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Economic Analysis of Small Scale Cow Fattening Enterprise in Bama Local Government Area of Borno State, Nigeria

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Abstract
The study investigated the economics of small-scale cow fattening enterprise in Bama LGA of Borno State. Random sampling was used to select 45 respondents from two districts that have large number of beef fattening enterprise. The analytical tools employed were descriptive statistics and net margin analysis. The result shows that the average age of the respondents was 41 years. The inputs used for cow fattening were feeder cow, feed, drugs/vaccines, labour, water and potash/salt. The net margin was ₦40, 528.58 per cow that is, for every one naira invested in cow fattening business, 67 kobo was realized as net margin. The study shows that small scale cow fattening enterprise is profitable.

Key words: Economic Analysis, Small Scale, Cow Fattening Enterprise

INTRODUCTION

Nigeria's livestock resources consist of 14 million cattle, 34 million goats, 22 million sheep, 100 million poultry, 1 million horses and donkey as well as negligible number of camels (Umar, 2007). The livestock plays an indispensable role in the traditional agriculture and largely subsistence economy, the sub-sector contributes about 15.3% of the total agricultural sector (Mbanasor, 2000). The sector is undergoing a massive transformation fuelled by high demand for meat, which is likely to double in the near future, the major forces behind this, is the combination of population growth, urbanization and income growth (FAO/IAEA, 2006).

In the recent past, there is a greater emphasis on sustainable beef production through backyard beef fattening which has its focus on the long-term health of the environment while maintaining the economic viability of the farm and addressing consumers' concern about beef they eat (Fanatico *et al*., 1999). Cow fattening simply refers to the preparation of the cattle for marketing (Jean, 1993; Uza *et al.*, 1999). People fatten cow for the same reason that other men operate factories, namely to make a profit by converting raw material which are of low value in their natural form into a product for which there is a good demand and sell for better prices (Neumann, 1977).

In Nigeria, the common breeds used in the fattening program include Red Bororo, Ndama, Rahaji, Muturu, Sokoto Gudali, Abore and Mbala (Umar, 2007). These are reared mostly in the tropical and sub-tropical regions of the country for beef production. They have a body characterized by great depth and width; and they are bred primarily for the production of meat under special conditions. The breeds of cattle carry considerable muscle especially around the lion. These classes of animal possess a greater efficiency of converting poor quality forage into a good quality

protein (meat). The height of the animal has been found to be a useful indicator of animal performance in the feedlot. Taller animals generally grow more quickly and lay down less fat than shorter ones (McKiernan *et al*., 1998).

Beef cattle trade provides the largest livestock market in the country. Millions of Nigerians made their livelihood from the beef enterprises as producer, marketers and transporters. Others, as processors of beef products, feed millers, veterinary services, and, in agricultural machineries. It also generates a lot of revenue to the government through various forms of taxations.

Inspite of all the contributions, the livestock sub-sector is a relatively neglected part of agriculture with its supporting services collapsing well ahead of others (Oni, 2006). Though Nigeria plays a vital role in the livestock economy of Africa, her livestock production is not enough to meet the domestic consumption requirement. The total supply of livestock products fall short of the overall demand. In some cases, the domestic production and noted importations are together still not enough to meet more than 60% of the actual demand (Mbanasor, 2000).

Oni (2006) reported that the economic viability of cow fattening enterprises is not in doubt. This is because raw materials needed for the venture can be sourced at ease. Also, the production technology is simple and the man power requirement can be met with family labour. However, there appears to be a major constraint to the improvement of the local beef fattening enterprises and that is finance (Jean, 1993). The most devastating problem confronting the African farmers is accessibility to capital. According to Onocheyo (1999), the greatest need for present day farmers in Nigeria is capital for modernizations and expanding their operations. The small farmer with his small land, lack of collateral has made it almost impossible for him to be able to access credit. Also, there are no documented studies in Borno State to show the profitability of beef fattening. This study is an attempt to investigate the profitability of cow fattening enterprise in the study area.

The objectives of the study are to: identify the socio-economic characteristics of small scale cow fattening; determine the average weight and cost of cows before and after fattening; compare the inputs and outputs of cow fattening venture and determine the profitability of cow fattening enterprise.

METHODOLOGY

Study Area

Bama Local Government Area is the largest Local Government in Borno State following Maiduguri metropolitan and Jere Local Government Area. It is located between latitudes 11^0 15'N and 11^0 50'N and between longitudes 13^0 24'E and 14^0 41'E. It covers an area of about 6,176 km^2 (Ehiemere, 2003). It has a total population of about 269,986 people (NPC, 2006).

The climatic condition is semi-arid type characterized by long dry season and short raining season. The dry season lasts from October to June, while the rainy season last from July to September with a mean annual rainfall of 650 mm/annum.

The temperature is high for the greater part of the year within the range of 24^0- 34^0C. Relative humidity is as low as 49% and evaporation is 203mm per annum (Ehiemere, 2003).

The vegetation of the area is Sahel and Sudan savannah. The main occupation of the people is farming, both crop and animal enterprises including cattle fattening. The dominant crops that are cultivated include maize, millet, sorghum, rice, groundnut and cowpea.

Sampling Procedure

Random sampling technique was used to select 45 respondents from two districts that have a relatively large number of beef fattening enterprise. The list was collected from Local Union and the Nigerian Agricultural Cooperative and Rural Development Bank. Only farmers who have been engaged in beef fattening for more than three years were considered and only those who fattened between 1 and 8 cows at a time were regarded as small scale. The total number was 450 which formed the sampling frame. From this population, random sampling was used to select 10%, which came to 45 farmers.

Data Collection Method

Primary data were collected for this study. Interview method of data collection was used. The information gathered include those on socio-economic variables of the sampled fatteners, cost of inputs used in beef fattening, cost of cattle before and after fattening, weight of cattle before and after fattening, values of feed, drug and labour. Other costs include cost of water, feeders, drinkers, rake, wheel barrow, buckets and other financial parameters like rent on land were calculated. Weight band tape was used to measure the live-weight of the animals before and after fattening. Weight band tape is a measuring instrument that is designed to take a live weight of live animal, particularly cattle, pigs, sheep and goats.

In other to eliminate market price imperfection, the weight of the cattle before fattening was used to divide the price of the cattle. The average weight was 292.35kg while the price was ₦40, 000.00. This was done to get the price of a kilogram. This gave us ₦136.82/kg. Similarly, the average weight of cattle after fattening was 688.12kg. To get the price of the cattle after fattening we multiply the weight by the price/kg and this gave us ₦94, 148.58.

The following analytical techniques were used to achieve the objectives of the study. Descriptive statistics such as measures of central tendency like mean, percentages and frequency for objectives 1, 2 and 3, while Net Margin analysis was used to achieve objective 4. Net income is a useful tool in determining the profitability of a firm enterprise when the fixed cost can be calculated. For this study fixed items were depreciated at 20% per year, using straight line depreciation method.

The Net Income (NI) of an enterprise is given as follows:

NI = TI-TVC-D----------(1)

Where TI = Total Income (₦/cow)

NI = Net Income (₦ /cow)
TVC= Total Variable Cost (₦ /cow)
D = Depreciation (₦ /cow)

In computing the total income per head of cow fattened, the following formula by Cevger *et al.,* (2003) was used:

TI = Wb x (PS-Pp) + Ps x (We-Wb)-D ……. (2)

Where; TI and D = as defined in …… (1)

Wb = Average live weight (LW) of a cow at the beginning of fattening in kg
We = Average (LW) of a cow at the end of fattening (kg)
Pp = Average purchase price paid for 1 kg LW of cow to be fatten in ₦.
Ps= Average sales price of 1kg LW of cow at the end of fattening in ₦

RESULTS AND DISCUSSION

Socio-Economic Characteristics of Beef Fatteners

The socio-economic characteristics considered were age, educational qualification, years of experience, duration of fattening by respondents, types of cow preferred for fattening and number of animal fattened by the respondents at a time.

Table 1, shows that 77% of the respondent fatteners were between the ages of 31 and 50 years. The average age of the respondents was 41 years. About 47% of the respondents had Quranic education, while 24% had up to tertiary education. This shows that literate people are going into the fattening business. About 27% of the respondent fatteners had been in the business for over 21 years while 20% have been in the business for between one to five years

Respondent fatteners were asked about the duration of fattening, about 62% said the duration is between 2 to 3 months, while 24% of them said they took 4-5 months to fatten their cows. Questioned further on the number of animals they fattened at a time, 33.3% said that they fatten 2 to 4 cows at a time, 46.7% of them said they fatten 5 to 6 cows at a time. The average number of cows they fatten at a time was 5 cows.

Determination of Average Weight and Cost before Fattening

The average weights and costs presented in Table 2 were arrived at by adding up the weight of the 225 cattle studied and dividing the total by 225 to get the average weight and cost of one cow. Table 2 shows the average weight and cost before fattening.

Table 1 Socio-economic characteristics of respondents

Items	Respondent cattle fatteners Frequency	Percentage
Age in years		
21-30	2	4.4
31-40	18	40.0
41-50	17	37.8
51-60	6	13.3
61 and above	2	4.0
Educational status		
No formal education	1	2.2
Quranic education	21	46.7
Primary education	7	15.7
Secondary education	5	11.1
Tertiary education	11	24.4
Years of experience		
1-5	9	20.0
6-10	5	11.1
16-20	8	17.8
21 and above	12	26.7
Duration of fattening		
2-3 months	28	62.2
4-5 months	11	24.4
6-7 months	4	8.9
Over 7 months	2	4.4
Number of animal fattened		
2-4	15	33.3
5-6	21	46.7
7-8	9	20.0
Total	45	100.0

Source: Field Survey data, 2006

Table 2. Minimum, Maximum and Average Weight and Cost of Cows before fattening

Detail	Weight in kg	Cost in Naira
Minimum	250	25,000.00
Maximum	500	60,000.00
Average	292.3	40,000.00

Source: Field Survey data, 2006

Table 2 shows that the minimum weight of a cow before fattening was 250kg, while the value was ₦25, 000.00. This implies that one kilogram of meat was ₦136.80. On the other hand, the maximum weight of a cow before fattening was 500kg, while the value was ₦60, 000.00. The average weight of cattle before fattening was 292.3kg, while the average cost was N40, 000.00. The minimum, maximum and average weight of cattle after fattening is presented in Table 3. It was discovered that before this study, fatteners do not weigh the cows before and after fattening

Table 3. Minimum, Maximum and Average Weight and Cost of cattle after fattening

Detail	Weight	Value in Naira
Minimum	500	60,000.00
Maximum	750	150,000.00
Average	688.12	94,148.00

Source: Field Survey data, 2006

Table 3 reveals that minimum weight of cattle after fattening was 500kg, while the value was ₦60, 000.00. Similarly, the maximum weight of cattle after fattening was 750kg, while the value was ₦150, 000.00. The average weight of cattle after fattening was 688.12kg, while the average value was ₦94, 148.00.

Inputs Used for Cow Fattening and their Costs

The inputs used for cattle fattening include:

1 *Feeder cow*: This is the most important input used in the fattening program. It also constituted the greatest cost component. It is the biological machine that converts low quality input (feeds) into high quality product (meat). The study reveals that the average cost of feeder cow weighing about 292.35kg was about ₦40, 000.00.

2. *Feed*: The component of feed used in fattening include: roughages (millet, sorghum and maize), cowpea stover, groundnut haulm, cotton seed lint and chaff

(dusa). They were mixed in various proportions and fed to the animals on the basis of two rations per day. At the time of this study the average cost of feed mixture used in cow fattening was ₦12, 500.00 per cow.

3. *Drugs/vaccines*: This is another important input used for cow fattening. Anti-biotics are typically viewed as tool for improving the health status of cattle (Mckinley, and Parish, 2007). The common drugs/medicine that were administered to animals during the fattening program include invermectin injection, teramycin/oxytetramycin L.A. injection, B Complex injection , multivitamin injection, vbarminth tabs and vitamix power. The study reveals that the total cost of drugs and vaccines including veterinary services per cow for an average of three months was ₦2, 200.00.

4. *Labour*: The labour used for cow fattening program comprises hired labour, family labour and self-labour. Since farmers fattened an average of five cows per batch, the average weekly cost of labour per head of cow was estimated as ₦250.00 and the three months is ₦1600.00

5. *Water*: The study reveals that the daily intake by the animals depends on weather condition. The animals take in more water during the hot season. The result of the study shows that the average daily intake of water by animals was 20 litres, which is sold for ₦20.00. This gives an average consumption of ₦140.00 per week and ₦1, 680.00 per head of fattened cow for three months.

6. *Potash/salt*: Farmers usually mix dissolve particles of potash with feedlot to improve its palatability and in order to aid digestion. They also provide calcium to strengthen the bones of the animals. According to El-Naga (2000) hydration tends to increase feed intake. The cost of potash/salt use in fattening is about ₦150.00 per cow.

7. *Equipment*: The equipment used in the enterprise includes: feeders, drinkers, rake, spade wheelbarrow and buckets. These fixed items were depreciated at the rate of 20% per year. Using the straight-line depreciation method, the total average cost of equipment used for fattening was valued at ₦990.00 per cow.

Net Income

The average weight of a cow after fattening was 688.12kg and the average price was ₦94, 148.58. The sale of manure was ₦7, 000.00. Therefore, the total revenue from fattened cow was ₦101, 148.58. On the other hand, the average weight of cow before fattening was 292.35kg and the price was ₦40, 000.00. Other variable cost were feed, ₦12, 500.00; drug/vaccine ₦2, 200.00; labour N1 600.00; water ₦1, 680.00; salt/potash ₦150.00; tax N1000.00; transportation ₦300 and miscellaneous ₦200.00. The total variable cost equals ₦19, 630.00. That of fixed cost was as follows: depreciation at 20% per year. Feeder equals ₦200.00, drinkers and rakes ₦20.00, spade ₦30.00, bucket ₦40.00, land rent equals ₦300.00. The Total fixed cost equals ₦990.00 per cow.

Therefore, net income equals ₦40, 528.58. The average rate of returns equal 0.67. That means for every one Naira invested in cattle fattening 67 kobo was realized as net profit.

SUMMARY, CONCLUSION AND RECOMMENDATION

The result of the analysis shows that he average age of the cow fatteners was 41 years, about 96% of the fatteners were married. About 24% of them had tertiary education and the average duration for fattening was 3 months. The average weight and value of a cow before fattening was 292.3kg and ₦40, 000.00 respectively, while the average weight and value after fattening was 688.12kg and ₦94, 148.58 respectively. The net income was ₦ 40, 528.58 and the average rate return per Naira invested is 67 kobo.

Conclusion

From the findings of the study, it could be said that small-scale cow fattening enterprise is a profitable venture. This is because the net return is high and the average rate of return per Naira invested is 67 kobo.

Recommendations

Based on the results of this study the following recommendations are proffered:

a) There is a need for producers to increase the number of cows they fatten at a given period from 5 to 10 because these will double their margin.

b) Farmers should be enlightened on how to access credit in order to increase their capital base to expand their scale of production.

c) There is a need to enlighten fatteners on the importance of weighing their animals at purchase and at regular interval until they are finally disposed.

d) Fatteners should be encouraged to keep regular and proper record of their fattening enterprises.

Table 4: **Average net income per cow fattened**

	₦	₦
Selling price of fattened cow		94,148.58
Sales of manure		7,000.00
Cost of cow before fattening	40,000.00	
Variable Costs		
Feed	12,500.00	
Drug/vaccine	2,200.00	
Labour	1,600.00	
Water	1,680.00	
Salt/potash	150.00	
Tax	1,000.00	
Transportation	300.00	
Miscellaneous	200.00	
Total variable cost	**19,630.00**	
Fixed Cost (Depreciation at 20% per year)		
Feeders	200.00	
Drinkers	200.00	
Rakes	20.00	
Spade	30.00	
Wheelbarrow	200.00	
Bucket	40.00	
Land rent	300.00	
Total Fixed Cost	**990.00**	
Net income	40,528.58	
Total amount	101,148.58	101,148.58

Average Rate of Return per Naira invested is 67 kobo

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