



## Analyses of Quail Production, Management and Constraints in Ondo State, Nigeria

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### Abstract

Quail farming is increasingly being practiced in Nigeria and many parts of the world as a viable poultry production agribusiness. The study examined quail production, management and constraints in Ondo State, Nigeria. It described farmers' socio-economic characteristics; evaluated effects of inputs were on quail production, identified management practices and constraints faced by farmers. Multi-stage sampling technique was applied in selecting 40 quail farmers. Data obtained were analyzed using descriptive statistics, multiple regression and mean score. The results showed that most (42.5%) of the respondents were within their productive age, with mean age of 50 years and mean household family size of 9 persons. The results of regression analysis showed that feeds (1.803), drugs (0.638) and vaccines (7.611) had significant effects on quail production. In inadequate capital ( $\bar{X}=2.78$ ), high cost of feed ( $\bar{X} = 2.72$ ), high cost of equipment ( $\bar{X} = 2.70$ ), high cost of drugs and vaccine ( $\bar{X} = 2.60$ ) and diseases and pests outbreak ( $\bar{X} = 2.40$ ) were the constraints faced by farmers in the area. Therefore, government should assist animal breeders to come out with quail breeds that are highly prolific and disease resistance. Also, quail farmers should source for credit from financial institution (formal and informal) to expand the scope of their production.

**Keywords:** Quail, Effect, Management, Production, Constraints

### Introduction

Quail (*Cortunix cortunix Japonica*) is a native of Asia and Europe. Poultry production is a major unit dominating livestock industry in Nigeria (Adelomo and Owoye, 2017). Recently, there are new entrants into livestock production segment of agribusiness. Quail is one of the birds that is newly gaining prominence and it's commercially raised for meat and egg production through intensive management (Egbeyale *et al.*, 2013). Its feed consumption rate is lower than chicken and the space required for housing quail is relatively small in comparison with other bigger birds such as chicken, turkey, geese and guinea fowls (Ijaiya *et al.*, 2013). Ojo *et al.* (2011) stated that the cost of quail production is cheaper and the returns are gotten within a short period. Quail is highly resistant to infestation caused by diseases which commonly affect other poultry birds,

thus, it requires less drugs and vaccine dosages, yet with high rate of egg production (200 – 300 eggs) within a year (Bakoji *et al.*, 2013).

Quail farming is seen as one of the most promising aspect of the poultry unit to bridge the animal protein gap of the citizens (Muhammad-Lawal *et al.*, 2017). Their meat and eggs are renowned for their high quality protein, high biological value and low calorie content, making it a choice product for hypertensive patients (El-Katcha *et al.*, 2014). According to Hemid *et al.* (2010), it exhibit early sexual maturity which lead to a short generation interval, high laying capacity and lower feed consumption. The nutritional benefits of quail especially the eggs cannot be over emphasized. It is highly rich in Vitamin D, antioxidants which improves food annual origin in terms of colour,

tenderness, oxidative and storage properties. Quail helps in reducing stress, high blood pressure, digestive problems, depression and other illness of humans (Sahin *et al.* 2008). Eggs produced by quails also help in stimulating sexual appetite, brain functions and so on. The nutritional value of quail eggs is 3–4 times greater than eggs of other poultry birds such as fowl (Tunsaringkam *et al.*, 2013). Quail eggs are also known to increase sexual appetite, stimulate brain functions which improve intelligence quotient and generally rejuvenate the body. Consumption of quail eggs fortifies the woman's body during pre and post-natal periods as well as after surgery and radiotherapy (Onyewuchi *et al.*, 2013). In addition, the meat of quail has better taste than chicken coupled with low fat content.

The food and agriculture organization (FAO) recommends minimum per capita daily protein intake of 53.8g, while the daily intake is 64g globally, but in Nigeria people consume an average of 45.4g (FAO, 2020). Nigeria is ranked below the bar in global food security index with a protein per capita – daily intake lower than the global standard as mentioned. Protein nutritional insecurity is still prominent in Nigeria and chicken meat and egg which has been the major source of animal protein is still not unable to meet the protein hunger of the country (Liverpool-Tasie *et al.*, 2017). Although, the demand for quail and its products is increasing rapidly due to the medicinal, nutritional and economic benefit, yet limited research has been conducted on quail production in many parts of Nigeria by few authors like (Adeoti and Baruwa, 2019; Olorunsogo *et al.*, 2016; Mere *et al.*, 2017), but low or paucity information are found in the study area. Hence, the urgent need for this study considering the nutritional and health benefit of this “Small but mighty bird”. Therefore, the study mainly provides information on quail production, management and constraints faced by the respondents in the study area. Thus, the study considered the following specific objectives:

1. describe the socio-economic characteristics of quail farmers in the study area;
2. determine the effects of some inputs on quail meat and egg production;
3. identify the management practices used by quail farmers during production in the study area;
4. identify major constraints facing quail farming in the study area.

## Methodology

### Study Area

The study was conducted in Ondo State, Nigeria (A case study of Akoko North-West Local Government Area (LGA). The area is located in the western part of the state in the Yoruba hills (elevation 1,300 feet) and lies between Latitude 7°5'N and 6°3'NS of the equator and the Longitude 5°43'E and 6°35'E. The area is characterized with a tropical climate, distinct wet and dry seasons. The annual temperature varies between

27°c and 37°c with relative humidity between 30% and 40% in January and rising to 70% - 80% in July and August. The major occupation of the people is crop and livestock production as well as civil service, craft and trading.

### Sampling Procedure

A multi-stage sampling technique was adopted for the study. Firstly, Akoko North-West LGA was purposively selected in Ondo State, because quails are raised by sizeable numbers of farmers in that area. Secondly, all the four districts (Ajowa, Arigidi, Okeagbe, Irun/Surulere) in the LGA were selected. At the third stage, two (2) farming communities were randomly selected from each district, giving a total of 8 farming communities. Lastly, five (5) quail farmers were randomly selected from each farming community making a total sum of 40 respondents.

A well-structured questionnaire with scheduled interview was used to harvest primary data from the sampled quail farmers.

### Data Analysis

Data obtained was analyzed using descriptive statistics, multiple regression analysis and mean score.

### Model Specification

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + e_i$$

Where,

Y = Quail produce (Numbers)

X<sub>1</sub> = Quantity of feed (kg)

X<sub>2</sub> = Drugs (mls)

X<sub>3</sub> = Vaccine (mls)

X<sub>4</sub> = Labour (mandays)

X<sub>5</sub> = Water (liters)

X<sub>6</sub> = Birds at initial production (numbers)

e<sub>i</sub> = error term

Where b<sub>1</sub> . . . b<sub>6</sub> are coefficients estimated and X<sub>1</sub> . . . X<sub>6</sub> are the explanatory variables defined in equation above, e<sub>i</sub> is the error term

### Likert Scale

A three - point Likert type of scale was used to identify the constraints facing quail farmers as specified thus: Very Serious (VS)3; Serious (S)2; Not Serious (NS)1. The mean response to each item was calculated using the following formula:

$$X_s = \frac{\sum fn}{N}$$

Where: X = mean response,  $\sum$  = summation, f = number of respondents choosing a particular scale point, and N = total number of respondents to the item. For constraints that affect quail farming, the mean response to each item was interpreted using the concept of real limits of numbers. The numerical value of the scale points (Response modes) and their respective real limits are as follows:

Not Serious (NS) = 1 point with real limits of 0.5-1.49, Serious (S) = 2 points with real limits of 1.50-2.49, Very Serious (VS) = 3 points with real limits of 2.50-3.49.

**Decision Rule:** Any mean score of 2 and above was considered as serious, while any mean score less than 2 was considered as not serious.

## Results and Discussion

### *Socioeconomic Characteristics of the respondents*

The results in Table 1 showed that majority (80%) of the respondents were male. According to the respondents, the poultry business is considered to be laborious and quite a risky venture, a lot of boldness and courage is therefore required before one can venture into it, and this explains why the industry attracts more male than female. The results confirm the findings of Muhammad *et al* (2017) who discovered that 54.7% of quail farmers were male in their study on economics of quail production in Ilorin, Kwara State, Nigeria. The study showed that 42.5% of the respondents were within 40-49 years, whereas the mean age of respondents was 50 years. The respondents were young, active and energetic to carry out all the rigors involved in quail production. This is in agreement with Mishra and Godwin (2005) who suggested that younger people are more adventurous than older ones are less risk averse than older farmers. The results also discovered that 90% of the respondents were married. Since marriage confer responsibility on the respondents, thus they found quail production as means of generating income to care for their family, since the married are suppose to be responsible according to societal standard (Bakoji *et al*, 2013). The results also showed that the mean household size of the respondents was 8 which justified that they were truly married and have more mouths to feed. On the other hand, if the members of the respondents' household were available, they could be sources of assistance to the farmers in their quail production activities. These results showed a better year of experience in quail production in the study area than the findings of Adeoti and Baruwa (2019) where they indicated a mean of 3 years farming experience in their study. However, low level of farming experience recorded among quail farmers in the area showed that quail production is still relatively new in the area. Thus, farmers with more years of experience are likely to be more efficient and make more profit than those who had low or no experience (Bakoji *et al.*, 2013).

The results further showed that 80% of the respondents attained one form of education or the other (primary, secondary and tertiary education). This suggests that the respondents' ability to read and write was an added advantage for efficient management. With this level of educational attainment, there is tendency for the farmers to access and adopt new technology and skill.

### *Effects of Variable inputs on Quail Production*

The results in Table 2 showed the effect of variable inputs used on quail egg production. The results of Linear functional form of the model was chosen, because it gave the best fitted result. The result indicated an  $R^2$  value of 0.778 meaning that 78% of the variability in the model was explained while the remaining 22% could be attributed to error term. The F-value was 18.441 at 1% level of significance which means that the independent variable jointly explained the dependent variable. The results showed that feeds, drugs, vaccines, labour, water and chicks were significant variables that affect quail meat and egg production in the study area.

The results revealed that feed was significant at 1% and was positively signed. By implication, the higher the quantity of feed supplied, the higher the meat and egg production by quail. When feed quantity is given in appropriate quantity and utilized by the bird the higher the quantities of eggs they will lay and also affect their meat subsequently, which later transform into higher income for the farmer. The administration of drugs and vaccines to the birds also had significant effect on their production and the coefficient was positively signed. This implies that as the birds are well taken care of by treating them or vaccinating them with drugs these have positive effect on their well-being and overall production in terms of egg and meat production. Labour was another variable input that had significant effect on quail production. The more the labour expended in terms of sanitation, brooding, feed and water supply among others the more the quail produced since the hygienic condition drives away pests and diseases from their pens and adequate water and feed supply provide good ground for better production of both eggs and growth flesh-wise respectively.

### *Quail Production Management Practices*

The results in Table 3 showed the management practices carried out by the respondents. The respondents as indicated provided clean water (100%) to the birds. All respondents (100%) removed dead birds immediately and properly disposed them. Also, the results further indicated that the respondents provide high quality feeds (100%) to the birds. Moreover, keeping pen floor dry (95%), keeping the quails from other birds, rodents and vermin's (97.5%), isolation of sick birds (90%), provision of adequate light (92.5%), consulting of veterinary doctor for treatment (80%) while provision of warmth to the newly hatched chicks (75%) were practiced by the farmers. These findings agreed with the findings of Randall and Gerry (2008) where they discovered that pen should be designed to ensure comfort for the birds, make food and water readily accessible and to permit easy and effective sanitation. Quail houses should have proper ventilation system so as to allow proper flow of air and light inside the cage and it should be out of the reach of wild animals and other predators. One of the advantages of raising quail is the relatively small space that is required. Availability of high quality feed is a pre-requisite for improved quail production and productivity. To ensure the quails are healthy, growing properly and are highly productive, they should be provided with balanced feed regularly (Onyewuchi *et al.*, 2013). According to Wilson and Douglas (2003), presence of adequate light is highly recommended for desired egg production from quails. Also, adequate lightening can enhance all year round egg production in quail.

### *Constraint militating against Quail Production*

The results in Table 4 showed the constraints faced by quail farmers during production. From the results capital was ranked the most serious problem with a mean score of 2.78, which is a very significant constraint. This study agrees with the study of Anosike

*et al.* (2018) that capital is still the major hindrance to poultry production. Quail farmers in the study area find it difficult to obtain loan from banks because of high interest rate and inability to meet the collateral requirements. High cost of feed was rated as the next serious problem because of the high cost of purchasing feed. The mean score of high cost of feed is 2.72, which is a significant constraint in agreement with the findings of Anosike *et al.* (2018). Cost of feed constitute the largest proportion of total cost in poultry production, therefore farmers find it difficult to purchase feed because of the high cost involved. High cost of equipments was the next rated constraint with a mean score of 2.70, which is a significant constraint. Farmers buy input used in broiler production at a high price without government subsidy. High cost of labour was the next problem rated by quail farmers in the study area with a mean score of 2.63, which is a significant constraint to quail production. Most farmers do not have the cash to pay when labour is hired. This finding agreed with work of Emeyonu and Okafor (2003) that poultry farmers in Nigeria are face by some problem such as high cost of production inputs. High cost of drugs and vaccine was the next rated problem by quail farmers in the study area with a mean score of 2.60, which was a serious constraint to quail production. Drugs and vaccine is very important in quail production because it reduces the rate of mortality. Farmers purchase drugs and vaccine at a very high cost with no subsidy. The results agreed with the findings of Bakoji *et al.* (2013) who asserted high cost of inputs for quail production in their study. Poor marketing of product in the study area is also another significant constraint with a mean score of 2.50. Most of the quail farmer don't have ready buyer of their product. The study agrees with Arthur (2013) who reported that Individual producers have to find their own market. Disease and pest problem was the next rated problem by quail farmers in the study area with a mean score of 2.40, which is a significant constraint to quail production. This finding was against the findings of Adelomo and Owoeye (2017) who discovered that diseases and pests outbreak were not serious constraint in their study on economic analysis of quail production in Southwest, Nigeria, though the two areas are within the same geo-political zone. Lack of technical know-how was rated as a serious problem to quail production in the study area with a mean score of 2.30. Most farmers in the study area lack the technical skills required in quail production (Rahman *et al.*, 2016). Lack of contact with extension is another problem rated by quail framers in the study area with a mean score of 2.20. This concur with the findings of Atala (2008) who observed that the role of extension is particularly important primarily because of the low productivity of farmers arising mainly from the use of traditional technologies, as such the introduction of improved inputs and agricultural practices are requisite for increased production in agricultural development in general. However, high cost of water and lack of storage facilities were rated as not a serious problem to the production of quails in the study area with a mean score of 1.68 and 1.70 respectively.

## Conclusion

The study determined the factors influencing quail production in Ondo State, Nigeria (A case study of Akoko North-west Local Government Area). The findings of this study indicated that male farmers who were married and productive dominated quail production in the study area. The study found quail production profitable with diverse management practices such as provision of clean water, adequate quality feed provision, vaccination among others. Also, quail output (egg and meat) were significantly influenced by the quantity of feed intake, administration of drugs to prevent or control pests and diseases, the available labour to manage the birds as at when due at 1% and 5% levels respectively. However, quail farmers in the area were confronted with diverse constraints in their production activities which include inadequate capital, high cost of feed, high cost of equipments, high labour cost, high cost of drugs and vaccines among others. Therefore, quail farmers should source for capital from financial institution within their reach or form an association where fund can be raised for quail business expansion. They should also link up with extension services and other sources of information to get update on new technology involved in quail production, management practices and proffer solution to their peculiar constraint(s).

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**Table 1: Distribution of Respondents According to Socio-economic Characteristics**

socioeconomic variables	Frequency	Percentage	Mean/Mode
<b>A. Gender</b>			
Male	32	80.0	Male
Female	8	20.0	
<b>Total</b>	<b>40</b>	<b>100</b>	
<b>B. Age</b>			
30-39	3	7.5	50 years
40-49	17	42.5	
50-59	15	37.5	
60-69	4	10.0	
70-79	1	2.5	
<b>Total</b>	<b>40</b>	<b>100</b>	
<b>C. Marital status</b>			
Single	2	5.0	Married
Married	36	90.0	
Divorced	2	5.0	
<b>Total</b>	<b>40</b>	<b>100</b>	
<b>D. Household size</b>			
1-5	10	25.0	9 members
6-10	19	47.5	
11-15	7	17.5	
16-20	4	10.0	
<b>Total</b>	<b>40</b>	<b>100</b>	
<b>E. Farming experience</b>			
1-5	16	40.0	8 years
6-10	13	32.5	
11-15	7	17.5	
16-20	4	10	
<b>Total</b>	<b>40</b>	<b>100</b>	
<b>F. Level of Education</b>			
Non formal education	8	20.0	Primary education
Primary Education	12	30.0	
Secondary Education	9	22.5	
Tertiary Education	11	27.5	
<b>Total</b>	<b>40</b>	<b>100</b>	

Source: Field Survey, 2021

**Table 2: Regression result on the influence of farm inputs on quail output in the study area**

Variables	Linear	Semi-Log	Double-Log
Constant	5957.115(0.936)	-49129.118(0.000)	11.098(0.000)
Feed (Kg)	1.803(0.001)***	6997.197(0.096)	1.0005(0.507)
Drug ( milliliters)	0.638(0.012)**	290.447(0.000)*	6.66(0.000)*
Vaccine (litres)	7.611(0.032)**	1435.274(0.001)*	1.095(0.087)
Labour (Mandays)	0.560(0.049)**	-2604.033(0.962)	-.010(0.578)
Water (litres)	-5.121(0.006)***	624.562(0.953)	0.004(0.512)
Birds at initial production (number)	6.051(0.000)***	-151.864(0.794)	0.033(0.041)**
R <sup>2</sup> value	0.778	0.655	0.663
Adjusted R <sup>2</sup> value	0.720	0.621	0.631
F-value	18.441	19.488	20.268

Source: Computed from field survey data, 2021

\*, \*\*, \*\*\* representing 10%, 5%, and 1% level of statistical significance respectively

Figures in brackets are P-values

**Table 3: Types of Management Practices Adopted in Quail Production**

Management Practices	Frequency (*)	Percentage
Provision of clean water daily	40	100.0
Keeping pen floor dry	38	95.0
Keeping the quail from other birds, rodents and vermin's	39	97.5
Removal of dead birds immediately and proper disposal technique	40	100.0
Isolation of sick birds	36	90.0
Consulting of veterinarian for any serious disease	32	80.0
Provision of high quality feeds	40	100.0
Provision of adequate light	38	92.5
Provision of warmth to the newly hatched chicks	30	75.0

Source: Field Survey, 2021

(\*) = Multiple responses

**Table 4: Constraints militating against Quail Production among farmers in the study area**

S/N	Constraints	Very Serious	Serious	Not Serious	Mean Score
1.	Inadequate capital	31	9	0	2.78
2.	High cost of feed	29	10	1	2.72
3.	High cost of equipment	28	10	2	2.70
4.	High cost of labour	26	12	2	2.63
5.	High cost of drugs and vaccine	26	12	2	2.60
6.	Poor marketing of products	22	16	2	2.50
7.	Disease and pest problem	20	16	4	2.40
8.	Lack of technical know how	18	16	6	2.30
9.	Lack of contact with extension	15	18	7	2.20
10.	Lack of storage facilities	8	12	20	1.70
11.	High cost of water	10	7	23	1.68

Source: Field Survey, 2021