Profitability Analysis of Poultry Egg Production in Bauchi Local Government Area of Bauchi State, Nigeria.

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ABSTRACT
The study, profitability analysis of poultry egg production in Bauchi Local Government Area (LGA) of Bauchi State was conducted to examine the profitability of poultry egg production based on the different scale of production found in the study area. The study used all the 37 farm units of poultry egg production in the area. Farm budgeting technique and profitability indices were used to analyze the profitability of the small, medium and large scale poultry production and the result was found to be ₦0.26, ₦0.28 and ₦0.30 respectively. ANOVA and LSD tests confirmed that though the figures from the profitability indices were close, but are statistically different. Although egg production was found to be profitable, it was recommended that the scale of production be increased.

Keywords: Poultry, Egg, Cost and Returns, Production, Profitability.

INTRODUCTION
Poultry refers to all birds of economic value to man as source of meat, egg and fibre. Egg production involves the use of good layer birds for the purpose of table egg production (Ogunlade and Adebayo, 2009). Eggs are major sources of animal protein in human diet. According to Oji and Chukwuma (2007) the poultry goes a long way in providing animal protein for the populace because it yields quickest returns and provides for meat and eggs in a very short time. Esingmer (1991) and Banerjee (1992) added that poultry eggs nearly approach a perfect balance of all food nutrients. The yolk and albumen contain 17.5% and 10% respectively protein by weight. It was also found by the Food and Agricultural Organization of the United Nations (FAO, 1990) that eggs rank second to cow milk in terms of nutritive value and are the most economically produced animal protein. The dearth in the quantity and quality of protein supply in Nigeria is a challenge that is beyond dependence on plant protein alone. According to Fasasi (2006), Nigeria has a total land area of 98.3 million hectares out of which 71.3 million hectares are cultivable, while 34.2 million hectares representing 48% of the cultivable area are actually being cultivated and less than 10% of the arable land is irrigated. It suffices therefore, to explore quality protein of animal origin of which poultry egg is of prime importance.

The Federal Ministry of Agriculture and Natural Resources (1998) and Eduvie (2002) stated that Nigerian poultry industry is dominated by small-holder farmers who on the aggregate raise bulk of the birds for egg production and meat, but individually rear less than 1000 birds using different production strategies in consonance with little resources available to them. Generally, for farmers to achieve optimum production in farming, they have to use the inputs available at their disposal efficiently. (Udoh and Akintola, 2001). This study intends to evaluate how the poultry egg farmers manage resources for optimal profit and sustainable egg production. Increasing profitability within the agricultural sector particularly among small-scale poultry egg producers require a good knowledge of the current profit or loss inherent in the subsector. This is because despite the growth in the egg production industry since year 2000 in Nigeria (Tijjani et al., 2006), local demand has not been matched by local supply. It is against this background that this study examines the profitability of poultry egg production in Bauchi Local Government Area (LGA) of Bauchi State.
MATERIALS AND METHODS

This study was carried out in Bauchi LGA of Bauchi State, Nigeria. Bauchi LGA is one of the 20 LGAs of the State located in the North-eastern part of the country. The projected population is 611,458 people by the end of 2013 (based on the 2006 NPC information). The LGA occupies a total land area of 3,687sq.km and is located between latitude 10.18° and 57.00° N of the Equator. Longitudinally, the LGA lies between longitude 9.50° and 39.00° E of the Greenwich Meridian (Bauchi State Diary, 2010). Arable farming is the main agricultural practice in the area. Pearl millet, sorghum, water melon, sweet potato and legumes are produced in commercial quantities as principal crops. The farmers in the study area also embark on small, medium and large-scale livestock production such as rearing of goats, sheep, cattle and poultry as well as marketing of their products.

Bauchi Local Government has the largest concentration of poultry eggs farms (37) in the state based on the information provided by Avian Influenza Control Project (2010). Because of the limited number, all the 37 poultry farms in the LGA were selected for the study. These farms were scattered all over the LGA with more concentration in Hardo Dan’iya, Majidadi, Birshi miri, and Kangere Tirwun communities. The farms interviewed were structured into small, medium and large scale farms. This is because of the differences in their scales of production and there is need to have a true representation. The study adopted classification of Omotosho and Ladele (1988) in which farms with less than 1000 birds are considered as small poultry farms, those with 1000-4999 birds as medium poultry farms and those farms that have 5000 and above birds as large farms based. This classification was adopted because it is the most widely used in the country. Well-structured questionnaire was used to get relevant information from each of the 37 poultry egg farm units of the L.G.A.

Farm budgeting techniques as stated by Olukosi and Erhabor (1988) and the profitability index were used for the profitability analysis. The model for estimating the NFI is represented by the following equation:

\[
\text{NFI} = \text{GI} - \text{TVC} - \text{TFC} \quad (1)
\]

The fixed assets (like buildings and machinery) were depreciated using the straight-line method. Depreciation is the difference between the purchase value (P) and the salvage value (S) divided by the number of years of life of the asset. It is given by the formula:

\[
D = \frac{P-S}{N} \quad (2)
\]

Where:
- D = Depreciation (\text{N})
- P = Purchase value (\text{N})
- S = Salvage value (\text{N})
- N = Number of years of the asset (No.)

According to Ronald et al. (2008), NFI should be considered more as a starting point for analyzing profitability than as a good measure of profitability itself. Profitability is a measure of the efficiency of the business in using its resources to produce profit or net farm income. So, in order to conclude whether the enterprise is profitable or not, profitability index was computed as follows:

Profitability Index (PI) – This is the Net Farm Income (NFI) per unit of Gross Revenue (GR). That is:

\[
\text{PI} = \frac{\text{NFI}}{\text{GR}} \quad (3)
\]

Equation (3) shows the level of return per naira gross income. For a farm to be profitable, the PI should be greater than zero. If PI is negative, it implies that the farm is operating at loss or is not making any profit. The following profitability measures were calculated.

i. Rate of Returns on Investment (%)

\[
\text{RRI} = \frac{\text{NFI}}{\text{TC}} \times 100\% \quad (4)
\]

Where: TC = total cost, hence (TVC + TFC)

Equation (7) shows the ratio of the accounting profit to the investment in the farm, expressed as a percentage. The RRI should be greater than the cost of capital for the investment to be worthwhile. The RRI should also be greater than or equal to the interest/hurdle rate.

ii. Capital Turnover (CTO):

\[
\text{CTO} = \frac{\text{TR}}{\text{TC}} \quad (5)
\]

Where: TR = Total Revenue

CTO is defined as the total revenue divided by total cost of production. It describes roughly how much naira in revenue the farm can generate for each naira invested over a given period. That is, it is used to analyze the relationship between the money used to fund operations on the farm and the sales generated from the operations. This ratio should be greater than 1 for the investment to be profitable.
RESULTS AND DISCUSSION

Cost, Returns and Profitability of Poultry-Egg Enterprise in the Study Area

The result of costs, returns and profitability of poultry-egg enterprise by farm sizes was presented in Table 1. It was found that over 90% of the cost of production was on the variable inputs. The result also revealed that large farm had the lowest cost of production per bird and as the farm size decreases the total cost of production increases. This could be due to the fact that large farm size enjoys the benefit of pecuniary economies. Feed costs constituted the highest percentage of the costs, accounting for 79.21%, 77.04% and 78.81% for the small, medium and large flock sizes respectively. This is followed by cost of labour, cost of stock, veterinary services, while utility and other costs constituted the least in the cost of production. This validates the claims by Olayemi and Roberts (1979), Ubosi and Sekoni (2000) that cost of feed is the largest single variable cost in animal production (including poultry).

The Net Farm Income (NFI) per bird from the enterprise for small farm was ₦1,359.59 and that of medium and large farm sizes were ₦1,474.03 and ₦1,463.27 respectively. This indicated that medium farm size had the highest NFI per bird; whereas the small farm size made the least NFI of ₦1,359.59. This may be as a result of the fact that medium scale farms are more efficient in marketing than the small and large scale farms. On the other hand, large scale farms when oversupplied may be ready to dispose eggs at lower prices due to the fear of losing them overtime. This confirmed the statement by Scherer (1980) that profitability is not solely a function of largeness. Profitability reflects the overall suitability of firm’s size in relation to its market environment and not just production and cost. These results were very close to the ₦1, 494.88 reported by Adepoju (1999). Dama et al., (2002) in their analysis on poultry reported much lower NFI value of ₦140.22. Rate of return on investment per bird from small farm size, medium farm size and large farm size were found to be 34.94%, 38.88% and 42.39% respectively. Musa et al., (2004) and Ajala et al., (2007) found higher results of 59% and 54% respectively.

The Capital turnover per bird was 0.35 for the small farm size, 0.39 for the medium farm size and 0.42 for the large farm size respectively. The capital turnover values imply that for every naira invested in small scale poultry-egg production, ₦1.349 was returned to the farm as revenue. For every naira spent on medium scale poultry production, ₦1.389 was generated as revenue. Similarly, ₦1.424 was obtained as revenue for every naira invested in large scale poultry-egg business in the area.

The profitability indices for the small farm size, medium farm size and large farm size were 0.26, 0.28 and 0.30 respectively. This implies that for every naira earned as revenue from each of the different categories of farms, 26 kobo, 28 kobo and 30 kobo are returned to the three categories of farmers as net income respectively. The figures were found to be statistically different from the Least Square Difference test carried out. The profit made by the different farm may be as a result of many factors, such as cost of bird, and volume of sales among others. All these differ depending on farm size.

With these values of capital turnover and profitability index, improvement in poultry egg production through use of modern equipment and devising a means of getting inputs at cheaper rates is likely to increase the returns of poultry egg farmers in the study area. The higher RRI, CTO and PI of 42.37%, 1.42 and 0.30 respectively obtained by the large scale poultry farmers in the study area revealed that poultry-egg production, in general, was profitable and the large farm size had the highest profit, followed by medium farm size and then small farm size.

Test of Differences in Profitability among the Different Farm Sizes.

Analysis of Variance (ANOVA) and Least Square Difference (LSD) tests were carried out to establish whether significant difference exists among the 3 categories of farms in terms of NFI as proxy for profit. The result presented in Table 2 showed the average NFI/Bird of the small, medium and large scale poultry farm in the study area. The F-value (198.00) revealed that there were significant differences among the profit obtained by the three sizes of the poultry farm under consideration. The LSD value (23.67) further proved that the profit obtained were statistically different from one another. Average NFI (₦1,474.03) of the medium scale poultry farmers was significantly higher than other two groups. The higher RRI, CTO and PI of 42.37%, 1.42 and 0.30 respectively obtained by the large scale poultry-egg farms in the study area was not a surprise because it was revealed in the technical efficiency results that large scale farms were more technically efficient. Also, bulk purchases of inputs and large operation may lead to reduction in their cost and allow them to enjoy the economy of scale. The profit of the small scale poultry-egg producers was lower compared to the medium and large scale in the study area.
CONCLUSION AND RECOMMENDATIONS

Based on the findings from the study, it can be concluded that the largest proportion of poultry-egg producers (17) in the area operated on a small-scale and that poultry-egg production was a profitable venture across scale of operation. However, the following recommendations if implemented will widen the profit margin of the poultry-egg producers in the study area. First, the poultry egg producers in the area should be encouraged to increase their scale of production for increased profitability. This could be achieved if small scale farmers can come together and pool their resources together into cooperatives. Secondly, there is need for the poultry-egg producers associations and/or corporate bodies to establish at least a modern feed mill in the state to provide feeds to the farms at cheaper rates.

Table 1: Cost and Returns of Poultry Egg Farmers (₦ per bird).

<table>
<thead>
<tr>
<th>Cost Item</th>
<th>Small</th>
<th>Medium</th>
<th>Large</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Variable Cost</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stocking</td>
<td>222.19</td>
<td>191.25</td>
<td>175.42</td>
</tr>
<tr>
<td>Feeding</td>
<td>3,082.27</td>
<td>2,920.74</td>
<td>2,721.48</td>
</tr>
<tr>
<td>Labour</td>
<td>205.07</td>
<td>244.73</td>
<td>199.25</td>
</tr>
<tr>
<td>Vet. Service</td>
<td>192.23</td>
<td>186.40</td>
<td>180.60</td>
</tr>
<tr>
<td>Utility and other costs</td>
<td>100.39</td>
<td>202.41</td>
<td>136.75</td>
</tr>
<tr>
<td><strong>Total variable cost</strong></td>
<td>3,802.15</td>
<td>3,745.53</td>
<td>3,413.50</td>
</tr>
<tr>
<td><strong>Total fixed cost</strong></td>
<td>89.11</td>
<td>45.56</td>
<td>39.71</td>
</tr>
<tr>
<td><strong>Total cost</strong></td>
<td>3,891.26</td>
<td>3,791.09</td>
<td>3,453.21</td>
</tr>
<tr>
<td><strong>Revenue</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Egg</td>
<td>4,528.89</td>
<td>4,631.37</td>
<td>4,226.58</td>
</tr>
<tr>
<td>Spent layer</td>
<td>593.06</td>
<td>500.89</td>
<td>522.17</td>
</tr>
<tr>
<td>Manure</td>
<td>110.35</td>
<td>108.22</td>
<td>151.93</td>
</tr>
<tr>
<td>Empty bags</td>
<td>18.55</td>
<td>24.64</td>
<td>6.25</td>
</tr>
<tr>
<td><strong>Total revenue</strong></td>
<td>5,250.85</td>
<td>5,265.12</td>
<td>4,916.48</td>
</tr>
<tr>
<td><strong>Net farm income</strong></td>
<td>1,359.59</td>
<td>1,474.03</td>
<td>1,463.27</td>
</tr>
<tr>
<td>Rate of return on investment (%)</td>
<td>34.94</td>
<td>38.88</td>
<td>42.37</td>
</tr>
<tr>
<td>Capital turnover</td>
<td>1.35</td>
<td>1.39</td>
<td>1.42</td>
</tr>
<tr>
<td>Profitability index</td>
<td>0.26</td>
<td>0.28</td>
<td>3.0</td>
</tr>
</tbody>
</table>

Table 2: Test of differences in profitability between the different farm sizes.

<table>
<thead>
<tr>
<th></th>
<th>Small Scale</th>
<th>Medium Scale</th>
<th>Large Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total cost</td>
<td>3,891.26</td>
<td>3,791.09</td>
<td>3,453.21</td>
</tr>
<tr>
<td>Total Revenue</td>
<td>5,250.85</td>
<td>5,265.12</td>
<td>4,916.48</td>
</tr>
<tr>
<td>NFI</td>
<td>1,359.59</td>
<td>1,474.03</td>
<td>1,463.29</td>
</tr>
<tr>
<td>(6.264)</td>
<td>(1.637)</td>
<td>(2.744)</td>
<td></td>
</tr>
<tr>
<td>P I</td>
<td>0.26</td>
<td>0.28</td>
<td>0.30</td>
</tr>
</tbody>
</table>

a,b,c NFI bearing different superscripts are different (P<0.01).
F – Value: 198.00***, LSD – 23.67.
Figures in parenthesis are standard error
*** Significant at 1%
REFERENCES


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