

Assessment of Profitability of Livestock Enterprises in Enugu State, Nigeria

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Abstract

The study was conducted to assess the profitability of livestock production in Enugu State, Nigeria. Multistage sampling procedure was used to select 40 livestock farmers. A structured questionnaire complimented with interview schedule was used to obtain cost-route data from the farmers. Data were analyzed using farm budgeting technique. Results revealed that respondents were small-scale farmers who adopted mixed enterprises as a result of scarcity of land and to avoid failure. The results of the analysis showed that mixed livestock enterprises were more profitable than sole livestock enterprises. Livestock farming was profitable in the four agricultural zones. In Awgu agricultural zone, broiler/layer was the most profitable enterprises with a gross margin, net farm income and gross ratio of ₦981997.92, ₦892718.85 and 0.33 respectively. In Agbani agricultural zone, broiler/layer was the most profitable enterprises with a gross margin, net farm income and gross ratio of ₦971105.94, ₦878234.12 and 0.35 respectively. In Udi agricultural zone, sheep/goat was the most profitable enterprises with a gross margin, net farm income and gross ratio of ₦793961.56, ₦715619.22 and 0.38 respectively. In Enugu agricultural zone, broiler/layer/turkey was the most profitable enterprises with a gross margin, net farm income and gross ratio of ₦1086025.39, ₦993841.67 and 0.38 respectively. In the Enugu State (pooled), broiler/layer was the most profitable enterprises with a gross margin, net farm income and gross ratio of ₦868446.20, ₦780235.90 and 0.35 respectively. From the results it can be concluded that livestock farming is a lucrative and profitable agricultural enterprise and recommended that competent extension agents should be employed to visit and enlighten livestock farmers on the technicality of farming processes and how they can formulate feeds for their livestock. This will not only enhance the skills of the farmers but also create employment opportunities mainly to the youths and profoundly increase their incomes and improve their standard of living.

Keywords: Livestock Agriculture, Profitability, Livestock Farmers.

Introduction: Livestock agriculture is concerned with raising and maintaining livestock, primarily for the purposes of producing meat, milk, and eggs. Livestock agriculture also includes wool and leather production and may include animals kept for recreation (riding or racing) and draft. Livestock are those animals and birds which man has domesticated and multiplied for his benefits (Onyenweaku and Ozongwu, 2016). These animals produce food, fibre and labour. Iwena (2017) stated that Animal husbandry which is another name for livestock farming, is a rapidly growing arm of farming in Nigeria, and the primary reason why more entrepreneurial farmers are venturing into livestock farming is its profitability. The production systems of livestock are group into traditional and modern. The two systems differ essentially in the use of main factors of production with traditional systems based mainly on land and labour while modern systems have large capital requirements and generally lesser requirement for one of the other factors.

These production systems can also be grouped into three major systems which are; intensive, semi-

intensive and extensive systems. The choice of a particular management system for livestock production by a farmer is dependent on the purpose of production. Intensive system is the most suitable for commercial production of poultry and to an increasing extent for dairy cow production. Nyong, *et al.*,(2023).

Livestock farming in Nigeria include the following; poultry farming, pig farming, snail farming, cattle farming, goat farming, rabbit farming etc. Livestock farming is a lucrative and profitable agricultural enterprise. Small scale livestock farming is nonetheless affected by diverse factors and production constraints and has suffered a great deal of losses. Many small-scale operators in the livestock industry have been forced out of business due to myriads of factors such as diseases, shortage and high cost of quality feed. Farmers' characteristics, lack of proper management and traditional methods used by livestock farmers among other factors are responsible for the low productivity in Nigeria. Nyong, *et al.*,(2023).

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Farmers in Nigeria are faced with the problem of efficient allocation of the limited resources available to them and also identifying the best farm plans that will maximize their production and income. Many of the farm enterprises are associated with low incomes due to price fluctuations, poor utilization of scarce production resources and increasing land sub-division. To improve the low farm incomes, farmers have gradually diversified their farming activities by adopting other enterprises perceived to be high yielding with high market value. Farm diversification at optimal level therefore remains one of the best alternative strategies to alleviate poverty through increase and stable farm income under conditions of resource constraints and price instability. Farming in Nigeria is characterized by mixed farming. Several farmers diversify with the aim to reduce risk and increase profitability. It is assumed that if profit from one enterprise is poor, profit from producing and selling other products may prevent total profit from falling below acceptable levels. In agricultural production, diversification or enterprise combination may reduce income variability if all prices and yields are not low or high at the same time (Bamiro, 2007 cited in Bamiro, Adedeji, Otunnaiya, Soluade and Ogunjobi (2015); Nyong, *et al.*, 2023). Some other challenges faced by livestock farmer is lack of quality feed, outbreak of disease, middlemen exploitation and climatic change which has affected their production inefficiencies.

But to optimize production and ensure profitability and, there is need for efficient allocation of the resources employed in the enterprise. However, little or nothing has been done to look at the profitability among livestock farmers in Enugu State, Nigeria. In order to design appropriate policies that will bring about a profitability in poultry production, there is need to carry out a study on profitability in livestock production in the area and Nigeria as a whole (Nyong, *et al.*, 2023). Therefore, this study sought to estimate the gross margin, net farm income and gross ratio which were the indicators of farmers' performance and profitability of livestock farmers in Enugu State. The outcome of this study, will enable policy makers to identify areas for potential improvement considering the need to enhance

profitability among the small-scale livestock farmers in Enugu State. Particularly, this study will help to understand the levels of profitability and identify the enterprise combinations that are more profitable among farmers in Enugu State. It equally contribute to the general body of knowledge and provide basis for future research on the assessment of profitability of livestock enterprises in the Enugu State, Nigeria.

Materials and Method: The study area is Enugu State, Nigeria. The State comprises seventeen (17) local government areas. The state lies between latitudes $5^{\circ} 56'$ and $7^{\circ} 05'N$ of equator and longitudes $6^{\circ} 53' E$ and $7^{\circ} 55'E$ of Greenwich meridian. According to National population census (NPC, 2010), the population of Enugu State is about 3,257, 298 people with population growth rate of (+3.05%/year), Enugu population is 4 826 582. Multi-stage sampling technique was adopted for this study. At the first stage, four agricultural zones out of the six were randomly selected. These zones are Awgu, Agbani, Udi and Enugu agricultural zones. In the second stage, one local government area (LGA) was randomly selected from each of the selected agricultural zone. The Local government area selected were Awgu, Nkanu West, Udi and Isi-Uzo. In the third stage, two rural communities were purposively selected from each of the LGAs where farming is predominant or profound to avoid selecting an urban area where farming is taking as a secondary occupation giving a sample of eight communities. In the fourth stage one village was randomly selected from each community; giving a sample of eight villages. In the last stage, list of selected livestock farmers in the selected eight villages was compiled with the help of enumerators who are natives of the villages, from this list five livestock farmers were systematically selected, giving a sample size of 40 farmers for the study. Data for this study were collected from both primary and secondary sources.

Model Specification: Farm budgeting model: A farm budgeting model was used to estimate the costs and returns associated with the various crops and livestock enterprises undertaken by the smallholder farmers. The farm budgeting model following Adewumi, Tanko, Ibrahim and Yisa (2018), Jirgi, Adewumi, Yisa and Okpanachi (2018) and Adewumi, Tanko, Ibrahim and Yisa (2020) Nyong, and Nweze., 2012) was used and is specified thus:

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$$GM = \sum_{i=1}^n P_{yi}Y_i - \sum_{j=1}^m P_{xj}X_j \tag{1}$$

$$NFI = \sum_{i=1}^n P_{yi}Y_i - \sum_{j=1}^m P_{xj}X_j - \sum_{k=1}^o F_k \tag{2}$$

Where;

GM = Gross Margin,

NFI = Net farm income,

Y_i = Output per unit enterprise (where i = 1, 2, 3... n products),

P_{yi} = Unit price of the product,

X_j = Quantity of the variable inputs per unit enterprise (where j =, 1, 2, 3... m variable inputs),

P_{xj} = Price per unit of variable inputs, and

F_k = Cost of fixed inputs per unit enterprise (where k =, 1, 2, 3..., o fixed inputs).s

Results and Discussion

Table 4.1: Cost and Return Analysis of Livestock Enterprises Undertaken by the Farmers in Awgu

Livestock Enterprises	Average amount (Naira per tropical livestock unit- TLU)						
	TVC	TFC	TC	TR	GM	NFI	GR
Pig	232027.73	73101.42	305129.15	929839.38	697811.65	624710.23	0.33
Broiler	333299.20	87261.90	420561.10	1266180.32	932881.12	845619.22	0.33
Layers	240137.57	58036.25	298173.82	924985.16	684847.59	626811.34	0.32
Broilers/Layers	350331.46	89279.08	439610.54	1332329.39	981997.93	892718.85	0.33
Sheep/Goat	209942.44	49178.35	259120.79	780170.39	570227.95	521049.60	0.33
Pig + broiler	271025.02	71082.10	342107.12	1132398.31	861373.29	790291.19	0.30
Goat/Sheep+ broiler	265939.47	68170.26	334109.73	1025202.05	759262.58	691092.32	0.33
Broiler + layer	+318329.73	83610.47	401940.20	1228049.21	909719.48	826109.01	0.33

turkey

Note: TVC = Total variable Cost; TFC = Total Fixed Cost; TC = Total Cost; TR = Total Revenue; GM = Gross Margin; NFI = Net Farm Income and GR = Gross Ratio

The variable and fixed costs of production, revenue, gross margin and net farm income per unit enterprise were computed. The analysis of the livestock enterprises was done based on one tropical livestock unit (TLU). Costs incurred on breed stock, feed, veterinary services, vaccination and medications, labour and transportation constituted the variable cost

of the livestock enterprise. The fixed cost items were depreciation on farm tools and machinery, rent, tax and interest on borrowed capital. Gross margins as known reveals how much a firm (farm, company) earns taking into consideration the costs that it incurs for producing its products and/or services. Gross margin is a good indicator of how profitable a firm is at the most

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fundamental level, Nyong, and Nweze., 2012). Firms with higher gross margins will have more money left over to spend on other activities such as investment, improvement of production and marketing. Net farm income is the difference between gross income and total cost of production. It is used to show the levels of costs and returns that accrue to farmers involved in production. Gross ratio is a profitability ratio that measures the overall success of the farm. The lower the ratio the higher the returns per naira. Based on the estimated gross margins, net farm incomes and the gross ratios, all the livestock enterprises in the area were profitable. Broiler/layer enterprise was the most profitable enterprise with gross margin and net farm income of ₦981997.92 and ₦892718.85 respectively, followed by broiler enterprise with gross margin and net farm income of ₦932881.12 and ₦845619.22 respectively, while sheep/goat enterprise and others were the least profitable livestock enterprises with gross margin and net farm income of ₦570227.95,

₦626811.34, respectively. However, the computed gross ratios revealed that pig/broiler was the most profitable livestock enterprises with gross ratio of 0.30. This implies that only 30% of the total revenue was required to cover the total cost of production in the study area. According to Olukosi and Erhabor (2008), a less than one gross ratio is desirable for any farm business: The lower the ratio, the higher the return per naira invested. The profitability of livestock enterprises in this study is similar to those obtained from the studies carried out by Bamiro *et al.* (2015), Nyong, and Nweze., 2012); Jacob (2019) and Adewumi, Tanko, Ibrahim and Yisa (2021) on optimum livestock production plans among farmers in the Southwest, Niger and Kwara States Nigeria, respectively, that report livestock enterprise as a profitable farm venture. The result of the costs and returns analysis for each livestock enterprises undertaken by farmers in Agbani, Enugu State is presented in Table 4.2.

Table 4.2: Cost and Return Analysis of Livestock Enterprises Undertaken by the Farmers in Agbani

Livestock Enterprises	Average amount (Naira per tropical livestock unit- TLU)						
	TVC	TFC	TC	TR	GM	NFI	GR
Pig	304430.82	89109.67	393540.49	1128055.16	823624.34	734514.67	0.35
Broiler	308361.94	86217.25	394579.19	1177998.24	869636.30	783419.05	0.33
Layers	322318.47	88726.65	411045.12	1267480.57	945162.10	856435.45	0.32
Broilers/Layers	386038.59	92871.82	478910.41	1357144.53	971105.94	878234.12	0.35
Sheep/Goat	90957.39	43163.11	134120.50	518699.12	427741.73	384578.62	0.26
Pig + poultry	297756.40	87261.15	385017.55	1096309.78	798553.38	711292.23	0.35
Goat/Sheep+ Poultry	153922.63	69096.70	223019.33	723194.41	569271.78	500175.08	0.31
Broiler + layer	+309481.00	92178.10	401659.10	1236220.44	926739.44	834561.34	0.33

turkey

Note: TVC = Total variable Cost; TFC = Total Fixed Cost; TC = Total Cost; TR = Total Revenue; GM = Gross Margin; NFI = Net Farm Income and GR = Gross Ratio

Based on the estimated gross margins, net farm incomes and the gross ratios, all the livestock enterprises in the

area were profitable. Broiler/layer enterprise was the most profitable with highest gross margin and net farm

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income of ₦971105.94 and ₦878234.12 respectively followed by layer enterprise with gross margin and net farm income of ₦945162.10 and ₦856435.45 respectively, while sheep/goat and Pig + poultry enterprise is the least profitable livestock enterprise with gross margin and net farm income of ₦427741.73, ₦384578.62 respectively. However, the computed gross ratios revealed that sheep/goat was the most profitable livestock enterprise with the gross ratio of 0.26. This implies that only 26% of the total revenue was required to cover the total cost of production in the study area. This is also in agreement with the assertion of Nyong, and Nweze., 2012); Olukosi and Erhabor (2008) that a less than one gross ratio is desirable for any farm business: The lower the ratio, the higher the return per naira invested.

The profitability of livestock enterprises in the study is in line with the reports of Bamiro *et al.* (2015), Jacob

(2019) and Adewumi *et al.* (2021) ; Nyong, and Nweze., 2012) that livestock enterprise is a profitable farm enterprise in Southwest, Niger and Kwara States Nigeria, respectively. According to their various profitability analyses conducted across the combinations shows that it is more profitable to combine two different livestock in order to maximize profit. In terms of gross margin and net farm income, poultry/piggery production recorded the highest value in each category, followed by poultry/fishery and the least is recorded by sole poultry enterprise. The profitability of integrated and non-integrated livestock enterprises is limited by high cost of production in which the feed cost constitutes the lion’s share. The result of the costs and returns analysis for each livestock enterprises undertaken by farmers in Udi, Enugu State is presented in Table 4.3.

Table 4.3: Cost and Return Analysis of Livestock Enterprises Undertaken by the Farmers in Udi

Livestock Enterprises	Average amount (Naira per tropical livestock unit- TLU)						
	TVC	TFC	TC	TR	GM	NFI	GR
Pig	240837.56	81027.67	321865.23	909016.35	668178.78	587151.12	0.35
Broiler	322926.23	75420.23	398346.46	1062867.04	739940.81	664520.58	0.37
Layers	315111.49	79248.65	394360.14	1027768.64	712657.15	633408.50	0.38
Broilers/Layers	333559.08	83419.26	416978.34	1032047.59	698488.51	615069.25	0.40
Sheep/Goat	356638.97	78342.34	434981.31	1150600.53	793961.56	715619.22	0.38
Pig + poultry	234470.43	86627.82	321098.25	902291.88	667821.45	581193.63	0.36
Goat/Sheep+	232454.72	74109.37	306264.09	816487.61	584032.89	510223.52	0.38
Poultry							
Broiler + layer	128620.87	61023.01	189643.88	611020.06	482399.19	421376.18	0.31
turkey							

Note: TVC = Total variable Cost; TFC = Total Fixed Cost; TC = Total Cost; TR = Total Revenue; GM = Gross Margin; NFI = Net Farm Income and GR = Gross Ratio

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Based on the estimated gross margins, net farm incomes and the gross ratios, all the livestock enterprises in the area were profitable. Sheep/goat enterprise was the most profitable with highest gross margin and net farm income of ₦793961.56 and ₦715619.22 respectively followed by broiler enterprise with gross margin and net farm income of ₦739940.81 and ₦664520.58 respectively, while, turkey enterprise was the least profitable livestock enterprises with gross margin and net farm income of ₦482399.19 and ₦421376.18. The computed gross ratios revealed that broiler/layer/turkey was the most profitable livestock enterprise with the gross ratio of 0.31 while turkey enterprise was the least profitable enterprise with gross ratio of 0.4. This implies that only 31% of the

total revenue was required to cover the total cost of production in the study area. This is also in agreement with the assertion of Olukosi and Erhabor (2008) that a less than one gross ratio is desirable for any farm business: The lower the ratio, the higher the return per naira invested. The profitability of livestock enterprises in this study is also in line with the reports of Nyong, and Nweze, (2012); Bamiro *et al.* (2015), Jacob (2019) and Adewumi *et al.* (2021) that livestock enterprise is a profitable farm enterprise in Southwest, Niger and Kwara States Nigeria, respectively. The result of the costs and returns analysis for each livestock enterprises undertaken by farmers in Enugu Agricultural Zone, Enugu State is presented in Table 4.4.

Table 4.4: Cost and Return Analysis of Livestock Enterprises Undertaken by the Farmers in Enugu

Livestock Enterprises	Average amount (Naira per tropical livestock unit- TLU)						
	TVC	TFC	TC	TR	GM	NFI	GR
Pig	391800.36	91312.09	483112.45	1417922.66	1026121.64	934810.21	0.34
Broiler	225616.32	84728.78	310345.10	1005166.23	779550	694821.13	0.31
Layers	234823.59	86723.12	321546.71	1031680.62	796857.03	710133.91	0.31
Broilers/Layers	278097.77	87271.33	365369.04	1100290.38	822192.61	734921.34	0.33
Sheep/Goat	135141.03	61982.46	197123.49	655992.99	520851.96	458869.50	0.30
Pig + poultry	359218.35	93172.87	452391.22	1287019.66	927801.31	834628.44	0.35
Goat/Sheep+ Poultry	236307.44	78261.91	314569.35	1008389.55	772082.11	693820.20	0.31
Broiler + layer + turkey	510971.38	92183.72	603155.10	1596996.77	1086025.39	993841.67	0.38

Note: TVC = Total variable Cost; TFC = Total Fixed Cost; TC = Total Cost; TR = Total Revenue; GM = Gross Margin; NFI = Net Farm Income and GR = Gross Ratio

Based on the estimated gross margins, net farm incomes and the gross ratios, all the livestock enterprises in the area were profitable. Broiler/layer/turkey enterprise was the most

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profitable with highest gross margin and net farm income of ₦1086025.39 and ₦993841.67 respectively, followed by pig enterprise with gross margin and net farm income of ₦1026121.64 and ₦934810.21 respectively. Sheep/goat enterprise was the least profitable livestock enterprises with gross margin and net farm income of ₦520851.96 and ₦458869.50 respectively. The computed gross ratios revealed that sheep/goat was the most profitable livestock enterprise with the gross ratio of 0.30 while broiler/layer/turkey was the least profitable enterprise with gross ratio of 0.38. This implies that only 30% of the total revenue was required to cover the total cost of production in the study area. This is also in agreement with the assertion of Olukosi and Erhabor (2008) that a less than one gross ratio is desirable for any farm business: The lower the ratio, the higher the return

per naira invested. The profitability of livestock enterprises in the study is in line with the reports of Bamiro *et al.* (2015), Jacob (2019); Nyong, and Nweze., 2012) and Adewumi *et al.* (2021) that livestock enterprise is a profitable farm enterprise in Southwest, Niger and Kwara States Nigeria, respectively. According to their various profitability analyses conducted across the combinations shows that it is more profitable to combine two different livestock in order to maximize profit. In terms of gross margin and net farm income, poultry/piggery production recorded the highest value in each category, followed by poultry/fishery and the least is recorded by sole poultry enterprise. The result of the costs and returns analysis for each livestock enterprises undertaken by farmers in Enugu State, Nigeria is presented in Table 4.5

Table 4.5: Costs and Returns Analysis of Livestock Enterprises Undertaken by the Farmers in Enugu State, Nigeria (Pooled)

Livestock Enterprises	Average amount (Naira per tropical livestock unit- TLU)						
	TVC	TFC	TC	TR	GM	NFI	GR
Pig	292274.10	83637.71	375911.80	1096208.00	803934.10	720296.60	0.34
Broiler	297550.90	83407.04	380958.00	1128053.00	830502.10	747095.00	0.34
Layers	278087.80	78183.67	356281.40	1062979.00	784881.00	706697.30	0.33
Broilers/Layers	337006.70	88210.37	425217.10	1205453.00	868446.20	780235.90	0.35
Sheep/Goat	198170.00	58166.57	256336.50	776365.80	578195.80	520029.20	0.32
Pig + broiler	290617.60	84535.99	375153.50	1104505.40	813887.40	729351.40	0.34
Goat/Sheep+ broiler	222156.10	72409.56	294490.60	893318.40	671162.30	598827.80	0.33
Broiler + layer	+316850.70	82248.83	399099.60	1168072.00	851220.90	768972.10	0.34
turkey							

Note: TVC = Total variable Cost; TFC = Total Fixed Cost; TC = Total Cost; TR = Total Revenue; GM = Gross Margin; NFI = Net Farm Income and GR = Gross Ratio

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Based on the estimated gross margins, net farm incomes and the gross ratios, all the livestock enterprises in the area were profitable. Broiler/layer/ enterprise was the most profitable with highest gross margin and net farm income of ₦868446.20 and ₦780235.90 respectively, followed by broiler/layer/turkey enterprise with gross margin and net farm income of ₦1026121.64 and ₦934810.21 respectively. Sheep/goat enterprise was the least profitable livestock enterprises with gross margin and net farm income of ₦578195.80 and ₦520029.20 respectively. The computed gross ratios revealed that sheep/goat was the most profitable livestock enterprise with the gross ratio of 0.32 while broiler/layer/ was the least profitable enterprise with gross ratio of 0.35. This implies that only 32% of the total revenue was required to cover the total cost of production in the study area. This is also in agreement with the assertion of Olukosi and Erhabor (2008) that a less than one gross ratio is desirable for any farm business: The lower the ratio, the higher the return per naira invested. The profitability of livestock enterprises in the study is in line with the reports of Bamiro *et al.* (2015), Jacob (2019); Nyong, and Nweze, (2012) and Adewumi *et al.* (2021) that livestock enterprise is a profitable farm enterprise in Southwest, Niger and Kwara States Nigeria, respectively. According to their various profitability analyses conducted across the combinations shows that it is more profitable to combine two different livestock in order to maximize profit. In terms of gross margin and net farm income, poultry/piggery production recorded the highest value in each category, followed by poultry/fishery and the least is recorded by sole poultry enterprise.

Conclusion and Recommendations: The study concluded that all the enterprises were profitable in all the agricultural zones including the pooled in Enugu State despite the constraints to effective and efficient production faced by the poultry farmers. The farmers were not profit efficient. Livestock farming

experience and access to extension services increase the farmers' profitability in the enterprise significantly while capital, costs of labour and feeds significantly reduce it. The following recommendations were made: Farmers should reallocate their resources to attain profitability; Government should establish agricultural banks close to the farmers with minimum (single-digit) interest rate and as well help the livestock farmers in stabilizing the price and create conducive market environment most especially during the festive periods and also introduce policies that will enhance credit access to farmers in the study area given that the availability of capital reduces risk aversion, concerted efforts should be made by government to facilitate credit access by livestock farmers from the financial institutions which geared towards increased agricultural productivity among farmers.; and Competent extension agents should be employed to visit and enlighten livestock farmers on the technicality of farming processes and how they can formulate feeds for their livestock. This will not only enhance the skills of the farmers but also create employment opportunity mainly to the youth and profoundly increase their incomes.

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