



IMPROVING PROFIT FOR SMALL-SCALE BROILER ENTERPRISE USING SELF FORMULATED DIET IN SOKOTO STATE

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ABSTRACT: *This study was undertaken to assess the role of self formulated diet in reducing broiler feed cost in Sokoto State. To source for data, the experiment was conducted at the research farm of Shehu Shagari College of Education, Sokoto. Three diets containing nutrient levels recommended by literature were self formulated using local ingredients. Ultima brand of commercial feed was used as a control. One hundred and eighty strains of Ross chicks were procured and divided into four groups of forty-five birds per diet and 15 per replicate in a completely randomized design. Diets were coded as Local Diet 1 (LDI), Local Diet 2 (LD2), Local Diet 3 (LD3) and CR (Commercial diet). Feed and water were fed ad libitum; the experiment lasted 49 days. Farm budgetary tools were used to calculate profitability and economic efficiency for each enterprise. The results of the study showed that birds fed commercial diet were more profitable to keep.*

KEYWORDS: Profit; broiler enterprise; self formulated diet; Sokoto State.



INTRODUCTION

For quite sometime, there has been a persistent advocacy on the improvement of the world's nutritional status, especially in developing countries, through substantial increase in the intake of protein foods of animal origin; coupled with this is the need for the diversification of the agricultural economies of many developing countries. Intensive poultry production is probably one of the fastest and most economical routes to achieve the most desired objectives of increased animal protein intake, as well as the diversification of several agricultural economies. The livestock sub sector of the Nigerian economy plays an important role in the country's development. Livestock contributes to people's livelihood through provision of income, food, employment, transport, farm power, organic manure, insurance against risk and social prestige. Livestock rearing is an essential part of Nigeria's economy catering for at least 13 million households and contributing about 6–8 percent of the national GDP in 2018 (FAO, 2018). These figures revealed the enormous contribution made by the livestock sector to people's livelihood and national economy.

The major constraint to poultry production in Nigeria is feed cost. Food grains for human consumption are in high demand and they compete with poultry for feed production; as a result the cost of commercial feed is high and mostly erodes profit for small scale poultry farmers. Feed cost is estimated to account for the largest share of variable cost in broiler enterprise (Helena, 2021; Akpodiete et al., 2001). This trend has a negative impact on the profitability and production efficiency of small scale broiler producers in Nigeria. In order to sustain broiler production, small scale broiler keepers should be motivated by ensuring that they get as much meat for the money spent on feed. The concern for high cost of commercial feed is driving away small scale poultry keepers from taking advantage of the rising income offered by the broiler enterprise. This important role played by the broiler enterprise necessitated the need to develop a means of minimizing the cost of feeds, to make the venture more profitable and encourage more people to venture into it. Developing cheaper, quality self formulated diets using local feedstuffs will help small scale farmers bring down cost of production, raise profit as well as improve their production efficiency. The main objective of this study was to evaluate the possibility of making small scale broiler enterprise more profitable and economically efficient through the use of self formulated diets, using alternative local feedstuffs available in Sokoto State.

However, there have been many studies in the livestock sub sector of Nigeria on the comparative assessment of the use of commercial and self formulated diets for poultry, with the major aim of lowering cost (Sanusi et al., 2015; Hassan et al., 2011; Apantaku et al., 2006). Analyses of most of these studies conducted did not cover the northern part of the country. In fact, no study focused on Sokoto State in north western Nigeria. Similarly, most of the studies used smaller sample size and their analyses were not based on real farm experimental data. There is therefore a dearth in data on how broiler birds will respond to self formulated diets and the implication on the profitability of broiler enterprise in the area. This study attempted to bridge this gap in knowledge by providing insight on the role of self formulated diets in improving profit for small scale broiler enterprise in Sokoto State. This paper is organized as follows. In the literature review section, a brief exposition of similar previous empirical studies on broiler feed cost minimization was made. In the next section, the outline of the method of the study was given. Later, the results of the study were presented and lastly, conclusion was made based on the findings of the study.



LITERATURE REVIEW

Use of Self Formulated Diet for Broiler Production

In an effort to solve the problem of high cost of poultry feed, many studies were conducted with the aim of bringing down the cost of small scale poultry production through the use of self formulated diets. In Nigeria, Oladokun and Johnson (2012) consider the use of linear programming technique to formulate poultry diet. The findings of the study showed that the application of linear programming will lead to higher productivity in poultry. The study concludes that about 90% reductions in feed cost could be achieved using self formulated diets. Similarly, In India, linear programming tool was applied to optimize feed cost; the results of the study showed that with proper feed mix, feed cost could be cut. The study concludes that self formulated diets using local feed ingredients could be used to reduce cost of poultry feed.

In Nigeria, Olubenga et al. (2015) tested the role of self formulated diets in reducing poultry feed cost. The formulation gave about 78% reduction in feed cost. The study concludes that poultry feed cost could be reduced with good planning. Additionally, in Nigeria, Samuel et al. (2019) tested the use of self formulated diets to feed poultry; the study revealed that broiler production cost could be reduced with efficient self formulation techniques. Apantaku et al. (2020) investigated poultry farmers' preference for commercial and self formulated rations in Oyo State, Nigeria. The findings of the study showed that a significant relationship exists between choice of commercial and self formulated diets among farmers due to quality, cost of feed and availability of feed ingredients. The study concludes that poultry farmers prefer using self compounded diets on the basis of cost and quality. Similarly, Hassan et al. (2011) conducted a study on economic analysis of broiler production on on-farm formulated and commercial feeds in Igabi Local Government Area of Kaduna State, Nigeria. The results of the study reveal that on-farm feed formulation is economically profitable with regards to body weight gain and low feed cost for broiler birds. The impact of self formulated diet on the growth performance was also compared with commercial ration by Sanusi et al. (2015) in a study titled, *The Effect of Self-formulated and Four Commercial Diets on the Growth Performance, Carcass and Haematological Parameters of Broiler Finishers in the Tropics*. The study found that feeding self-formulated diet could be used to finish broiler birds at a cheaper rate and at more profit to the farmer without any detrimental effect on growth, internal organs and hematological parameters.

Objectives

The following are the specific objectives of the study:

1. To identify the least cost combination of poultry feed ingredients available in Sokoto State.
2. To evaluate profitable diet plans for small scale poultry enterprise.
3. To identify diet plans that will produce economically efficient enterprise.



Hypothesis of the study

H₀: Self formulated diets do not raise profit for small scale broiler enterprise in Sokoto State.

H₁: Self formulated diets raise profit for small scale poultry enterprise in Sokoto State.

MATERIALS AND METHODS

The research was carried out at the research farm of Shehu Shagari College of Education, Sokoto, Sokoto State, Nigeria, between December 2022 to February 2023. One hundred and eighty day old Ross strain of broiler chicks with an average initial body weight of 52.6 grams/chick were randomly assigned to four pens in a deep litter house. A completely randomized design with three replicates of fifteen birds per replicate was applied. The treatment consists of three least cost self formulated diets plans and one commercial diet as a control. The diets were coded local diet 1, 2 and 3 while the commercial ration was coded CR. The self formulated diet plans were varied according to different ingredients sourced locally but uniform in energy and protein levels recommended by literature. Local ingredients commonly used to formulate poultry diets in the area were used to make the self formulated diets. Proximate composition, energy and protein levels of the self formulated diets were of least cost and were determined by linear programming technique. Ultima brand of commercial diet was used. Ingredients for self formulated diets were milled and formulated at the farm. Self-formulated diets were formulated in two feeding schedules: Starter and Finisher. At starter phase, all the chicks were fed with same commercial diet under same management conditions. Broiler finisher phase was fed from 5 to 8 weeks. The commercial diet was also given in that sequence and water was given *ad-libitum* for 49 days. The commercial diet was also given in that sequence. Birds were weighed weekly to observe the gain in weight, while feed intake and mortality were recorded on a daily basis for each group. Feed intake, body weight gain, feed conversion ratio and feed efficiency were the performance parameters that were evaluated. At the end of the experiment, birds fed by each category of diet were individually weighed and the average weight of each group was recorded. Birds were sold on weight basis. But before then, costs of commercial and self formulated diets per kg, selling price/ bird, total cost of production and revenue were calculated for each group of birds. Budgeting and break-even analyses were done for each group to determine the profitability and efficiency for each enterprise.

Analytical Techniques

The following techniques were used to achieve the objectives of the study:

Objective One was achieved using a linear programming tool to formulate least cost poultry diets using local feed ingredients. Objective Two, which was to evaluate the profitability of each diet plan, was achieved through enterprise budgeting technique. Objective Three of the study, which was to compare the production efficiency of birds fed different diet plans, was achieved by the use of profit and gross margin analyses.



DESCRIPTIVE STATISTICS

Descriptive statistics was used to show the performance of competing broiler enterprises fed different plans of diets. For all the four plans of diets, commercial diet was the most expensive costing about 370/kg, while for the local diets, LD3 cost about 260/kg to formulate and LD1 was the most expensive to formulate costing 321/kg. Comparing cost between the commercial diet and the three local diets, the farmer could save ₦49/kg when LD1 is formulated, ₦55/kg when he formulates LD2 and ₦110/kg when LD3 is formulated. At eight weeks, the average live weight per bird recorded was 1.2 kg for birds fed LD1, 1.7kg for birds fed LD2, 2.5kg for birds fed LD3 and 3.6kg for birds fed CD. At the end of the experiment, birds were priced based on diet fed to them. Birds fed CD were priced at ₦3781, ₦3350 for birds fed LD 3, ₦2850 for birds fed LD 2 and ₦2500 for birds fed LD1. When the average cost of production was estimated, it was found that the average cost of producing each bird fed LD 1 was ₦4194, ₦3275 for birds fed LD2, ₦3528 for birds fed with LD3 and ₦3416 for birds fed commercial diet. Average revenue generated per each bird was also estimated and it was found that for birds fed LD1, a revenue of ₦3045 was generated, while ₦2921 was generated by birds fed LD2 plan; birds in LD3 plan generated a revenue of ₦3557. The highest revenue ₦3939 was generated by birds fed CD plan. Profit per enterprise was also estimated, birds fed LD1 and LD2 declared a loss of ₦25287 and ₦9905 respectively while a profit of ₦770 and ₦14988 was declared by birds fed LD3 and CD.

Enterprise Budget

An enterprise is defined as a single entity from crop or livestock sectors that can produce a commodity for commercial purpose. One of the basic functions of a farm manager is to decide the combination of enterprises that is profitable to produce. It is essentially a process of itemizing all income and expenses involving a particular enterprise to evaluate the profitability of an enterprise. In farm management, enterprise budget provides several tools to enable the manager evaluate the profitability and efficiency of a particular enterprise. This could be used as a basis for comparisons between several competing enterprises. The important information provided by enterprise budget can be used to decide whether to continue or discontinue operating the enterprise. To achieve Objective Two of this study, which is to evaluate the profitability of the four diet plans, three tools of enterprise budget technique, namely net farm income, rate of return on naira invested and the break even analysis, were used.

1) Net Farm Income

In order to improve profit, it must be first measured. One good measure of estimating farm profit is the net farm income also known as economic farm surplus. This is given by:

$$\text{NFI} = \text{GFI} - \text{Variable} + \text{Over head cost (excluding overhead cost)} + \text{Imputed cost}$$

2) Return on Naira Invested

Return on Investment is an important consideration in farm business decisions especially when the farmer needs to borrow money for the future expansion of the business. The rate of return on investment provides a measure of the return on the whole farm investment. For a good showing, the rate of return on investment should be higher than the interest payment on debt. This shows that the investment is able to service interest on loans and have some left over funds for the growth of the business.



$$\text{RNI} = \frac{\text{Total farm income}}{\text{Total cost of production}} \times 100$$

3) Break-even Analysis

Break-even analysis is a useful tool in enterprise budget. The break-even point occurs when total receipts equal total costs. Break-even analysis can be used as a tool to determine the break-even prices at various yields and the break-even yields at given prices. The break-even points can be calculated as follows:

a) Break-even Price: A pricing point above the break-even point will be needed to generate profit. This is the minimum price per unit required to cover all projected costs at the expected yield. It indicates an average price you must receive to be able to cover all your costs in the current production season. The break-even price can help you weigh alternative marketing plans to enable you to decide profitable enterprises for the market you face.

$$\text{Breakeven sale price} = \frac{\text{Total cost}}{\text{Total production(yield)}}$$

b) Break-even Yield: This point indicates the output required at a given price to increase net income. It is the minimum yield required to cover all projected costs at the expected price per unit. It gives a picture of the production target that you must meet to cover all costs in the current production season. Break-even yield will enable the manager to weigh competing production plans and decide the best enterprise for your operation.

$$\text{Break-even yield} = \frac{\text{Total costs}}{\text{Sale price}}$$

Break-even analysis can be used to estimate a mix of price and yield that will cover projected costs. When the expected price is obtained and/or the expected yield generated exceeds the break-even price or break-even yield, it implies that both the fixed and variable costs are covered and that the enterprise is profitable to operate.

Efficiency Analysis

$$4) \text{ Profit Margin} = \text{NFI/GFI} * 100$$

Profit margin provides a useful measure of farm efficiency. Profit margin is given by net farm income over gross income times 100. It estimates the proportion of profit saved as a result of operating the business alternatively. It indicates the amount of profit yielded by each ₦ invested.

$$5) \text{ Gross Margin} = \text{GM} = \text{GR-TVC}$$

Gross margin is the difference between revenue from the sales of produce and the variable costs incurred when producing the produce. Gross margin analysis is a useful tool used in identifying enterprises with higher return. Gross margin analysis can be used to assess the technical and economic efficiency of individual enterprises in farm business. Although, traditionally, there are several tools to measure profit and efficiency, a more suitable tool to measure performance between competing enterprises is the gross margin analysis. A gross margin for an enterprise is its financial output minus its variable costs. The gross margin per



enterprise can be compared with standards to give an indication of profit and economic efficiency of the competing enterprises on the same farm.

RESULTS AND DISCUSSION

Profitability Analysis for Broiler Enterprise per Production Cycle

The profitability analysis for broiler enterprise based on different diet plans was presented in Table 3. Figures on the table showed that the total cost of production for each enterprise per production cycle was obtained by summing the total variable and total fixed costs incurred by each enterprise. The total costs of production for producing birds fed LD1, LD2 and LD3 were ₦92,287, ₦91,705 and ₦91,730 respectively. However, the sum of ₦95,650 was spent in producing birds fed commercial diet plan, CD. The entries for total revenue showed that net revenue of ₦67,000 was made by birds fed LD1 and the sum of ₦81,800 was declared as revenue by birds fed LD2 and ₦92,500 for birds fed LD3 in one production cycle. Birds fed commercial diet plan generated the sum of ₦110,588 as net revenue. In terms of total cost of production per enterprise per production cycle, analysis showed that the enterprise fed commercial diet plan CD had the highest cost of production followed by LD3 enterprise. Birds in LD2 enterprise had the lowest cost of production. Birds in the commercial enterprise are the most expensive to produce in view of the high cost of commercial feed (₦370/kg). The findings of this study on low cost of self formulated diets agree with results of Apantaku (2006); Adeshinwa et al. (1996); Adebayo et al. (2002) and Afolayan et al. (2009). In their analyses, they reported that self formulated diets are cheaper to produce than commercial feeds. Another explanation for the high cost of production for the commercial enterprise is that the feed accounts for the component of cost with the highest share of the cost of production. The relatively low cost of production in the enterprises where birds were fed self formulated diets could be due to low cost of ingredients used in producing the diets which were sourced locally.

Comparing revenue generation between enterprises, analysis of the results showed that the enterprise which the birds were fed commercial diet had the highest revenue of ₦110,588; this is followed by LD3 enterprise with revenue of ₦92,500, and the enterprise with the least revenue was LD1 with ₦67,000. Net farm income analysis is a useful tool used for comparing the profitability of competing enterprises. Findings of the study based on net farm income analysis revealed that the enterprise fed commercial diet had the highest net farm income of ₦14,988 followed by LD3 enterprise with ₦770; LD2 and LD3 enterprises had a negative farm income, implying that the enterprises were run at a loss. The loss incurred by LD2 and LD1 enterprises could be attributed to low feed quality which results in poor performance of the birds fed those diet plans in terms of body weight gain which determines the prices of the birds at the point of disposal. This finding is contrary to Sanusi et al. (2015), who reported better final weight gain for birds fed a self formulated diet. Rate of return on Naira invested as a measure for enterprise profitability was also considered by the study. The finding of the study showed that birds fed commercial diets had a higher rate of return on investment. The high rate of return on investment for enterprise fed commercial diet implies that commercial diet enterprise could generate enough revenue to cover its investment with some left over for business growth. Following the commercial diet enterprise on high rate of return on investment was the LD3 self formulated diet.



Analyses for breakeven prices and yields were conducted for different diet plans. Break-even price, which is the minimum price per kg of broiler meat required to cover all costs for enterprises fed different diet plans at the expected yield, was determined. The result of the breakeven price showed that for the birds fed LD1 diet plan, a breakeven price of ₦2,747 was required for the enterprise to cover all costs at the expected yield. This implies that it is the minimum price that must be received by the enterprise to cover all costs for the current production cycle. This was followed by the LD2 enterprise with a breakeven price of ₦1,927, and then LD3 enterprise fed diet 3 plan with a price of ₦1,425. Lastly, CD plan enterprise had the least breakeven price of ₦948. Analysis of the result further revealed that out of the four enterprises, only the enterprise fed commercial diet received a price that is higher than the breakeven price. The breakeven price for the enterprise was ₦948, but on the average, each kg of meat for the group was sold at ₦1075. All the three enterprises fed self formulated diets received a price that is far below the breakeven prices; this implies that the prices received for each kg of meat produced by the birds fed each of the three self formulated diets will not cover their costs of production. Therefore, based on breakeven price analysis, only enterprise fed commercial diet was able to cover its total cost of production, hence making it the only profitable enterprise.

The good breakeven price as a measure of profitability by the enterprise fed commercial diet could be attributed to the high quality of the diet. To further support the findings of the study, breakeven yield analysis was conducted for all the four enterprises. The analysis could give an indication of the average weight each bird should attain at the expected price per unit to be able to cover the cost of production. The results of the study showed that the average weight attained by birds fed LD1 diet was 1.2 kg/bird. To breakeven and pay total cost, the group should produce birds that on the average should weigh 2.35 kg/bird. Birds fed LD2 diet had an average weight of 1.7 kg/bird. On the average, birds should weigh 2.33 kg/bird to breakeven. Interestingly, birds fed LD3 diet were just able to break even, with 2.5 kg/bird as the average actual yield and 2.54 kg/bird as the breakeven yield. Birds fed commercial diets have exceeded their breakeven yield with the breakeven yield of 2.44 kg/bird and the actual yield of 3.6 kg/bird. The good performance of birds fed commercial diet CD and LD3 plan could be attributed to good quality diets.

Economic Efficiency Analysis for Broiler Enterprise per Production Cycle

Profit Margin

Profit margin was also used in the study to evaluate economic efficiency between the enterprises. It gives a measure of the proportion of farm income kept as operating profit. In other words, it estimates the amount of profit generated by each naira in the business. LD3 and CD enterprises generate positive profit margins with the enterprise fed commercial diet plan, generating 13.5% in profit margin and around 1% for LD3, while the enterprises fed LD1 and LD2 diets had negative profit margins. These results implied that the broiler enterprise fed commercial diet and LD3 diets were more economically efficient than other enterprises, while resources, mainly feed, were not optimally utilized by the birds in LD2 and LD 1 enterprises, which recorded negative profit margins. The good showing by the enterprise fed commercial ration could be due to the good quality diet fed to the birds.



Gross Margin Analysis

Gross margin analysis was also considered in the study as an efficiency indicator. The findings of the study based on gross margin analysis revealed that broiler enterprise fed commercial diets had higher returns than the other enterprises. This was followed by enterprise fed LD3 diet plan 3. This implied better profit and efficiency for enterprises in the commercial and LD3 diet plans compared to other enterprises.

CONCLUSION

In Nigeria, the main policy thrust of several administrations in the livestock sub sector was to step up local production of poultry and poultry products with the major aim of improving protein intake for citizens and increasing income for small scale farmers. To achieve this goal, it is essential to reduce feed cost, which accounts for over 70 percent of the cost of production and by implication, erode profit for farmers. The major objective of the study was to identify cheap, quality local poultry feed ingredients that are suitable for use in self formulated diets in Sokoto State and assess their potential in increasing profit margin for small scale poultry farmers. Based on this premise, the current study employed enterprise budget tools such as the net farm income, return on investment, and breakeven analysis to evaluate its results. The findings of the study showed that broiler enterprise fed commercial diet plan was more profitable to keep in the study area. Similarly, gross margin and profit margin analyses conducted to assess economic efficiency between enterprises indicated that birds fed commercial diet plan were more efficient in the use of resources. However, it is worthy to note that with some improvements, self formulated diet plan 3 could also be used to produce a profitable enterprise. The study concludes that with proper selection and adjustments in the use of local feed ingredients, self formulated diets could be used to lower the cost of production and improve profitability for small scale broiler farmers in Sokoto State.

IMPLICATIONS FOR FUTURE RESEARCH

The major item of cost in poultry production is feed. There is an increasing concern, especially by the small scale farmers, that high cost of poultry feed limits profit and discourages small scale poultry keeping. Future research should focus on identifying potential cheap ingredients that could be sourced locally and used by small farmers in the formulation of poultry diets. Extension workers should be trained to be competent enough to equip farmers with the basic knowledge of using local feed ingredients to formulate cheap quality poultry diets by themselves. The need for research into using local feed ingredients for producing self formulated diets for the broiler industry as a replacement for the conventional poultry feeds cannot be overemphasized. This becomes necessary due to high feed cost and less profit for farmers. Information on available feedstuffs and the possibility of using self formulated diet that could be used as a replacement for conventional feeds is limited. With a drive to increase the productivity of Nigeria's poultry industry and make it more profitable to farmers, it is important to explore other avenues to meet the nutritional requirement of the poultry at low cost to farmers.

**Table 1: Percentage composition of self formulated diets fed broiler birds at finisher stage**

Ingredients	Percentage			
	LD 1	LD 2	LD 3	CD
Maize	48.51	48.0	37.89	55
Wheat offal	11.92	9.67	0	3.25
Rice bran	0	0	7.85	17
Maize offal	0	5.09	27.97	0
Fish meal	0	0	0	0.250
Groundnut cake	26.30	23.30	7.11	0
Soya beans meal	8.67	5.57	0	16.60
Blood meal	0.81	3.69	14.50	5
Bone meal	2.0	3.54	3.53	0.50
Common salt	0.40	0.40	0.40	0.50
Limestone	0.11	0	0	0.50
Vitamin premix	0.250	0.250	0.250	0.250
Methionine	0.250	0.250	0.250	0.250
Lysine	0.250	0.250	0.250	0.300
Phytase	0	0	0	0.15
Multienzyme	0	0	0	0.25
Neobran	0	0	0	0.10
Toxic binder	0	0	0	0.10
Total	100	100	100	100
Nutrient composition				
Metabolizable energy (kcal/kg)	2800	2800	2800	3000
Crude protein (%)	23	23	23	23

Note: LD1 = Local diet 1; LD2 = Local diet 2; LD3 = Local diet; CD = Commercial diet

Table 2: Descriptive statistics of variables for broiler enterprise per kg per cycle

Variable	LD1	LD2	LD3	CR
Average feed cost ₦/kg	321	315	260	370
Average cost saving in feed ₦/kg	49	55	110	-
Average weight per bird at market age	1.2	1.7	2.5	3.6
Average price per bird at disposal	2500	2850	3350	3781
Average cost of production per bird	4194	3275	3528	3416
Average revenue ₦ per bird	3045	2921	3557	3939
Profit/loss per enterprise	-25287	-9905	770	14988

**Table 3: Profitability analysis for broiler per enterprise per production cycle**

Parameter	LD 1		LD 2		LD 3		CD	
	Amount(₦)	Percentage	Amount	Percentage	Amount	Percentage	Amount	Percentage
A. Variable cost								
Day old chicks	24000	26.0	24000	26.17	24000	26.16	24000	25.09
Feeds	31137	33.73	30555	33.31	31980	34.86	37000	38.68
Drugs	2600	2.81	2600	2.83	2600	2.83	2600	2.71
Labor	5000	5.41	5000	5.45	5000	5.45	5000	5.22
Electricity	0	0	0	0	0	0	0	0
Litter	500	0.54	500	0.54	500	0.54	500	0.52
Transport	1200	1.30	1200	1.30	1200	1.30	8000	8.36
Milling	500	0.54	500	0.54	700	0.76	0	0
Fuel	1600	1.73	1600	1.74	1600	1.74	0	0
Total variable cost	66537	72.0	65955	75.84	65980	71.92	69900	73.07
B. Fixed cost								
Building	15000	16.25	15000	16.35	15000	16.35	15000	15.68
Equip.& tools	10750	11.64	10750	11.72	10750	11.71	10750	11.23
Total fixed cost	25750	27.9	25750	28.07	25750	28.07	25750	26.92
Total costs A&B	92287		91705		91730		95650	
C. Revenue								
Revenue from Birds	55000		79000		90500		108388	
Revenue from manure	2000		2000		2000		2000	
Revenue from empty sacks	0		0		0		200	
Total revenue	67000		81800		92500		110588	
NF1	-25287		-9905		770		14988	
Return per naira invested	0.725		0.891		1.008		1.156	

**Table 4: Break-even analysis for broiler production per enterprise**

Item	LD 1	LD 2	LD 3	CD
Cost of production (₦)	92287	91705	92630	95650
Average price of broiler meat per kg (₦)	1400	1400	1400	1400
Breakeven price /kg to pay total cost(₦)	2747	1927	1425	948
Average actual price/kg (₦)	2083	1676	1340	1075
Breakeven yield in kg to pay total cost	2.35	2.33	2.54	2.44
Average actual yield	1.2	1.7	2.5	3.6

Table 5: Measures of efficiency for broiler per individual enterprise

Analysis	Diet			
	LD1	LD2	LD3	CD
Profit margin	-37.74	-1210	0.832	13.5
Gross margin	463	15845	26520	40688

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