THE EFFECT OF WORKING CAPITAL ON PROFITABILITY OF POULTRY EGG ENTERPRISE IN OSUN STATE, NIGERIA

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Abstract: *This study investigated the effect of working capital on the profitability of poultry egg enterprise. Primary data were collected from 180 poultry egg farmers using two-stage sampling technique. Data were collected on the socio-economic characteristics such as age, gender, educational qualification, farming experience and flock size owned, quantities of inputs and outputs. Descriptive statistics, farm budgetary technique and ordinary least square model were used to analyze the data collected. The results from descriptive statistics show mean values of 42 years, 9 years and 5 persons for age, years of experience and household size, respectively. Majority of poultry egg farmers (52.2%) used their personal savings to fund their businesses while, some had access to loan from co-operative societies (37.2%), from SEAP microfinance (6.7%) and from banks (3.9%). Poultry egg producers invested their working capital on feeds (64.8%), rearing of poultry birds from day old chicks to point of lay (14.8%), account receivables (13.6%), drugs & vaccines (2.4%) and variable overheads (4.4%). A total cost of ₦5,494,927.04k was incurred by the poultry egg producers. Cost of feed accounted for 71.89% of the total cost of production. A total revenue of ₦9,388,555.60k and the net returns of ₦3,893,628.56k were realized. The net farm income per bird from the enterprise was ₦1,698.05k while the gross margin per bird was ₦1,795.32. The ordinary least squares regression estimates revealed that inventory, account receivable, operating cycle and flock size have significant effect on the profitability of poultry egg enterprises. The study concluded that poultry egg enterprise is profitable and working capital has a significant effect on the profitability of poultry egg enterprise. In light of the findings, the study recommended the expansion of the poultry flock size as well as reduction in the number of days of inventories, account receivables and operating cycle in order to increase the profitability of poultry egg enterprise.*

Keywords: *Working capital, Profitability, Poultry egg enterprise, Osun State*

INTRODUCTION

Poultry is the largest and the most reared livestock in Nigeria either for subsistence or commercial purpose (Umunna et al., 2012). The importance of the poultry enterprises lies chiefly in the raising of domesticated birds such as fowls, turkeys, duck, geese and guinea fowl purposely for meat, egg and other products (Umunna et al., 2012). Excess released from such products is exported for foreign exchange, generating employment either directly or indirectly and revenue (Adebayo and Adeola, 2005). The poultry egg enterprise, apart from providing employment and livelihood to thousands of Nigerians, also provide high quality and nutritious food. However, the usefulness of any food for body building depends on the amount of protein, it contains. Whereas, the nutritional status of many Nigerians is characterized by low calorie and protein intakes. Furthermore, Nigerians' greatest problem is inadequate animal protein in their diets (Iyangbe and Orewa, 2009). Adepoju (2008) reported that the average per capita protein intake in Nigeria was 51.7g of which only 6.8g came from animal sources. However, poultry eggs play a valuable role in bridging the protein gap (Aromolaran et al., 2013). Afolami et al. (2011) noted that, in comparison with other livestock products, poultry eggs are considered to be more palatable, having lower level of cholesterol and high protein value with excellent quality. Eggs out-rank other livestock products such as chicken, beef and mutton in terms of protein quality; one egg gives about 6g of protein and egg-white protein has a biological value of 100, the highest biological value of any single protein (Food and Agriculture Organization, 2005; Layman and Rodriguez, 2009). Egg shell is also a good source of calcium. This asserts the fact that eggs play a significant role in solving the problems of food insecurity and malnutrition in the country (Achoja, 2012). Tijani et al. (2006) reported a number of other uses of eggs, apart from nutritional benefits; they are used in confectionary bakery products, ice creams, cosmetics, among others.

In line with the increase in the awareness of eggs' roles in the human body, population, education level, and the purchasing power of individuals, there is growing demand for eggs (Candra et al., 2015). In recent years, the demand for eggs has increased significantly (Heise et al., 2015). Whereas, the production in the country is still very insufficient, as reflected by the wide interval between supply and demand of the products (Ohajinya et al., 2013). Local demand for poultry eggs in Nigeria stands at 1.5 million tonnes, while the supply capacity is between 700,000 and 1 million tonnes. This trend is very likely to continue over the next few decades. Exploring into this opportunity, this will no doubt reduce some measure of economic burden from the large unemployed population. This is ascribed to the fact that egg production is an important economic enterprise offering more rapid and efficient returns than many other agricultural productions. Economic return that is, profitability is one of the main determinants of any agricultural production, egg production inclusive (Hossen, 2010). Profitability connotes ability to make profit from all business activities of an organization, company, firm, or an enterprise. It shows how efficiently the management is, in combining market inputs at his disposal. Usually, average cost per unit of production decreases as the economic scale increases. Economies of scale result from spreading fixed costs over a large number of units of production. Fixed cost per unit declines as the number of units produced increases which will result in total cost per unit declining. However, high cost of inputs is a major challenge in poultry industry because feeds purchase, for example consumed as much as 70% of the cost of production which has led to a large reduction in the number of poultry egg enterprise especially the small-scale ones who could not withstand production of eggs at high cost (Adebiyi, 2000; Ashagidigbi et al., 2012).

In light of the above, one of the major factors that has forced most poultry egg enterprise especially, small-scale poultry farms to close down their operation is low capital base. Akanni (2007) and Ovwigho et al. (2009) stated that small scale poultry farmers complain of limited access to funds, which is often linked with their low level of farm income and insufficient collateral securities, for the procurement of poultry equipment and materials which include feeds, drugs and vaccines, cages and feed troughs, and also funds needed to pay workers' salaries. Therefore, in Nigeria, poultry egg enterprise requires additional financing apart from owned investment fund (Akpan et al., 2013). Personal savings and cooperative societies have been the major source of finance in poultry egg enterprise which is usually small and not sufficient to enlarge production (Adetiloye, 2012). Nevertheless, working capital could be an important instrument for increasing agricultural production. Working capital is the portion of an enterprise's total capital which is employed in short term operations i.e., current assets. A typical list of these assets in order of liquidity includes cash in hand and at bank, short term investments, payment in advance, account receivables, raw materials inventory, inventory of goods in process and finished goods inventory. The management of all these current assets assumes greater importance because the total sum of investment in current assets forms over half of an enterprise's total assets and it could have a significant effect on firm's profitability and liquidity. Profitability and liquidity, the two desired goals of financial management are directly affected by working capital. While excess working capital can have adverse effect on profitability, inadequate working capital can hold up production and sales of well managed firms. Working capital is a very important asset for production firms whose assets are mostly composed of current assets. It constitutes a major source of capital for small and medium sized firms because they have limited access to external finance (Akinlo, 2012). Working capital assists small firms to fund its activities from spontaneous financing in the form of trade credit which is a cheap source of finance and ensure profitability of the business.

However, most researches on working capital have focused on large firms in the developed economies (Akinlo, 2012). Whereas, the importance of working capital is critical when it refers to small and medium firms in developing economies. These firms are faced with many problems including low investment, low sales and lack of resources. They lack the opportunity of getting benefits of financial market to source for finance. Financial institutions are not willing to give credit to small firms as they are considered to be very risky and not profitable. In solving the problems identified above, firms in developing countries have to rely on proper management of their working capital. Unfortunately, despite the importance of working capital for firms especially for developing countries like Nigeria, studies have not been focused on the subject matter. On the other hand, many studies (Adepoju, 2008; Olasunkanmi 2008; Taru et al., 2010; Ike and Ugwumba, 2011; Tanko and Aji, 2011; Tijjani, et al., 2012; Mahama et al., 2013; Olufemi and Adeolu; 2013; Ohajianya et al., 2013; Anang et al., 2013; Emokaro and Emokpae, 2014; Tanko and Aji, 2014; Tanko et al., 2014; Kehinde, 2021) on poultry egg enterprise have largely focused on economic analysis, efficiency of resource-use and many other related studies.

Yet, no known study has been published on the effect of working capital on profitability of poultry egg enterprise in Nigeria. The dearth of literature on this subject matter creates a big gap that needs to be filled. It is expedient to inquire into the relationship between working capital and profitability of poultry egg enterprise, taking cognizance of the firm's characteristics of high investment in variable inputs (feeds) and limited access to finance. Consequently, this study analyzes the effect of working capital on profitability of poultry enterprise in Osun State, Nigeria. Specifically, it describes the socio-economic characteristics of poultry egg producers; identifies the sources and uses of working capital in poultry egg enterprises; and analyses the effect of working capital on profitability of poultry enterprises. This study will no doubt contribute significantly to knowledge in the area of working capital management and will shed light on the relationship between working capital and profitability in poultry egg enterprise. This study will be useful for formulating policies and promoting investment leading to an increase in egg production and thereby bridging the gap between the demand and supply of eggs in the province. Information from this study will also be useful to farmers or micro entrepreneurs to establish and/or manage their poultry egg enterprises more

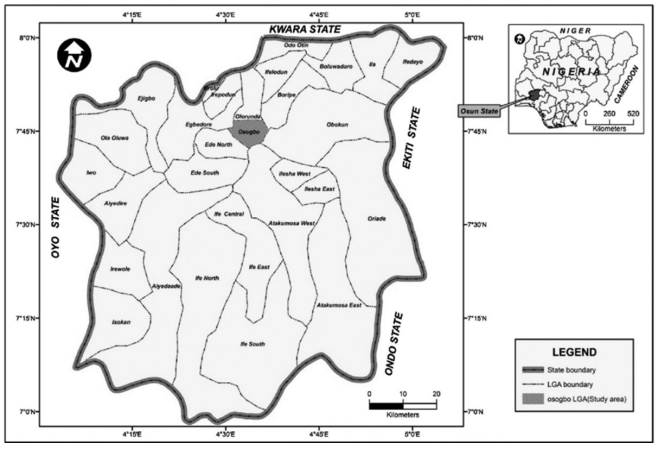
efficiently and may lead to earning higher profits. The rest of the paper is organized as follows. Next section describes the data and the methods. Section three presents and discusses the empirical findings, while the last section concludes.

MATERIALS AND METHODS

Area of the study

The study was conducted in Osun State. Osun State is an inland State in South Western Nigeria with State capital in Osogbo. It is bounded in the north by Kwara State, in the north east by Ekiti State, south east by Ondo State, in the South by Ogun State and in the west by Oyo State. Osun State has three agricultural zones namely; Ife-Ijesha zone (Rain Forest), Iwo zone (Savanna) and Osogbo zone (Derived savanna). There are thirty Local Governments Areas in Osun State. Osun State has area of 9,251km2, population of 3,416,959 (2006 census) and population density of 379/km2. The primary occupation of people in Osun state is farming. However, poultry production dominates the livestock production in the area.

Figure 1: Map of Osun State



Sampling procedure

A two-stage sampling technique was used for the study. At the first stage, six cities from the three agricultural zones in the State were purposively selected based on the predominance of poultry farmers in the cities. The cities are Ile-Ife, Ilesha, Osogbo, Iwo, Ila and Ejigbo. A list of poultry egg farmers in the six cities was obtained from Poultry Association of Nigeria (PAN) Osun State chapter. The second stage involved simple random selection of thirty poultry egg farmers from each of the six cities. A total of 180 poultry egg farmers were selected. Primary data were collected using a pre-tested and well-structured questionnaire. Data were collected on socio-economic characteristics of the respondents such as age, gender, educational qualification, farming experience and flock size; quantities of inputs and outputs, sources of working capital, account receivables and accounts payable.

Table 1: Sampling procedure for the study

State	Cities	Poultry egg farmers	
		Proportion used	Number of registered farmers
Osun	Ile-Ife	30	79
	Ilesha	30	78
	Osogbo	30	89
	Iwo	30	98
	Ila	30	75
	Ejigbo	30	87
Total	**6**	**180**	**506**

Analytical technique

The study employed descriptive statistics, farm budgetary technique, and ordinary least squares regression model to analyze the data collected.

Descriptive statistics

Descriptive statistics (such as frequency and percentage) was used to summarize the data. Firstly, it was used to describe the socio-economic characteristics of poultry egg producers. Secondly, it was used to identify the sources and uses of working capital in poultry egg enterprises.

Farm budgetary techniques

A farm budgetary technique was employed to estimate the profitability of poultry egg enterprises, the various types of inputs used and their costs implication using enterprise

budget analysis. The costs were divided into variable costs and fixed costs. The variable costs include the cost of labour, day old chicks, veterinary services, transport, feeding, rent charges on land and general management of birds. Fixed costs include depreciation on fixed assets, (e.g. building, battery cage, water tank, motor vehicle, etc.); this was charged using straight- line method.

Gross Margin,

$$GM = \sum p_i q_i - \sum r_i x_i \quad (1)$$

Where;
pi = average price of eggs and spent layers (₦)
qi = average quantity of eggs sold and spent layers
ri = average price of variable inputs (₦)
xi = average quantity of inputs used
Subsequently, a net return was obtained from gross margin.
Net returns = GM- TFC
Where, TFC= Total Fixed cost
The profitability ratios employed to measure the economic performance of the poultry egg enterprise are: Benefit-Cost ratio; Rate of return on investment; Operating expenses ratio and Profitability index.
Benefit-Cost ratio (BCR) is measured as:
BCR= Total Revenue/Total Cost
The Rate of return on investment (ROI) is measured as:
ROI= Net Farm Income/Total Cost
The Operating Expenses ratio (OER) is measured as:
OER= Total Operating Expenses (Total Variable Cost)/ Total Revenue.
The Profitability index (PI) is measured as:
PI= Net Farm Income/Total Revenue.

Ordinary least squares regression model

The effect of working capital on profitability of poultry egg enterprises was determined using ordinary least squares regression model. Profitability is directly related to exogenous variables that describe the social and economic environments in which enterprises make decisions. OLS models the exogenous relationship between working capital and profitability. The model was chosen based on the premise that the error term (ei) is normally distributed, and as a result, its estimator is normally distributed, linear, and unbiased.

The model was implicitly specified thus:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \varepsilon_i \quad (2)$$

Where;
Y = Profitability (₦)
The explanatory variables are: X1= Inventory Turnover Period (inventories/cost of sales multiplied by 365days); X2= Account Receivables period (Account receivables/sales multiplied by 365days); X3= Account payable period (Account payables/cost of sales multiplied by 365days); X4= Operating cycle (Inventory Turnover Period +Account receivable period); X5=Flock size (Number of poultry birds); ei= Error term.

In the model, different functional forms such as simple linear, semi-logarithmic and double-logarithmic were explored. However, simple linear functional form was selected as the lead equation based on econometric criteria (T-test, F-statistics, and R2), number of significant variables and the a *priori* expectation of the signs of the coefficients.

Simple Linear form

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \varepsilon_i \quad (3)$$

Semi-logarithmic form

$$Y = \text{Log}\beta_0 + \beta_1 \text{Log}X_1 + \beta_2 \text{Log}X_2 + \beta_3 \text{Log}X_3 + \beta_4 \text{Log}X_4 + \beta_5 \text{Log}X_5 + \varepsilon_i \quad (4)$$

Double-logarithmic form

$$\text{Log}Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \varepsilon_i \quad (5)$$

Description of variables

Profitability is measured as net farm income. Net Farm Income (NFI) is the difference between total revenue and total cost. It is derived from budgetary analysis. The number of days of inventory is calculated as (inventory/cost of sales) x365. This variable reflects the average number of days of stock held by the poultry egg enterprise. Longer storage time represents a greater investment in inventory for a particular level of operations. Inventory turnover period is expected to have a negative relationship with profitability (Akinlo, 2012; Deloof, 2003). Profitability declines as the number of days of inventory increases. The number of days account receivable is calculated as (account receivable/Sales) x365. This variable represents the average number of days, a poultry egg enterprise takes to collect payment from its customers. The higher the value, the higher the investment in account receivable. Account receivable period is expected to have negative relationship with profitability (Pandey 2004, Adeniji, 2011; Akinlo, 2012). Profitability declines as the number of days of account receivable increases. The number of days account payable reflect the average time, it takes firms to pay its suppliers. This is calculated as (account payable/cost of sales) x365. The higher the value, the longer firms take to settle their payment commitments to their suppliers. This variable is calculated as the number of days account receivable plus the number of days of inventory. Accounts payable period is expected to have negative relationship with profitability. This is because the longer the number of days of account payable, profitability decreases because of the increased interest and removal of discount. The longer the operating cycle, the greater the net investment in current assets. This is measured as the mean number of laying birds per production cycle on the farm. Operating cycle is expected to have a negative relationship with profitability. The shorter the operating cycle, the higher the profitability. Flock size is expected to have a positive relationship. Larger number of birds will result in higher revenue from sales of eggs produced and spent layers which increases profitability.

Table 2: A prior expectation

Variables	Units	Expected signs
Inventory turnover period	The number of days of inventory	-
Account receivable period	The number of days of account receivable	-
Accounts payable period	The number of days of account payable	-
Operating cycle	The operating cycle	-
Flock size	The number of birds	+

RESULTS AND DISCUSSION

Socio-economic characteristicsof poultry egg producers

The socio-economic characteristics of poultry egg producers are presented in Table 3. According to Adegbite et al. (2014), age of the poultry egg producers may influence the vigour, versatility and adoption of innovations among farmers which has implication on their productivity. The mean age of the poultry egg producers is approximately 42 years. This implies that they were within the active age bracket and economically productive. These are particularly young people who could afford to venture into poultry business known to be characterized by risks such as disease, fire outbreak and burglary (Akanni, 2007; Olagunju, 2007). Furthermore, it is an indication that poultry business is attractive and poultry production will be sustained as these young farmers will remain in business for a long time (Nmadu et al., 2014). This finding agrees with the findings of Akpan et al., (2013) and Afolabi et al., (2013). Most of poultry egg farmers (86.7%) are male. This implies that in the study area, poultry egg producers are dominated by men which can be attributed to the rigorous and stressful nature of poultry enterprise, which the females might not be able to cope with. Although in some cases, the input of the proprietor is not based on gender but on co-ordination and direction. At the same time, the gender of the producers is foreseen to influence the performance of the enterprises because some of their input is managerial as well as physical. Furthermore, the dominance of males in poultry business may not be unconnected to the huge sum of money needed to start the business which is often difficult for women to raise, especially in Africa. Marital status of a farmer is important for the availability of family labour for farming activities. About 87.8% of the respondents are married. This implies that majority of poultry egg producers are married which is a strong indication that most of them are in business to assist in their family upkeep. It also has implication on the household size and amount of family labour that will be available for farm work as reported by Adegbite et al., 2014. The result also agreed with the findings of Ohajianya et al. (2013).

Household size is the total number of people living together in a house, feeding from the same pot and pulling resources to achieve the same objective. It represents human capital endowment of the farmer as it reflects potential family labour supply. Onubuogu et al., (2013) described household as people who live under one roof and who made or are subject to others making for them joint financial decisions. The average household size in the area of study is 5 persons. This implies that poultry egg producers in the study area have a large household size. Large household size reduces the cost of hired labour, encourages availability of labour and expansion of poultry egg production. The findings support the result of Esiobu et al. (2014). Farmers with formal education have a great ability to adopt new technology and make rational decisions. Majority (78.3%) of poultry egg farmers have formal education which indicates that literate farmers are involved in poultry egg production in the area of study. This could be due to the fact that success and efficiency in poultry egg production like any other livestock production enterprise, requires some level of educational attainment by the producers. Education would afford poultry egg producers the opportunity to understand and adopt modern farm practices thereby enhancing profitability. These findings agree with the results of Akanni (2007), Olagunju (2011) and Adegbite et al. (2014). Proficiency and skill acquisition usually grow with years of experience. It is therefore expected that longer years of experience afford producers better skill and knowledge of production. The average years of experience of poultry egg producers in the study area is 9 years. This suggest that majority of poultry egg producers in the area are not new in the business. Experienced farmers are likely to make better decisions to enhance productivity and income. Expectedly, the more the number of years of experience in poultry keeping, the better the ability to manage poultry business well. Cases of disease attack, fire outbreaks, poor feed quality and pilferage could be better handled by experienced poultry farmer. Also, farmers with more years of experience would be more efficient and expected to run a profitable enterprise. The findings agree with Afolabi et al. (2013).

The mean flock size is 2,293 birds. This result implies that poultry egg enterprise is dominated by medium scale farms based on the classification of Omotosho and Ladele (1988) as adopted in this work. The prevailing production systems in poultry egg production in Nigeria are cage and deep litter systems. Findings from Table 3 shows that cage system is commonly used in the study area as it has the larger percentage (80.6%). This may be due to the fact that they are easy to manage and also reduces the number of cracked eggs. The cage can be battery cage, locally fabricated cage or wood cage. Extension activities involve the dissemination of information to the poultry farmers within the State, within a short time which will help to adopt new technology and improve productivity. About 46% of the respondents are visited by the extension agents within the last production cycle. With the extension visit, poultry farmers will have access to adequate and regular information from the research institutes and solution to any developed problems. About 47% of Poultry egg farmers belong to co-operative societies. This implies that majority

of poultry egg farmers does not belong to co-operative society in the area of study. Poultry farmers should be encouraged to belong to a co-operative society to enable them benefit from membership's access to loans and non-financial benefits.

Table 3: Socio-economic characteristics of poultry egg producers

Variables	Poultry egg farmers
Male (%)	87
Age (years)	42.25(±11.46)
Married (%)	88
Household size (#)	5.03 (±2.14)
Formal education (%)	78
Years of farming experience	9.10(±7.14)
Flock Size (birds)	2293 (±596)
Cage system (%)	80.6
Extension contact (%)	46
Cooperative membership (%)	47

Source: Field Survey, 2015

The Sources and uses of Working Capital in Poultry Egg Enterprise

Table 4, shows the sources of working capital of poultry egg producers in the study area. Findings revealed that majority (52.2%) of poultry egg farmers sourced their working capital from owner's equity (personal savings). While, 37.2% from Cooperative Societies, 6.7% from Microfinance (SEAP Microfinance) and 3.9% from Banks. This finding agrees with Akanni (2007), Olagunju and Babatunde (2011) who both reported that 61% and 55% of poultry egg farmers sourced finance from their personal savings. However, internal sourcing of finance from owner's equity (personal savings) is constrained as most poultry farm operators had a weak financial base. Also, limited collateral securities made it difficult to obtain loans from banks. Additional sources of fund are therefore required for the poultry egg producers to sustainably solidify their financial base with assured increase in output level.

Table 4: Sources of working capital for poultry egg enterprise

Source	Frequency	Percentage
Personal Savings	94	52.2
Cooperative Society	67	37.2
Microfinance	12	6.7
Bank	7	3.9
Total	**180**	**100**

Source: Field Survey, 2015

Working capital in poultry egg enterprise is used to fund current assets used in poultry egg production. Working capital investments in poultry egg enterprise starts from the first day of the production cycle. Day old chicks are raised to point of lay between 18 to 20 weeks of the production cycle when the farm generates no revenue and solely rely on working capital daily. After this period, investment in feeds is most significant as the birds must be adequately fed for optimum egg production from 20 weeks to 72 weeks of the production cycle. Table 5 shows the uses of working capital by poultry egg producers in the study area. The result revealed that poultry egg producers invested their working capital on feeds (64.8%), rearing of poultry birds from day old chicks to point of lay (14.8%), account receivables (13.6%), drugs & vaccines (2.4%) and variable overheads (4.4%).

Table 5: Uses of Working capital in Poultry egg enterprise

Working capital Investment	Value (₦)	Percentage
Rearing of day-old chicks to point of lay	902,760.38	14.8
Feeds	3,950,458.62	64.8
Drugs and Vaccines	145,438.00	2.4
Variable Overheads	268,219.00	4.4
Account Receivable	825,000.00	13.6
Total	6,091,876.00	100

Source: Field Survey, 2015

Profitability of Poultry egg enterprise

The costs and returns to poultry egg enterprise is presented in Table 6. It was found that about 95.94% of the total cost of production was incurred on the variable inputs. The cost of feeds accounts for 71.89%. This agrees with Akanni (2007), Olagunju and Babatunde (2011) who affirmed that poultry egg enterprise is characterized with high investment in variable inputs and feeds having the largest proportion. This implies that a huge amount of money is spent on feeds in the business. The cost of the laying birds which was the cost of raising the birds from day old chick to point of lay accounted for 16.43% of the total cost of production. The period of raising day old chicks to point of lay usually take a period of between 18-20 weeks. The cost of medication and services accounted for 4.19% of the total cost of production. The mean value of the total variable cost and total fixed cost were ₦5,271,876.00k and ₦223,051.04k respectively while the mean value of total cost was ₦5,494,927.04k. The mean value of total revenue was ₦9,388,555.60k. Revenue from sales of eggs was 87.3% of the total revenue while the net income was ₦3,893,628.56k which was measured by subtracting total cost from total revenue. The net farm income per bird from the enterprise was ₦1,698.05k while the gross margin per bird was ₦1,795.32k. A profitability measure which also an attempt to estimate the future outcome of the enterprise in both

quantitative and financial term was carried out. Profitability index which gives a value of 0.41 indicating that from every ₦1 generated, a net income of ₦0.41 is earned. The rate of return on investment gave 0.71 which implies that from every ₦1 invested in the enterprise, a net income of ₦0.71 is realized. The operating expenses ratio which value was 0.56 shows that from every ₦1 generated from the enterprise, ₦0.56 is invested as a running cost into the business. Also, the benefit-cost ratio of 1.71 implies that from every ₦1 invested on poultry egg enterprise, ₦1.71 is realized. All these performance measures affirm that poultry egg enterprise is a profitable venture. This finding agrees with the result of Kehinde (2021).

Table 6: Profitability of Poultry Egg Enterprise

S/n	Item	Value (₦)	Percentage
1. Variable Costs:			
i	Cost of laying birds	902,760.38	16.43
ii	Feed cost	3,950,458.62	71.89
iii	Medication and services	230,438.00	4.19
iv	Casual labour	80,146.00	1.46
v	Water	45,073.00	0.82
vi	Fuel/electricity	45,000.00	0.81
vii	Repairs	18,000.00	0.33
A	Total variable cost (TVC)	5,271,876.00	95.94
2. Fixed cost			
I	Depreciation charges	80,051.04	1.45
ii	Rent	82,000.00	1.49
iii	Permanent labour	61,000.00	1.11
B	Total Fixed Cost (TFC)	223,051.04	4.06
C	Total Cost=(TVC+TFC)	5,494,927.04	
3. Revenue			
i	Sales of Eggs	8,196,209.04	87.3
ii	Sales of Spent Layers	1,192,346.56	12.7
d	Total Revenue (TR)	9,388,555.60	
e	Gross Margin =TR-TVC	4,116,679.60	
f	Net Farm Income =TR-TC	3,893,628.56	
g	Gross Margin/bird	1,795.32	
h	Net income/bird	1,698.05	
i	Benefit Cost ratio=d/c	1.71	
j	Rate of return on investme nt=f/c	0.71	
k	Operating expenses ratio=a/d	0.56	
l	Profitability index=f/d	0.41	

Source: Field Survey, 2015

The effect of working capital on profitability of poultry egg enterprise

The effect of working capital on profitability of poultry egg enterprise was analyzed using ordinary least square regression model (Table 7). The Three functional forms of the specified model which are; linear, semi-logarithmic and double-logarithmic were explored. The lead equation was chosen on the basis of correct sign of the explanatory variables, the significance of the model's coefficient and the value of the coefficient of R2. The net farm income obtained from the budgetary analysis is the dependent variable for the model. The components of Cash conversion cycle which is a measure of working capital were specified in the model to explain the effect of working capital on profitability of poultry egg enterprise. The components include inventory holding period, accounts receivable period and accounts payable period. However, data collected from the study revealed that account payables are not obtained in poultry egg enterprise hence was omitted in the regression analysis. This implies that poultry egg farmers do not have access to credit purchases. This further revealed that poultry egg farmers do not have access to the cheapest source of financing working capital (Spontaneous financing).

Results from the OLS model shows that the linear function produces the best fit. The linear function gave the highest coefficient of multiple determination (R2) and the signs of the explanatory variables agreed with the theoretical and econometric expectations. The adjusted R2 indicates how much of the dependent variable, profitability can be explained by the independent variables. The result shows that 94% of the variation in the dependent variable can be explained by the independent variables. From the Table, inventory, operating cycle and poultry flock size significantly influenced profitability of poultry egg enterprises. The number of days of inventories is negatively related to profitability of poultry egg enterprises and is significant. This implies that the lower the number of days inventories, the higher the profitability. Profitability can be increased by reducing the number of days inventories in the poultry egg enterprise. The number of days of account receivable is significant but negatively related to profitability of poultry egg enterprises. This implies that the lower the number of days account receivable, the higher the profitability. Profitability can be increased by reducing the number of days account receiv-

able in poultry egg enterprise. Operating cycle is found to be significant and negatively related to profitability. This implies that lower number of days the business converts inventory and receivables to cash, the higher the profitability. Poultry flock size is significant and positively related to profitability. This implies that the higher the flock size, the higher the profitability of the poultry egg enterprise.

Table 7. The effect of working capital on profitability of poultry egg enterprise

Variables	Linear	Semi-log	Double-log
Constant	609.980 ***(9.649)	6.422***(6.743)	3.637***(2.949)
Inventory	-46.271***(-5.971)	0.011***(-2.598)	0.933***(6.113)
Account receivable	-0.113***(-3.154)	0.087(0.100)	0.031***(4.873)
Operating cycle	-4.812***(-3.166)	-0.021***(-2.853)	-0.876***(-5.104)
Poultry flock size	0.816***(7.783)	0.384***(4.029)	0.465***(9.719)
Adjusted R-squared	0.945	0.934	0.825
F-Statistic	1039.11	852.54	211.61

*Note: ***p < .01, ** p < .05, * p < .10.*
Values in parenthesis are t-ratios.
Source: Data Analysis, 2015

CONCLUSION

This study investigated the effect of working capital on profitability of poultry egg enterprise in Osun State, Nigeria. Primary data were collected from a total of one hundred and eighty respondents using two-stage sampling technique. Data collected were analysed using descriptive statistics, farm budgetary technique and OLS model. The study revealed that majority of the poultry egg producers are male, literate, married and within the active age group. Poultry egg enterprise is profitable and majority operated on medium scale. Majority of the poultry egg farmers used their personal savings to fund their business and do not belong to co-operative society. Poultry egg producers invested their funds in feeds, rearing of day-old chicks to point of lay, account receivables, variable overheads, drugs and vaccines. Budgetary analysis revealed that variable inputs constituted over 95% of the total cost of production. Feed is identified as the highest among variable inputs. The net farm income per bird was ₦1, 698.05k which imply that poultry egg enterprise is profitable. The profitability index was ₦0.41, rate of return on investment was ₦0.71, operating expenses ratio was ₦0.56 while the benefit-cost ratio was ₦1.71. From the OLS model, inventory, account receivable, and operating cycle had significant but negative relationship with profitability of poultry egg enterprises. While flock size had significant and positive relationship with profitability of poultry egg enterprises in the study area. Based on the findings from the study, it was concluded that the components of working capital had a significant effect on the profitability of poultry egg enterprise. Based on this conclusion and observations made during the study, we recommended that poultry egg producers should reduce the number of days of inventories, operating cycle and account receivables for optimum profitability of the poultry egg enterprise. Also, poultry egg enterprises should expand their flock size to maximize profitability. Lastly, the producers should consider joining co-operative societies to enable them access fund easily.

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