross Margin

The result in table 8 shows the respondents' perception to rabbit meat in terms of its acceptability. Respondents' perception was measured using the likert rating scale shown below:

SA-Strongly Agree A-Agree U-Undecided D-Disagree SD-Strongly Disagree

Respondents' perception about consumers awareness of the importance of rabbit meat has a mean score of 3.44 which tends towards disagreement, which means that consumers are not well informed about the importance of rabbit meat. Demand for rabbit, consumption of rabbit, access to rabbit meat like other livestock as well as rabbit meat is expensive has mean scores of 4.02, 4.58, 4.2 and 4.2 respectively. This means that respondents disagree with these notions as being responsible for the apathy to rabbit production.

It also shows that the mean score of some perceptions tend toward agreement. Respondents' perception about the nutritional quality, medicinal value, preference for rabbit meat, inadequate sensitization as well as the fact that more information is needed about the importance of rabbit meat has mean scores of 1.44, 1.48, 2.16, 1.2 and 1.1 values. Respondents agree to these perception as vital impetus which could spur more people into rabbit production and consumption.

Perception Statements	SA F(M)	A F(M)	U F(M)	D F(M)	SD F(M)	Mean Score	Remark/ Decision
i)Consumers are aware of the importance of rabbit meat.	6 (0.12)	10 (0.4)	-	24(1.92)	10(1)	3.44	Disagree
ii)Rabbit meat has high protein and low fat	28(0.56)	22(0.88)	-	-	-	1.44	Agree
iii)Rabbit meat has medicinal value	27(0.54)	22(0.88)	1(0.06)	-	-	1.48	Agree
iv)Rabbit meat has high demand	2(0.04)	2(0.08)	1(0.06)	33(2.64)	12(1.2)	4.02	Disagree
v)Consumption of rabbit meat is restricted by particular beliefs	-	-	1(0.06)	16(1.28)	33(3.3)	4.58	Disagree
vi)I prefer rabbit meat to other meat type	13(0.26)	25(1)	4(0.24)	7(0.56)	1(0.1)	2.16	Agree
vii)Consumers have access to rabbit meat like beef, turkey and chicken	2(0.04)	-	-	32(2.56)	16(1.6)	4.2	Disagree
viii)Rabbit meat is more expensive than beef, turkey and chicken	-	2(0.08)	5(0.3)	24(1.92)	19(1.9)	4.2	Disagree
ix)There is no enough sensitization to change peoples perception about rabbit meat	40(0.8)	10(0.4)	-	-	-	1.2	Agree
x)More information is needed about the importance of rabbit meat	45(0.9)	5(0.2)	-	-	-	1.1	Agree

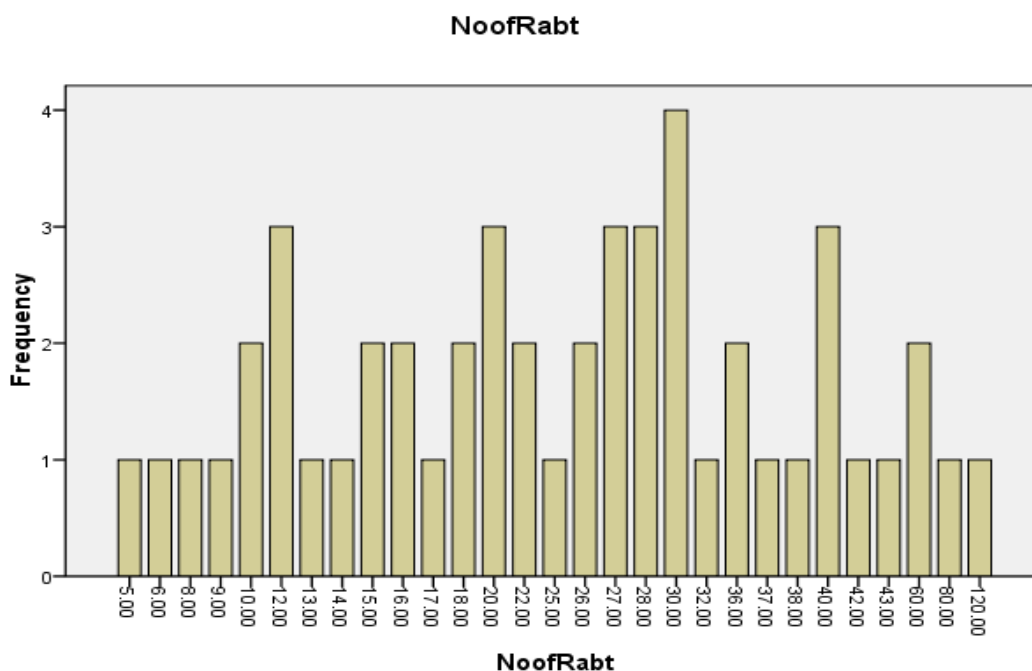
Table 8: Respondents Perception About Rabbit Consumption.

Grand Mean: 2.78

Key: 1-Strongly Agree 2-Agree 3-Undecided 4-Disagree 5-Strongly Disagree F-Frequency and Mean in parenthesis

Key: NoofRabt = Number of Rabbit

The graph in Figure 3 shows the distribution of the number of rabbits raised by the respondent. The mean value of rabbit raised by the 50 respondents is 28 rabbits. This is an indication that rabbit production in the study area is basically at the subsistence level.





## Gross Margin Analysis

The gross margin tool is used to determine the profitability of rabbit production among the respondents. The gross margin is the difference between the total revenue and total variable cost.

$$\begin{aligned} \text{Gross margin (GM)} &= \text{TR} - \text{TVC} \\ \text{GM} &= 6.85 \times 10^5 \\ \text{TR} &= 8.51 \times 10^5 \\ \text{TVC} &= 1.66 \times 10^5 \\ \text{N}685,000 &= \text{N}851,000 - \text{N}166,000 \\ \text{GM} &= \text{N}685,000/50 \text{ Respondents/Month.} \\ \text{GM/Respondent/Month} &= \text{N}685,000/50 \\ &= \text{N}13,700.00. \end{aligned}$$

It can be inferred that rabbit production is profitable with the gross margin value of ₦13,700.00 more so that most of the respondents are using it as an additional source of income. On a commercial level, better profit margin can be anticipated.

This study showed that men (80%) are more involved in rabbit production (Table 1), mostly the educated (86%) gainfully employed civil servants (tables 2,3 and 4.) who took it as secondary, or as a hobby to practice their skill as agriculturist(78%) for domestic consumption, and not necessarily for commercial purpose, showing that none of the respondents was interested in investing in the production at commercial level this is in agreement with Colins and Lebas (1996); Lukefahr (2007); Oseni et al ( 2008), despite the number of years of experience - average 10 years (tables 5 and 6).The graphical representation of the frequency of involvement in the rabbit production is shown in figure 3. This study however did not agree with Niamir-Fuller (1994) and Onifade et al (1999) observations that women typically are more involved in animals that are kept close to the homestead, such as poultry, calves, rabbits and other small livestock, and for sick animals, but agreed that women rarely have major herding and management responsibilities for large stock, especially with the male gender and the literacy level (Onifade et al 1999) of the respondents observed in this study.

Despite the increasing awareness of the value of rabbit meat in Nigeria, the study did not show any indication that rabbit meat is imported into the country even with the low level of production, the advantage the rabbit farmers can take for large stock production and create enough market to meet the need of the people. However it agreed with Onifade et al (1999) finding that many of the respondents are ignorant of rabbit's unique potential such as, the nutritional and the medicinal values, ready source of income and the ease and low cost of production.

## CONCLUSION AND RECOMMENDATION

The socio-economic characteristic of rabbit production with respect to awareness and acceptability in relation to its unique potentials and good attributes, which include high growth rate, high efficiency in converting forage to meat, short gestation period, and high prolificacy, relatively low cost of production, the high nutritional quality of the meat, which include low fat, sodium and cholesterol levels together with high protein level of about 20.8% which is bereft of cultural and religious bias(Biobaku and Oguntona,1997) and the presence



of caecal microbes which enables the rabbit to digest large amounts of fibrous feed as most non-ruminant species cannot (Taiwo et al. 1999), and therefore can be sustained on forage has been established in this study to be very low. Taking advantage of these attributes for its production will increase the protein intake per head, reduce nutritional diseases, create employment and revenue or income in livestock industry, and commercialization.

The role of the Government in creating awareness in form of education and extension services is equally important to create market for the meat, and availability of short term loans for commercial production, will motivate people into rabbit farming.

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