



UDC 332; DOI 10.18551/rjoas.2022-08.22

**EFFECT OF COVID-19 PANDEMIC ON EGG PRODUCTION AND INCOME
OF THE MARKETERS AMONG POULTRY FARMERS IN IDO LOCAL GOVERNMENT
AREA OF OYO STATE, NIGERIA**

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ABSTRACT

Coronavirus has a significant impact on both the poultry industry and individual households. The pandemic's rapid spread has a significant impact on the country, leading to a total lockdown. As a result, the study focused on the effect of the COVID-19 pandemic on egg production and income of marketers among poultry farmers in Ido Local Government, Ibadan, Oyo State, Nigeria. A total of 120 questionnaires were distributed. The respondents were chosen using a multi-stage randomization technique. The descriptive, budgetary technique was used to analyze the socioeconomic characteristics of the respondents, the effects of the COVID-19 pandemic on egg marketing, and the challenges faced by poultry farmers in egg marketing, while the budgetary technique was used to analyze the cost and return of egg marketing in the study area. Females had the highest percentage of respondents with the highest socioeconomic characteristics, according to the findings (80.8 %). The majority of respondents (96.8%) were between the ages of 31 and 60, and the vast majority was married (94.2%). It was also revealed that the majority of poultry farmers (92.5%) had formal education and that the majority of them (67.5%) practiced Christianity. According to the budgetary analysis, the average variable cost incurred by the farmers polled was 33764.85. It also revealed that the total fixed cost was 388392.98 and the total production cost was 422157.83. The profitability index was 0.38, indicating that poultry egg farmers in the study area earned N0.38 for each naira invested in production. The presence of COVID 19 was statistically significant in determining the level of income of poultry farmers. High input costs, product marketing, a lack of storage facilities, disease outbreaks, insufficient feed formulation ingredients, a lack of extension services, and movement restrictions were some of the challenges faced by poultry farmers and egg marketers in Ido Local Government. To keep poultry production afloat during and after the COVID-19 pandemic, the government should provide expanded income support to affected farms, as well as tax deferment or waiver, and lower interest rates.

KEY WORDS

COVID 19, pandemic, egg production, income, marketers.

Coronaviruses are a type of virus that causes respiratory and intestinal illnesses in humans and animals (Cui et al, 2019). They typically cause mild colds in people, but the emergence of the severe acute respiratory syndrome (SARS) epidemic in China in 2002–2003 and the Middle East respiratory syndrome (MERS) on the Arabian Peninsula in 2012



demonstrate that they can also cause severe disease. Coronaviruses are a type of virus. There are numerous types, some of which cause disease. SARS-CoV-2, a coronavirus discovered in 2019, has caused a respiratory pandemic known as COVID-19.

The world has been battling another coronavirus since December 2019. The virus causing the current outbreak of coronavirus disease (COVID-19) is SARS-CoV-2, which was discovered in Wuhan, China, after reports of serious pneumonia (Wu et al, 2020; Zhou et al, 2020).

Coronaviridae has two subfamilies. Coronavirinae is made up of four genera: Alpha and Beta coronavirus primarily infect mammals, Gamma coronavirus primarily infects birds, and Delta coronavirus primarily infects both mammals and birds (Phan et al., 2018; Attia et al., 2021). Torovirinae is divided into two genera: Torovirus, which originated in mammals, and Bafinivirus, which was isolated from fish (Tokarz et al. 2015). The first confirmed case was announced on February 27, 2020, when an Italian citizen in Lagos tested positive for the virus (Maclean et. al 2020, Adepoju, 2020).

Poultry producers have been affected in such a way that they must continue to work during the COVID-19 pandemic. As a result, their work environments in the poultry house and zones, where they must remain near coworkers and directors, may significantly increase their potential exposure risk to COVID-19. Furthermore, workers in poultry houses may become infected through respiratory droplets in the air and/or by touching dirty surfaces or poultry equipment such as feeders, drinking troughs, and pens (CDC 2019). COVID-19 infection causes a systemic disease in livestock and is spread via airborne/droplets/aerosol. COVID-19 has had an indirect impact on humans, animal production, and agricultural conditions worldwide (Sharun et al. 2021). There have been rumors about the potential involvement of eggs and chicken meat in the spread of COVID-19, which resulted in a dramatic drop in demand for poultry goods beginning in February 2020, just before the lockdown was declared, and culminating in the deterioration of poultry economics due to working capital erosion. From small farmers to large integrators, all aspects of poultry processing were severely impacted, far worse than the Avian influenza outbreak of 2006 (Das and Samanta 2021). Furthermore, a high prevalence of nasal (51.1%) and asthmatic (42.5%) symptoms was observed in poultry keepers, which may increase the susceptibility of works to COVID-19 (Viegas et al. 2013; Arcangeli et al. 2020; Clarke et al. 2021). Recent evidence suggests that COVID-19 is common in patients with chronic diseases and in poultry birds with respiratory diseases (Hafez and Attia, 2020). Significant efforts have been made in poultry to limit the avian infectious bronchitis virus (IBV). Egg prices have risen dramatically during the lockdown as consumers began to change their habits and behaviours. Consumers had stocked up on eggs in preparation for possible quarantines. Even so, as lockdowns were implemented and people were forced to stay at home, actual consumption increased. People no longer eat out, so demand for eggs is shifting from the foodservice sector to the retail channel, as consumers cook more meals at home (ANCO, 2020). Egg consumption has also increased to replace more expensive protein forms in households experiencing income declines due to COVID-19-related job losses.

METHODS OF RESEARCH

According to the 2006 population census, the total population of people in the local government was 103,261. It has a land area of 986 square kilometers. Ido local government was formed in May 1986, with its headquarters in Ido, from the former Akinyele local government. It shares borders with Iseyin and Afijo local governments to the west, Odeda local government Area to the west, and Odeda local government Area in Ogun State, Nigeria to the south. The Ido local council previously had six wards, which were increased to ten for easier franchise exercise. Apata, Omi-Adio, Ijokodo, Ido, Akufo, and Bakatari are among the major towns within the local government area, as are 612 villages. They are predominantly Yoruba, with people from other tribes from various parts of the country and from outside the country. The primary occupation of the people in the area is the cultivation of various forest edible products. The land is suitable for a wide variety of edible fruits. The average



temperature is 320 degrees Celsius, the relative humidity can reach 92 percent, and the total annual rainfall is around 1250mm. The area is located within the country's forest belt, particularly in the tropical rain forest.

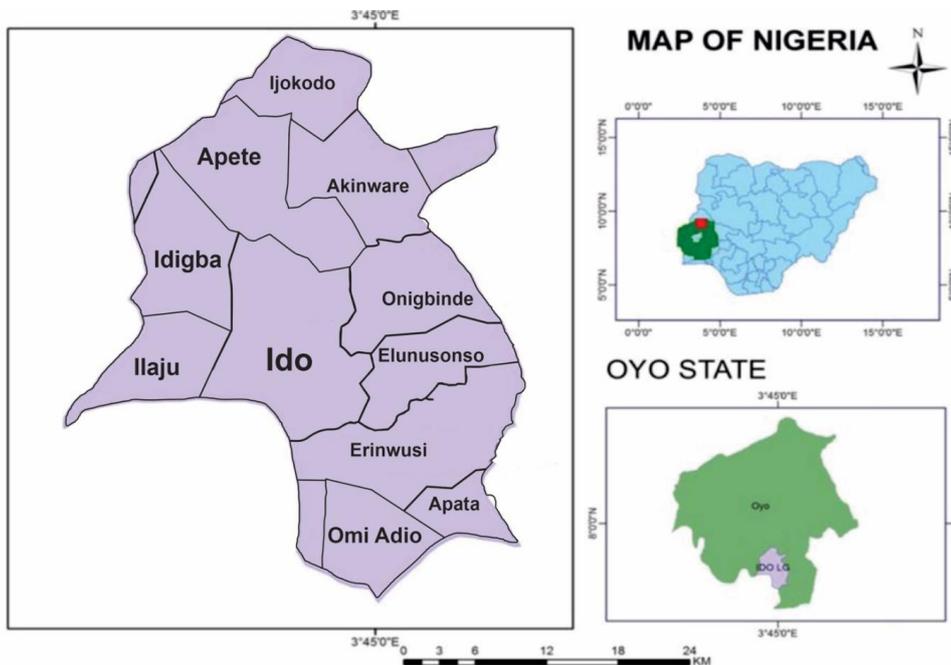


Figure 1 – Map of the Study Area

This study's population comprised of poultry farmers in Ido Local Government Area, Ibadan, and total of 120 questionnaires were distributed. The quantitative method was used to obtain data from primary sources. The structured questionnaire was used to elicit information from respondents on issues that are bothering the study's set of objectives. The respondents for the study were chosen using a multi-stage random technique. The first stage was the deliberate selection of poultry egg farmers in Ido local government, Oyo state. The second stage involved gathering a list of registered poultry egg farmers from Ido local government in Oyo state. The third stage involved using a simple random technique to select 120 registered poultry farmers.

The data collected was analyzed using descriptive and inferential statistics. Budgetary analysis was used to assess the cost and return of egg marketing in the study area. This analysis includes Net Farm Income (NFI) and a profitability index:

$$\begin{aligned} \text{£}n_i &= 1 \text{ P}_i \text{ Y}_i - \text{£}m_j - 1 \text{ P}_{x_j} \text{ X}_j \\ \text{£}k_k &= 1 \text{ FK} \end{aligned}$$

Where: NFI = Net Farm Income (per 100 birds); Y_i = Output (in Crates per 100 birds); P_i = Unit price of output (#/Crate); X_j = Variable input quantity per 100 birds (where $j = 1, 2, 3, \dots, m$); P_{x_i} = price/unit of variable input (#); FK = Cost of fixed inputs (where $K=1, 2, 3, \dots, k$ fixed inputs); £ = Summation sign.

The production function was used to determine the effect of COVID on poultry profitability. The implicit forms of the production function estimated for the sampled farms are shown in the equation below:

$$Y = (X_1 + X_2 + X_3 + X_4 + X_5 + X_6)$$

Where: Y is the output value (N); X_1 = flock size (No); X_2 = Maintenance cost (N); X_3 = Feed quantity (kg); X_4 = Total number of workers (No); X_5 = COVID 19 Presence (Dummy if present=1, otherwise=0); X_6 = other operating costs (N).



RESULTS AND DISCUSSION

The socioeconomic characteristics of poultry egg farmers were revealed in table 1. In terms of age, evidence shows that the majority (40.8 percent) of the sampled poultry farmers are between the ages of 41 and 50. As many as 8.3 percent of the farmers were over the age of 30, while youth (30 years or younger) made up a smaller proportion (4.2 percent). This finding is consistent with the findings of Ekunmeet al., (2008) and Orewa and Izeke (2012), who stated that small-scale farmers in Nigeria were ageing at a rate of 53 and 51 years, respectively. The findings revealed that 80.8 percent of the poultry farmers were females: there were more female poultry egg farmers than males in the study area. This could be because females did not own land due to the land tenure system.

Table 1 – Distribution of Respondents according to their socioeconomic characteristics in the study

Variables	Frequency	Percentage
Age		
Below 30years	5	4.2
31-40years	30	25.0
41-50years	49	40.8
51-60years	26	21.7
Above 60years	10	8.3
Total	120	100
Sex		
Female	97	80.8
Male	23	19.2
Total	120	100
Marital status		
Single	07	5.8
Married	113	94.2
Total	120	100
Educational level		
No formal education	9	7.5
Primary education	43	35.8
Secondary education	22	18.3
Tertiary education	46	38.4
Total	120	100
Religion		
Christian	81	67.5
Islam	34	28.3
Traditionalist	05	4.2
Total	120	100
Family size		
1-3	08	2.5
4-6	71	59.2
7-9	29	24.2
10-12	13	10.8
Total	120	100
Years of experience		
Below 5years	01	0.8
5-10years	52	43.3
11-15years	57	47.5
16-20years	10	8.3
Total	120	100

Source: Field survey, 2021.

This result contradicted the findings of Nmadu et al. (2012), who found that the vast majority of respondents (92%) were male small-scale farmers in Niger State. Production, particularly in farming practices, is generally tedious and energy demanding, and as a result is often referred to as a man's job, leaving women to handle processing and, in some cases, marketing and sales. The marital status distribution of the respondents reveals that the majority of the respondents (94.2 percent) were married, as expected. This compares



favourably with Simpa's (2014) finding of 70.6 percent for married root crop farmers in his study area of Owan East, Edo State. By implication, the farmers were married and had sufficient family labour, which offset the cost of family labour and thus increased productivity. The education level of the respondents reveals that the majority (92.5 percent) of the respondents have some formal education, primarily at the primary and/or secondary level; an appreciable level of illiteracy exists among the respondents. The respondents' high literacy level would allow them to understand and implement modern farm practices, increasing productivity and profitability. This is consistent with the findings of Ikheola and Inedia (2005), who discovered a high literacy rate of approximately 85 percent among poultry farm owners in Edo State. The religious distribution of the respondents reveals that 67.5 percent practiced Christianity as a religion, 28.3 percent were Muslims, and 4.2 were traditionalists. The respondents' total household size includes the head of the household, wives, children, and all other dependants living in the house. Household size and composition are important factors to consider in poultry farmer analyses, particularly because they determine the availability of labour to household farm economic pursuits. It was discovered that a typical poultry egg farmer in the study area has 4-6 members. This demonstrates that the majority of farmers had relatively small household sizes, which may be beneficial economically in terms of household welfare because there would be less pressure on farmers' output and, consequently, income. This vindicates Orewa and Izeke (2011), Anyanwu (2013).

Farming experience (years) is expected to be crucial in agricultural practice, decision making, and risk management on the farm. An experienced farmer is expected to have a better understanding of his production environment than someone who is new to the practice. According to the distribution of poultry egg farmers, farmers with 11-15 years of poultry farming experience constitute 47.05 percent of the respondents, 43.3 percent represent those with 5-10 years of experience, and 8.3 percent represent those with 16 – 20 years of experience. This is consistent with Nmadu and Simpa (2014) and Musa et al., (2011), who had 89.4 percent and 78.4 percent for farming experience of more than ten years, respectively. The many years of farming experience demonstrates that the farmers are relatively experienced and have some level of specialization, which would aid in cost reduction and increased efficiency.

Table 2 shows the respondents' perceptions of the effects of the COVID 19 pandemic on egg production. It was discovered that all of the factors had mean scores ranging from 2.94 to 3.29, with an average MS of 3.00. Statements with a mean less than 3.0 are considered to have no effect on egg production in the study area. According to the findings, the COVID 19 pandemic resulted in high chick prices (mean=3.17), an increase in feed prices (mean=3.18), high cost of feed ingredients leading to the closure of some farms (mean=3.23), high cost of feeding ingredients leading to poor egg quality production (mean=3.29), and high cost of feed ingredients reducing the amount of feed given to poultry birds (mean=3.26). According to this result, the respondents strongly agree/agree that the COVID 19 pandemic had a negative impact on egg production.

Table 2 – Perceived Effects of COVID 19 Pandemic on Marketing of Eggs

STATEMENTS	SA		A		D		SD		Mean
	Frq	(%)	Frq	(%)	Frq	(%)	Frq	(%)	
High price of chicks.	37	(30.8)	66	(55.0)	17	(14.2)	-	(-)	3.17
Increase in price of feed	40	(33.3)	63	(52.5)	16	(13.3)	1	(0.8)	3.18
High cost of feed ingredients led to closure of some farms	40	(33.3)	72	(60.0)	4	(3.3)	4	(3.3)	3.23
High cost of feeding ingredients led to production poor egg quality	46	(38.3)	64	(53.3)	9	(7.5)	1	(0.8)	3.29
Disease outbreak			3	(2.5)	112	(93.3)	5	(4.2)	1.98
High cost of feed ingredients reduce the amount of feed given to the poultry bird	35	(29.2)	82	(68.3)	2	(1.7)	1	(0.8)	3.26
High cost of feed ingredients led to shortage of egg supply in the market	5	(4.2)	103	(85.8)	12	(10.0)			2.94
GRAND MEAN									3.00

Source: Sample survey, 2021.

SA: Strongly Agree, A: Agree, SD: Strongly Disagree, D: Disagree.



The budgetary analysis of an egg poultry farming enterprise in the study area is depicted in table 3 above. This was deemed necessary in order to determine the business's profitability.

The net farm income was calculated using current market input and output prices. The analysis revealed that feed accounted for approximately (1.68 percent) of total production costs, labour cost N5900.0, and bird cost N196.87 (0.05 percent). The average variable cost incurred by the farmers surveyed was N 33764.85. Thus, the total fixed cost was N388392.98, and the total production cost was N422157.83. The estimated annual net farm income was N 335430.50, which is the difference between total revenue and total cost of production. The profitability index was 0.38, according to the results. This means that in the study area, poultry egg farmers earned N 0.38 for every naira invested in production.

Table 3 – The Budgetary Analysis of poultry egg farming enterprise

Inputs	Minimum(#)	Maximum(#)	(#)	% Total cost
Cost of birds	160.00	220.00	196.87	0.05
Cost of transportation	2,000.00	2800.00	2,485.05	0.59
Cost of labour	4500.00	7,200.00	5,900.00	1.40
Water cost	2080.00	2,500.00	2,492.29	0.59
Medicine	2,000.00	42,000.00	4,788.30	1.13
Vaccination	3,400.00	35,100.00	6,879.45	1.63
Veterinary service	1,500.00	3,500.00	3,455.59	0.82
Lantern	130.00	500.00	493.21	0.12
Cost of feed	6,050.00	7,500.00	7,074.08	1.68
Total Variable Cost	26,153.00	76,380.00	33764.85	8.0
Cost of pen	17,000.00	277,500.00	193,672.48	45.88
Cost of cage	11,500.00	370,000.00	178,508.26	42.28
Cost of feeder	2,850.00	33,150.00	7,925.28	1.88
Cost of drinker	2,960.00	38,110.00	8,286.97	1.96
Total Fixed Cost	89,060.00	652,660.00	388,392.98	92.0
Total Cost	126,970.00	687,785.00	422,157.83	
Total revenue	102,400.00	2,100,000.00	693,533.21	
Gross Margin	14,485.00	1,012,090.00	313,001.75	
Net Farm Income	30,100.00	2,010,940.00	335,430.50	
Profitability Index			0.38	
Rate of return on investment			38.84	

Source: Field Survey, 2021.

The effect of COVID 19 on total income of poultry farmers was studied using regression analysis. The estimated parameters and statistical test results from the analysis are shown in the table below. The adjusted R² value was 0.731. This means that the variables (X1-X6) included in the model account for approximately 73.1 percent of the variation in (Y), while the remaining 39.4 percent is due to the absence of other explanatory variables in the model. The F-value is positive and statistically significant at 0.10, indicating that the model variables adequately explain net income in the survey area. Only flock size, total labour, and the presence of COVID 19 were statistically significant in determining the level of income from poultry production in the survey area. This is due to the fact that increasing flock size leads to increased output, which leads to an increase in total revenue. In determining the profit level of poultry egg production in the survey area, the coefficients of flock size and labour number were statistically significant. This suggests that there is a positive relationship between flock size, total labour, and total revenue from poultry-egg production. This implies that an increase in poultry-egg farmer flock size and total labour will almost certainly lead to an increase in farmer revenue in the study area. In determining the profit level of poultry egg production in the survey area, the presence of COVID 19 was statistically significant but negative. This implies that the presence of COVID 19 has an inverse relationship with total revenue from poultry-egg production. This implies that the lower the revenue of poultry farmers in the study area, the more persistent COVID 19.



Table 5 – Regression Analysis Result of effect of COVID 19 on total income of poultry farmers

Variables	Coefficients	t-value
(Constant)		13.113
Flock size	0.227**	2.444
Cost of maintenance	-0.051	-0.473
Population of bird	-0.049	-0.417
Total quantity of feed	-0.132	-1.404
Total number of labour	0.126**	2.335
Presence of COVID 19	0.295***	-4.240
Other operating expenses	0.262	1.286
F-Value	1.732	
R Square	0.899	
Adjusted R Square	0.731	

Source: Field survey 2021; 1% Significance level= ***, 5% Significance level= ** and 10% Significance level= *.

Table 5 – Challenges Faced by Poultry Farmers in Egg Production

Statements	VS		S		NS		Mean
	Frq	(%)	Frq	(%)	Frq	(%)	
High cost of inputs	11	(9.2)	100	(83.3)	9	(7.5)	2.02
Marketing of products	15	(12.5)	102	(85.0)	3	(2.5)	2.10
Lack of storage facilities	11	(9.2)	7	(5.8)	102	(85.0)	1.24
Lack of extension services	114	(95.0)	4	(3.3)	2	(1.7)	2.93
Adverse weather condition	9	(7.5)	7	(5.8)	104	(86.7)	1.21
Disease outbreak	10	(8.3)	4	(3.3)	106	(88.3)	1.20
Seasonal egg glut	12	(10.0)	108	(90.0)	-	(-)	2.10
Unavailability of raw materials	11	(9.2)	106	(88.3)	3	(2.5)	2.07
Movement Restrictions	13	(10.8)	107	(89.2)	-	(-)	2.11
Inadequate feed formulation ingredients	18	(15.0)	97	(80.8)	5	(4.2)	2.11
GRAND MEAN							1.91

SOURCE: Sample survey, 2021.

This Table 5 displays the responses of respondents to the challenges that poultry farmers face in egg production in the study area. It was discovered that all of the factors have mean scores within the range MS > 1.20 2.93, with an average MS of 1.91. The statement whose mean is less than the average mean of 1.91 is considered to pose no challenge to egg production in the study area. The challenges are high input costs (mean=2.02), product marketing (mean=2.10), a lack of extension services (mean=2.93), seasonal egg glut (mean=2.10), raw material scarcity (mean=2.07), movement restrictions (mean =2.11), and insufficient feed formulation ingredients (mean =2.11).

CONCLUSION AND RECOMMENDATIONS

The purpose of this research was to determine the impact of the COVID-19 pandemic on egg production and marketing in the Ido local government. The study found that 80.8% S of respondents were female, indicating that there were more females than males in the poultry egg business in the study area. The study also revealed that the poultry egg farmers face challenges such as high input costs, seasonal egg gluts, a lack of extension services, movement restrictions, product marketing, a lack of storage facilities, and inadequate feed formulation ingredients. The profitability index was 0.38, according to the findings. This means that poultry egg farmers in the study area earned N 0.38 for every naira invested in production.

The government should provide additional income assistance to affected farms. Tax deferral or waiver, as well as lower interest rates, could be implemented by appropriate policymakers to keep poultry production afloat during and after the COVID-19 pandemic.



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