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Economic Analysis of Feed Users among Livestock Farmers in Afijio Local Government Area of Oyo State, Nigeria.

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Abstract - Livestock production is an important component of Nigeria agricultural sector. The potential contribution of this sub-sector depends on the efficient use of the feeds which constitute the larger percentage of the variable cost. This study was conducted to examine the economic analysis of feed users among livestock farmers in Afijio Local Government Area of Oyo State. Random sampling technique was used to select 80 respondents for the study. Primary data were collected with the aid of well-structured questionnaire. The information was collected on socioeconomic characteristics and relevant variables. The collected data were analysed using descriptive statistics and Ordinary Least Square (OLS) regression and budgetary techniques. Results of the study showed that the respondents were small scale farmers, Majority were male, middle-aged people and high-income earners with long time production experience. The estimated average farm income was ₦782, 611 while the returns on investment is 1.97. This Indicate that everyone naira invested by livestock feed users there is gain of 97 kobo. Hence, the enterprise is profitable. The regression result showed that the coefficient of monogastric stock size was positive and significant at 1% level of significance as expected, the ruminant stock size, transportation cost and monthly utility which were all not significant at all levels. The poultry stock size, labour and feed quantity were negative and significant at 1%, 5% and 10% levels of significance respectively. The study recommends a policy that will facilitate access to capital by livestock farmers to increase the stock size and access to inputs.

Keywords: budgetary techniques, feed users, income, livestock, stock size

1. Introduction

Globally, agriculture provides a livelihood for more than any other industry. Growth in agricultural production and productivity is needed to raise rural incomes, support the increasing numbers dependent on the industry and meet the food and raw material needs of the faster growing urban populations. Agriculture has a key role in reducing poverty since most of the world's poor live in rural areas and are largely dependent on agriculture either livestock or crop production. Livestock production is an important component of Nigeria agricultural sector which is dependent on crops for survival and provides over half of the value of global agricultural output and one-third in developing countries. Livestock constitutes all animals kept by man for food and benefits accrued from them. By this statement, livestock would include poultry birds, pig, sheep, cattle, goat etc. However, the major importance of livestock is that they supply man with meat, eggs and milk that provide us with balanced proteins and by-products from livestock are economically important parts of animal agricultural business. It was observed that the current acute shortage of animal protein in Nigeria and rapidly increasing demand for livestock product partly be alleviated through poultry and piggery production. However, poultry are regarded as a means of livelihood and a way of achieving a certain level of economic independence. Apart from their rate of reproduction, poultry and pig are characterized by the efficiency of nutrient transformation in high quality animal protein (FAO, 2011). To provide animal protein for people, farmers face the problems of increasing cost of raw-materials, inadequate and poor quality of feedstuff to sustain animal production. Despite the enormous natural and human resources at its disposal, Nigeria remains among the least consumers of animal protein in Africa (Egbunike, 1997 and Lamorde, 1998). The population of poultry in Nigeria is over 130 million birds and appears more advanced than other livestock with one million cattle, sheep, pigs and donkeys respectively (Igene, 1997). Bashar *et al*., (2010) claimed that livestock production in Nigeria as well as other warm climate country has a high priority rating compared with other type of livestock because, poultry has better

energy and protein conversion ratio and that net return on investment are relatively high. Livestock production especially poultry has been identified as a means of ensuring sustainable family income. Poultry can be established with minimum capital and as a side project (Sani *et al*., 2000). Moreover, they can find for themselves on free range without much care (Lawal *et al.,* 2009).

Feeding is the most important part of livestock management which constitutes the dominant input in animal production ranging from 65-75% of the total cost of production and greatly influences the performance and population of these animals in which in the long-run affects the profitability of the livestock business. Similarly, feed ingredient and animal product are both direct and obvious. It has been reported that conventional feedstuff is very expensive and scarce, the high cost and scarcity derived from crippling realities that are characteristic of third world developing economic (Esonu *et al*., 2001; 2002; 2004). In Nigeria, the greatest proportional cost in livestock production is expended on animal feeding stuffs. Feed cost represent over 70% of the cost of producing intensive livestock enterprises, accounting for between 75% and 80% in swine production and over 70% in Egg and broiler production. Rapid expansion and success of the livestock industry therefore depends largely upon the availability and cheap compound feeds (Apantaku *et al.,* 2006). According to the research undertaken since 1930s on the ways of enhancing feed efficiency and improved growth rate of livestock yields, trials have been done using pelleted and mash feed to find out the most efficient form of feed that yields high growth rate and reduced production cost. Mash feed is obtained by grinding feed ingredients using a hammer mill into fine particles. Whereas, pelleted feed is that form of feed that has been grinded and then compressed into pellet. It was shown that pelleted feeds improve feed efficiency, but it is not clear whether there is a significant impact on profitability (McDonald; 2004). Studies on the effect of feed form between mash and pellets on livestock performance most especially broilers have been carried out on improving feed intake using mash and pelleted feeds. It was observed that feed intake increased as particle size increased resulting in increased growth of birds (Mutetwa; 2001). They concluded that pelleted feed is consumed readily and easily than mash feed, mash feed tends to stick to the inside of the birds' beak resulting in a fall in a feed intake and consequently reduced rate of growth (Mcdonald; 2004). It was also reported that feed intake is stimulated by granulation of feed, birds fed on pellets consumed their feed in a shorted time than birds fed on mash. According to Hoffman, (2005), it was shown that mash was the cheapest method of feeding compounded rations when considered in terms of price per tonne. It was also shown that pelleted feeds resulted in 7% increase in revenue compared to mash feeds (Banerjee; 2005). Analysis of economic potential in production and the use of resources remained an important subject of empirical investigation particularly in developing economies where majority of the farmers are resource-poor (Omolehin *et al*., 2020). Hence, the study specifically describes the socioeconomic characteristics of livestock feed users and evaluates the cost and returns in livestock production in the study area.

2. Methodology
2.1. The study area
The study was carried out in Afijo local government area of Oyo State. The State was created by the Federal Military Government of Nigeria on the 18th July, 1989. Afijo Local Government Area was carved out of the old Oyo local government area, Oyo West, Oyo East and Iwo local government of Osun State. From 2016 population census figures of Afijio Local Government area was 185,700 and towns under the Local Government area are Aawe, Akinmoorin, Fiditi, Ilora, Jobele, Iware, Imini and Ore lope. The Local Government area was subdivided into ten wards and was boarded in the north by Oyo North Local Government area, in the South by Akinyele Local Government area, in the West by the Iseyin Local Government area and on the East by the Iwo Local Government area occupied a loud area of about 800 squares kilometres. The indigenes are mostly farmers who had taken the advantage of vast agricultural land that favours the cultivation of food crops such as cassava, maize, guinea corn, yam, cowpea, soya beans, plantain, banana, tree crops and other cash crops like kolanut and oil palm trees. Livestock that was raised and found in this area are poultry birds, piggery, sheep, goat, rabbit, and fishery. Afijio has the reputation of having the most developed livestock farming in Oyo state (NPC, 2016).

2.2. Sampling technique and data collection

Random sampling technique was used to select 80 livestock farmers (feed users) in the study area. Primary data were collected using a well-structured questionnaire. The information was collected on the socioeconomic characteristics of the livestock farmers (Age, education, farming experience, household size, credit availability, gender, marital status, types of feeds and factors influencing livestock production).

2.3. Method of data analysis

Data were analysed using descriptive statistics such as frequency count and percentages. Ordinary Least Square Regression was used to identify factors influencing livestock production. Budgetary analysis was constructed to estimate the production cost, revenue and gross margin accruable to the livestock farmers. The equation used in estimating cost and returns was defined below;

GM = TR-TC

TC = TTC+TVC

NP = TR-TC

Where: TC = Total Cost, TFC = Total Fixed Cost, TVC = Total Variable Cost

GM = Gross Margin, TR = Total Revenue, NP = Net Profit

Regression analysis were carried out to know the dependent and independent variables which were set into the production as thus.

$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, \mu)$

Y = Quantity of livestock (kg)

X_1 = feed quantity (kg)

X_2 = Ruminant stock size (number)

X_3 = Monogastric stock size (number)

X_4 = poultry stock (number)

X_5 = labour in man day

X_6 = Transport cost (Naira)

X_7 = Monthly Utility (Naira)

X_8 = Total revenue (Naira)

μ = Error term

The Linear equation in the explicit form is: -

$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \beta_7X_7 + \beta_8X_8 + \mu$

3. Results and Discussion

The result of the analysis in Table 1 below showed that most of the respondents were male (82.5%) while only 17.5% were female. This indicated that males dominate livestock production in the study area. Only 2.5% of the respondents were above 70 years old revealing the absence of old, (97.5%) were young and little middle age individuals which are less than 70 years old are known to be active to new ideas in livestock rearing and innovative. Majority of the livestock farmers (71.25%) were married, 15% were widowed and 13.75% were single. This indicated that married livestock farmers are stable in farming. About (83.75%) had tertiary education, 15% attended secondary school and 1.25% had primary education. This revealed that farmers had educational knowledge and skills with little formal education. 51.25% of the respondents indicated that livestock farmers had been in the practice rearing of animals between 11-20 yrs., 33.75% had been rearing livestock between 21-30 yrs. and 15% had been rearing livestock above 30 yrs. The mean years of livestock production experience was 16 yrs. This reveal that livestock production is not newly introduced profession of the people in the study area. Credit facilities were enjoyed since all the respondents were active members of the cooperative society. This is due to the presence of micro-financial institution in the study area. Majority of the respondents were engaged in intensive housing management system. 70% of the respondents were engaged in the raising of poultry birds, 15% were engaged in the raising of Ruminant animals and 15% were engaged in Non-ruminant animal. This revealed that those engaged in poultry birds make more profit and there is more market demand for their poultry birds than the Ruminant and Non-ruminant animals.

Table 1: Socioeconomic characteristics of the respondents in the study area

Variables	Frequency	Percentage
Age		
< 70	78	97.5
≥ 70	2	2.5
Gender		
Male	66	82.5
Female	14	17.5
Marital Status		
Single	11	13.75
Married	57	17.25
Widowed	12	15
Education		
Primary	1	1.25
Secondary	12	15
Tertiary	67	83.75
Faming experience		
11-20	41	51.25
21-30	27	33.75
>30	12	15
Membership of cooperative		
Yes	80	100
No	Nil	Nil
Housing Management		
Intensive	80	100
Semi-intensive	Nil	Nil
Extensive	Nil	Nil
Types of Livestock		
Poultry birds	56	70
Ruminant animals	12	15
Non-ruminant animals	12	15

3.1. Cost and Returns in poultry production

The results below showed the cost and returns in poultry production. The estimated variable cost was ₦795,001.00. The total fixed cost was ₦15,230.00. The estimated revenue was ₦1,592,859. The net profit was ₦782,611.00. Judging from the value of net profit obtained and the value of return on investment, it is seen that feed production among livestock farmers in the study area is highly profitable.

Π = TR-TC

TC = TFC+TVC

Where,

Π = profit

TR = Total revenue

TC = Total Cost

TFC = Total Fixed Cost

TVC = Total variable cost

Total Variable Cost = ₦795,001.00

Total Fixed Cost = ₦15,230.00

Total Cost = TVC+TFC
        =795,018+15230
    TC = ₦810,248.00
Total Revenue = ₦1,592,859
        Profit = TR-TC
            = ₦1,592,859-#810,248
            = ₦82,611.00
Benefit Cost Ratio = Total Revenue
                    Total Cost
        BCR = 1592859   = 1.97
                810248

Hence, judging from the value of net profit obtained and the value of BCR, it is seen that feed production among livestock farmers in the study area is highly profitable. It means for every one Naira (₦1.00), they will make a profit of 97 kobo.

3.2. Regression results

The result in Table 2 below showed that the significant variables include feed quantity, Monogastric stock size, poultry stock size, labour in Man-days and the total revenue except ruminant stock size, transportation cost, monthly utility and total revenue which were all not significance (i.e. 1%, 5% and 10%). Only the Monogastric stock size had a direct and significant relationship with the feed cost and it was significant at 1% level of significance. By implication it means that as the size of the monogastric stock increases, the amount spent on their feed decreases from outside the farm. The poultry stock size had a negative (inverse) and significant at 1% level of significance. This implies, the larger the poultry stock, the lesser the amount of money spent on buying outside feed as the farmers themselves can now decide to compound their own feed from crop residues. The labour in man days has an inverse relationship with the feed cost and it was significant at 5% level of significance, by implication it means that the larger the amount of resources spent on sourcing for feed from outside, the lesser will be labour amount required to compound feed within the farm setting. Feed quantity and total revenue both had negative with the feed costs (cost incurred on feeds from outside the farm setting) and were both significance. By implication, the greater the amount of feed costs for feed compounded outside the farms, the lower the feed quality that the farmers will be able to produce intentionally, and the revenue of the farms will be reduced as the bulk of their income is spent on sourcing for feed outside the farm. From the regression result under the model summary, an adjusted R square value of 0.234 indicated that 23.4% of the explained variable in the output of the farmers was due to the overall effect of the independent variables specified in the model (X_1-X_8). While the rest 76.6 unexplained variation in the right output may be due to certain variable of the interest not specified in the model but are resident in the error term. From the ANOVA selection of the regression result, we have the decision rule, if $F_{cal} > F_{tab}$ reject H_o and accept H_a which state that there is significant relationship between cost of feeds bought outside the farmers' farms and their production factors or variables and verse-versa.

$F_{tab} = Fσ(v_1 v_2)$

σ = degree of significant; v_1 = degree of freedom for regression; v_2 = degree of freedom for residual.

$F_{tab} = F_{0.05}(8.71) = 2.06$

$F_{cal} = 4.025$

From the above $F_{cal} > F_{tab}$ reject H_o and accept H_a, it is concluded that there is significant relationship between cost of feed bought outside the farmers farm and their production factors or variables.

Table 2: Factors influencing livestock production

Variables	Co-efficient	T-value	Significant
Constant	306172.51	3.678	
Feed quantity	-5863.714	-1.875	10%
Ruminant stock size	64.661	.169	NS
Monogastric stock size	74.724	2.737	1%
Poultry stock size	-116.524	-3.003	1%

Labour in Man day	-1080.265	-2.049	5%
Transportation cost	-0.003	-.416	NS
Monthly Utility	1.164	.421	NS
Total Revenue	-24.484	-1.825	10%

4. Conclusion and Recommendations

In conclusion, efficient production of high quality feed in Nigeria can increase the profitability of livestock production and bring solution to the problems and difficulties encountered in livestock feed production. The following recommendations will enhance and ameliorate difficulties militating the production of livestock feed production in Nigeria.

i. There is need for a regular supply of quality feed at a reasonable price to livestock farmers which will help to alleviate the feed problems faced by the farmers.

ii. There is need for provision of funds through government for the livestock farmers to purchase battery cages, erect building and to expand the scale of their business.

iii. There is also the need for improved livestock management and adequate supply of labour of affordable prices.

iv. Livestock farmers need to be educated to purchase conventional feeds and feed ingredient rather than feeding their livestock on waste or unconventional feeds because conventional feeds have special diets which are constituted in various proportion by essential and non-essential nutrients which are required for the growth of the livestock.

v. Finally, the utilization of extension service in agricultural ministry should be employed to create awareness and research into feeds formulation and popularizing the use of conventional or compound feeds in various classes of livestock other than poultry to improve the profitability of livestock production in Nigeria.

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