

ECONOMETRICS ANALYSIS OF SEMI INTENSIVE BEEF CATTLE FATTENING IN ADAMAWA STATE, NIGERIA: A CASE STUDY OF YOLA SOUTH LOCAL GOVERNMENT AREA.

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ABSTRACT

A study conducted at the eleven wards of the study area drew seventy seven respondents, seven from each ward to ascertain the input-output relationship and profitability or otherwise of three years semi intensive beef cattle fattening enterprise. Analysis was carried out on sixty respondents whose data were intact till the end of the collection period. Of the four functional forms used, the Cobb Douglass regression analysis gave the best fit and it revealed that the independent variables; feeds (X_2), initial weight (X_1), labour (X_5) and water (X_4) were significant to the dependent variable- the final weight (Y). The regressors in descending order of magnitude were; feeds, initial weight, labour, water, medicaments and utilities. The profitability status revealed a positive negligible average net income of N 1,711.60, thus, profitable, but not commensurate considering the investment duration. Also identified were the marketing routes of the enterprise. Timing, dearth of record keeping and inefficient inputs utilization were the major identified constraints. Policy recommendations on timing periods of glut and disposal, feeds randomization and absolute record keeping are avenues towards accelerated positive net income of the enterprise to attain a lucrative status to farmers.

KEYWORDS: Econometrics analysis, Semi intensive, Beef cattle fattening, Profitability and marketing routes.

INTRODUCTION

The domestication of cattle began some 8,500 years ago in South Eastern Europe, with South Eastern Asia a probable second centre of domestication (WFS, 2004). The world's cattle population as put by Ranjhan (2001) revealed an estimated one billion, two hundred and eighty eight million, six hundred thousand (1,288,600,000) heads. Of these, he postulated that more than one-third (1/3) are found in the tropics. High yielding breeds of zebu cattle are found in high rainfall areas where paddy is the main crop. Similarly in Nigerian context, the bigger and high yielding breeds such as White Fulani, Sokoto gudali, Red bororo are found in the northern part while the smaller and low yielding breeds like Muturu and Ndama are typical of the southern Nigeria. Cattle are source of traction, manure, food, industrial products and employment (FDLPCS, 1991). Cattle and calf marketing generate \$400 Million annually in North Dakota, U.S.A (Corbis and Kevin, 2004).

Record keeping no doubt play an integral part in many respect in the field of Agriculture. It is vital in the areas of planning, evaluation, price formation and many others. Inadequate record keeping is thus, one of the constraints faced by local farmers. Cattle rearers are no exception in the area, this trend however need to be revamped for the industry to have a justifiably estimated picture of production cost components.

This survey was meant to achieve three distinct objectives namely:

i. Analyze the socio-economic attributes of the respondents,

ii. Determine the input-output relationship and profitability or otherwise of the enterprise,
iii. Identify the marketing routes of the enterprise and make policy recommendations with a view to improving the enterprise in the study area.

STUDY SIGNIFICANCE

This inquiry to farmers is an encouragement to curtail production costs and huge revenue drive, to researchers, a stimulant for building up research and to the government, a yardstick for agricultural policy reforms.

METHODOLOGY

Study area

Yola South, one of the twenty one local government areas of Adamawa State is bordered to the north by Yola North, to the west by Demsa, to the south and east by Fufore, and to the north-east and north-west by Girei local government area (Adebayo and Tukur, 1999). The area is on altitude of 185.9M above sea level with an annual rainfall of 958.99mm and temperature fluctuates between 21°C and 43°C (YSLG diary, 2000). The area is predominantly a Fulani settlement. However, the Verre and the Bata are minority ethnic groups in the area. Agricultural activities are highly practiced in the area.

Data collection

Data were collected from the eleven wards in Yola south local government area, namely: Adarawo, Bako, Bole-Yolde pate, Makama A, Makama B,

Mbamba, Mbamoi, Namtari, Ngurore, Toungo and Yolde kofi. In each, purposive sampling technique was employed to draw seven respondents. Bulls averaging three (3) years old were initially valued and weighed. Data were received periodically via home visits for a period of three (3) years before final valuation and weighing. Analysis was conducted on sixty (60) of the respondents whose track of data were intact. The research duration was between January, 2001 and December, 2003.

Analytical techniques

The analytical models formulated for this research were descriptive statistics, gross margin analysis, net income analysis, Cobb-Douglass production function and beta coefficient model. They are as viz:

$$Dt=(P-S)/N$$

Where,

Dt=Depreciation

P=Cost of asset

S=Scrap value

N=Number of useful years

$$GM=TR-TVC$$

Where,

GM=Gross margin

TR=Total revenue

TVC=Total variable cost

$$NI=GM-TFC$$

Where,

NI=Net income

GM=Gross margin

TFC=Total fixed cost

$$\text{Log}Y=\text{Log}b_0+b_1\text{Log}X_1+b_2\text{Log}X_2+b_3\text{Log}X_3+b_4\text{Log}X_4+b_5\text{Log}X_5+E$$

Where,

Y = Final weight (Kg)

X₁= Initial weight (Kg)

X₂= Feeds (Kg)

X₃= Medicaments (N)

X₄=Water (Lt.)

X₅= Labour (N)

X₆= Utilities (N)

b=Coefficients of independent variables

E=Error term

$$Bi^0=Bi (Sxi / Sy)$$

Where,

Bi⁰=Beta coefficient

Bi=Estimated regression coefficient of inputs

Sxi=Standard deviation of the dependent variable

Sy=Standard deviation of the independent variable

DATA ANALYSIS

Socioeconomic attributes of respondents

Table 1 shows majority (80%) of the respondents had the age range 31 and above. The age range 26-30 represented by 20% and no respondent in the 16-25 age range. This may not be unconnected with capital availability, which may be more open to the adults. This concurs with the postulation of Boyes and Melvin (1996), that middle aged class of every society consume less and save more towards investments than the teenage class and the old aged class. The table also

Table 1: Socio-economic attributes of respondents.

Parameter	Frequency	Percentage
Age		
16-25	-	0
26-30	12	20
31 & above	48	80
	60	100
Gender		
Male	54	90
Female	6	10
	60	100
Education		
Religious	30	50
Primary	18	30
Secondary	-	-
Tertiary	12	20
	60	100
Occupation		
Fattening	18	30
Fattening/cropping	24	40
Fattening/trading	6	10
Fattening/civil service	12	20
	60	100
Marital status		
Married	36	60
Never married	18	30
Widowed	6	10
	60	100

presents 90% and 10% as participating percentages for males and females respectively in the business. The low participation of female folk in this agricultural venture is linked to the issue of capital, which the men folk are more accessed to than the females. The situation has to do with the tradition in the study area. They believe that agriculture be left in the hands of the men. Recently there has been a magnificent improvement in women participation in agriculture in the area. It can also be deduced from the table that majority of cattle fattening farmers in the area are people with low level of education. In recent past, farmers with higher educational status showed lack of patronage to the business because they felt it was tedious, labour intensive and an unskilled venture. Nowadays, there is a reversal to that notion, having realized that it is an avenue to save and diversify income. It can be seen also from table 1 di-occupational respondents constitute 70% while mono-occupational respondents were 30%. The di-occupational respondents were accessible to capital accumulation via other avenues of income to support the fattening venture. This diversification avails the di-occupational respondents a security on one end in

Table 2: Production function results

Predictor	coefficient	t-value
Constant	6.3913	16.96
X ₁ (initial weight)	0.4146	1.69***
X ₂ (feeds)	0.9091	1.23***
X ₃ (medicaments)	-0.4916	-1.87
X ₄ (water)	0.0213	2.61*
X ₅ (labour)	0.1310	1.87**
X ₆ (utilities)	-0.1995	-2.48

R² = 87.43% * = p < 0.10
 ** = p < 0.05
 *** = p < 0.01

Table 3: Coefficient and rank of regression

Regressor	Beta coefficient	Rank
X ₁	0.7468	2
X ₂	2.6602	1
X ₃	-0.9525	5
X ₄	0.0127	4
X ₅	0.5843	3
X ₆	-2.7545	6

the quest of other venture failure, contrary to the mono-occupational respondents whose reliance is solely on the fattening venture. Finally the table depicts married respondents as majority (60%), while 30% and 10% were for respondents who never married and widowed respectively. The preponderance of married class may be associated with the large nature of their family size, hence the need to invest in diverse ways, thus, the choice of this venture. The partaking singles do so with the aim of actualizing a particular forecasted project. Widows on inheritance are into beef cattle fattening as a means to foster income flow to render perpetual support to their progenies in schools.

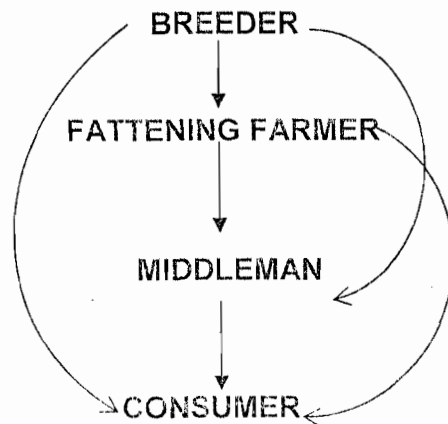
Production function analysis and Profitability

The Cobb-Dougllass production function analysis showed all the coefficients of independent variables except medicaments and utilities as positive indicating their individual contributions to the final weight. The negative sign of medicaments and utilities signifies that additional quantity of medicaments and utilities in the production may not lead to a magnificent increase in final weight of the beef. The coefficient of determination R² was 0.8743, indicating that 87.43% of the final weight is explained by the selected explanatory variables. Elasticities of the independent variables were significantly greater than zero and imply that increase in final weight can be facilitated by employing these factors. Analysis of beta coefficients puts the selected

independent variables in decreasing order of importance as follows: feeds, initial weight, labour, water, medicaments and utilities. The research revealed a positive negligible average net income of N1, 711.60. Going by that and putting into cognizance the duration of investment, the venture is not economically worthwhile for investment. Some economic sanity must however, be put in place to render the semi intensive beef cattle fattening a worthwhile investment in the area, such as cognizance to breed type, health condition of animals at purchase, targeting periods of disposal, adequate record keeping and several others recommended by this research.

Identified marketing routes

The study identified the marketing routes of semi intensive beef cattle fattening in the study area as below:



1. Breeder-Fattening farmer-Middleman-Consumer (BFMC) route: This is the longest of the marketing routes identified. It is a function of the number of fattening farmers and middlemen in the route. The more the number, the higher the disposable price would be. Each participant is out for a dividend; hence disposable price at the end may be at price floor leading to surplus. Boyes and Melvin (1996) attested that price floors are common feature with agricultural products.
2. Breeder-Fattening farmer-Consumer (BFC) route: Here the middlemen are off-the link, depending on number of fattening farmers, but prices may still not be exploitative.
3. Breeder-Middleman-Consumer (BMC) route: This is a bypass to the fattening farmer; as the case may be disposable price may be high or low.
4. Breeder-Consumer (BC) route: This is the shortest of the marketing routes. The disposable price in this context may be at price ceiling leading to shortage owing to non involvement of middlemen.

Note: Chain of middlemen is possible, but chain of fattening farmers is seldom.

IDENTIFIED PROBLEMS AND RECOMMENDATIONS

Production inputs like feeds and water were found to be inefficiently utilized via wastage, which further added up to production cost. It is recommended that fattening farmers should abreast themselves with the practice of quality feed manipulation by randomizing super and inferior feeds to minimize production cost. Also found was the incognizance of the participants to periods of glut whence cattle are generally cheap. A good number of them do not target periods of disposal like festive periods. Farmers should have a reversal change to this trend for the good of the venture. When cattle are to be purchased for fattening purpose, cognizance should be given to the breed type and the health of the animal. Body composition and rate of body transformation depends heavily on the breed type and

health status of the animal. Profitability is sometime unattainable owing to ill estimate of production cost and dearth of record keeping. The bulk amount realized by fattening farmers at termination of the exercise make them assume that they have made profit, which may not be so. Therefore, it is of paramount importance to keep track record of every transaction in the fattening enterprise for effective evaluation of costs and returns. These recommendations could best be interpreted and imparted to the local farmers via the extension agents situated all over.

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