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DETERMINANTS OF PROFITABILITY OF BEEF MARKETING IN SELECTED STATES OF NORTH-WEST, NIGERIA

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ABSTRACT

The objective of this study was to determine the factors influencing the profitability of raw beef and processed beef marketing in the study area. A multi-stage sampling procedure was employed in the selection of the respondents. A sample size of 120 beef marketers (consisting of 60 raw beef marketers and 60 processed beef marketers) was utilized in the study. The study made use of primary data which were obtained through the use of computer-aided personal interview version of survey instrument rather than paper-based questionnaire. Multiple linear regression analysis was used for data analyses. The results showed that the significant determinants of the profitability of raw beef marketing were marketing experience ($p<0.05$), access to credit ($p<0.01$), membership of association ($p<0.05$), market charges ($p<0.1$), cost of labour ($p<0.1$), cost of transportation ($p<0.05$) and purchase cost of beef ($p<0.01$). The significant determinants of the profitability of processed beef marketing were marketing experience ($p<0.01$), access to credit ($p<0.05$), cost of labour ($p<0.01$), cost of processing items ($p<0.05$) and purchase cost of beef ($p<0.01$). Based on the findings of the study, raw beef marketers and processed beef marketers can significantly increase their profit by exploring ways of reducing purchase cost of beef especially through bulk purchase and purchase of live cattle to benefit from economies of scale or integrate backwards into beef cattle farming.

Key Words: Profitability, Raw beef marketers, Processed beef marketers.

INTRODUCTION

Nigeria is the leading livestock producer in Central and West Africa and the country's cattle population is estimated at over 16 million heads, far ahead of Niger (8.7 million), Mali (8.2 million) and Chad (7 million), (Bernard *et al*., 2010). However, a more recent data puts the number of cattle heads as 19.5 million heads (FAOSTAT, 2017). Livestock production in Nigeria had been predominately rural until recently when development in husbandry and breeding for improvement was given prominence.

Beef is considered to be of high importance as a source of protein in diet of most Nigerians and its wide acceptance for human consumption across the diverse ethnic groups in Nigeria makes it a good option for solving the widespread problem of protein malnutrition in Nigeria (Bobola *et al.*, 2015). Beef cattle production has been shown to be inefficient across nomads, agro-pastoralists and ranchers indicating that there is still much opportunity for increased efficiency given the present state of technology (Nwigwe *et al*., 2016).

Nigeria is faced with the problem of low protein supply due to the widening demand-supply gap for livestock products. The per capita consumption of animal protein in Nigeria stands below 9g per day as compared to over 50g per day in North America and Europe (Boland *et al.*, 2013). This is due to the inability of the livestock subsector to meet up with the livestock products demand of the

nation leading to colossal loss of foreign exchange in the importation of livestock products to bridge the demand-supply gap. There has been a lot of research attention to beef cattle production with less attention to other beef cattle value chain activities such as beef marketing. The underlying factors responsible for the magnitude of returns accruing to raw beef marketing and processed beef marking is scanty. The main objective of this study was to determine the factors influencing the profitability of raw beef and processed beef marketers in selected states of North-west zone of Nigeria.

METHODOLOGY

Sample procedure and sample size

Two categories of respondents (Raw beef marketers and processed beef marketers) formed the sample for this study. Multi-stage sampling technique was employed in the selection of the respondents. Firstly, six Local Government Areas (LGAs) Rimin gado, Gwarzo, Kubau, Soba, Faskari and Kafur LGAs were purposively selected (two from each state) based on the availability of cattle markets. Secondly, 10 raw beef marketers (wholesalers and retailers) and 10 processed beef marketers, (*suya* producers, *kilishi* producers and *danbunnama* producers) were randomly selected in each of the 6 LGAs to give a sample size of 60 raw beef marketers and 60 processed beef marketers. The total sample size of respondents for the study is 120.

Method of data collection

The study made use of primary data. Primary data was obtained through the use of computer-aided personal interview (CAPI) version of survey instrument.

Descriptive statistics

Descriptive statistics such as mean, percentages was used to describe the socioeconomic characteristics of the respondents.

Multiple linearregressionanalysis

Multiple linear regression was used to achieve the objective of the study. To determine the factors that influence profitability of raw beef marketing and processed beef marketing, two multiple regressions were estimated each for raw beef marketers and processed beef marketers (*suya* producers, *kilishi* producers and *danbunnama* producers). The explicit form of the regression model is as follows:

For raw beef marketers

$$Y_i = b_{i0} + b_{i1}X_{i1} + b_{i2}X_{i2} + b_{i3}X_{i3} + \cdots + b_{i11}X_{i11} + e_i \ldots\ldots\ldots (1)$$

Where,

Y_i = profit realized from beef cattle value chain activities by raw beef marketers (₦)

$X_{i1} - X_{i11}$ = explanatory variables

X_1 =age (years), X_2 =educational level (years), X_3 = beef marketing experience (years), X_4 = access to credit (₦), X_5= membership of association (Dummy: 1 yes, 0 otherwise), X_6 = market charges (₦), X_7 = cost of labour (₦), X_8 = brokers charges (₦), X_9 = cost of transportation (₦), X_{10} = cost of refrigeration (₦), X_{11} =purchase cost of beef (₦).

For processed beef marketers

$$Y_i = b_{i0} + b_{i1}X_{i1} + b_{i2}X_{i2} + b_{i3}X_{i3} + \cdots + b_{i10}X_{i10} + e_i \ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Where,

Y_i = profit realized from beef cattle value chain activities by processed beef marketers (*suya* producers, *danbunnama* producers *and Kilishi* producers) (₦)

$X_{i1} - X_{i10}$ = explanatory variables

X_1 =age (years), X_2 = educational level (years), X_3 =beef processing experience (years), X_4 = access to credit (₦), X_5= membership of association (Dummy: 1 yes, 0 otherwise), X_6 = market charges (₦), X_7 = cost of labour (₦), X_8 = cost of processing items (₦), X_9 = cost of transportation (₦), X_{10} =purchase cost of beef (₦).

Socio-economic characteristics of beef marketers

The results in Table 1 show that majority of raw beef marketers (51.7%) and processed beef marketers (61.7%) fall within the age bracket of 20-39 years and had mean ages of 42 and 38 years respectively. These results are in line with the age distribution of beef marketers in Edo state (Emokaro and Egbodion, 2014). The results in Table 1 show that about half (51.7%) of the raw beef marketers had one form of formal education while a larger percentage (65%) of the processed beef marketers had one form of formal education. The results is not in agreement with the educational level of beef marketers in Adamawa state (Kubkomawa *et al.*, 2018). Result shows that a larger proportion of raw beef marketers (31.7%) and processed beef marketers (35.0%) had household size of 11-15 and 6-10 persons with mean household size of 12 and 9 persons per household respectively. These results are in agreement with the household size of raw beef marketers in Oyo and Ondo State (Mafimisebi *et al*., 2014). The results are not in consonance with the household size of processed beef marketers in Adamawa state (Girei *et al*., 2014).

Table 1: Socioeconomic characteristics of beef marketers

Socioeconomic characteristics	Raw beef marketers	Processed beef marketers
Age (years)		
20-39	32 (51.7)	37 (61.7)
40-59	28 (45.0)	21 (35.0)
60-79	2 (3.3)	2 (3.3)
Mean	42.4	38.2
Education		
No formal	31 (51.7)	27 (45.0)
Primary	12 (20.0)	14 (23.3)
Secondary	11 (18.3)	16 (26.7)
Tertiary	6 (10.0)	3 (5.0)
Household size		
1-5	12 (20.0)	18 (30.0)
6-10	15 (25.0)	21 (35.0)
11-15	19 (31.7)	14 (23.3)
16-20	8 (13.3)	3 (5.00
21-25	6 (10.0)	4 (6.7)
Mean	11.6	9.1
Experience(years)		
1-10	3 (5.0)	13 (21.7)
11-20	26 (43.3)	23 (38.3)
21-30	19 (31.7)	20 (33.3)
31-40	12 (20.0)	4 (6.7)
Mean	23.2	19.3
C. membership		
Yes	44 (73.3)	45 (75.0)
No	16 (26.7)	15 (25.0)
Credit access		
Yes	36 (60.0)	33 (55.0)
No	24 (40.0)	27 (45.0)

Determinants of profitability of raw beef marketers

The Ordinary Least Square estimates of the multiple regression model used in the analysis of the determinants of profitability of raw beef marketers are presented in Table2.The estimated coefficient of beef marketing experience was positive and significantly related to the profitability of raw beef marketers at 5% probability level which is in accordance with *a priori* expectation. This result implies that an increase in beef marketing experience will have the tendency of increasing the profit of raw beef marketers and this is due to the skill acquired overtime on ways of minimizing costs and attracting better returns. This result concurs with the findings of Adefemi (2012) and Eze (2007) who found that the beef marketing experience significantly influenced profitability of beef marketing in their respective studies. The estimated coefficient of access to credit was positive and significantly related to the raw beef marketers profit at 1% probability level which indicates that an increased access to credit will increase the raw beef marketers' profits. This is in accordance with *a priori* expectation because with more access to credit, beef marketers can meet up with the financial obligations of running their business and take advantage of economies of scale to reduce their production costs. The coefficient of membership of association was positive and significantly related to raw beef marketers profit at 5%. This implies that active participation in beef marketers association will increase the profit of beef marketers and this could be due to the benefits that members can derive in terms of economies of scale through purchase of live cattle, access to credit facilities, access to marketing information and greater bargaining power. The estimated coefficient of market charges was negative and significantly related to raw beef marketers profit at 1% probability level. This implies that an increase in market charges incurred by the beef marketers will reduce the profit realized. As noted by Emokaro and Amadasun (2012), marketing charges constituted a vital component of beef marketing which lends credence to the significant influence of market charges on profit realized from beef marketing. The coefficient of cost of labour was negative and significantly related to raw beef marketers profit at 10% which indicates that an increase in labour cost incurred by the beef marketers will result in a decrease of their profit. As expected, raw beef marketing is labour-intensive due to the processes involved in preparing standard cuts of meat for consumers and with increased cost of labour, profit margin will be affected.

The coefficient of cost of transportation was negative and significantly related to raw beef marketers profit at 5%. This result implies an increase in the cost of transportation incurred in moving beef will result in a decrease in raw beef marketers' profits. The high cost associated with transporting of beef is often due to poor road infrastructure and the long distance in most cases between abattoir and the market outlets. Empirical studies in different parts of Nigeria have also shown that transportation cost is negatively related to profitability of beef marketing (Eze, 2007; Ojogho *et al*., 2012; Adefemi, 2012; Emokaro and Egbodion, 2014). The coefficient of purchase cost of beef was negative and significantly related to raw beef marketers at 1% which indicates that an increase in purchase cost of beef will reduce the profit of raw beef marketers. This implies that raw beef marketers can significantly increase their profit by exploring ways of reducing purchase cost of beef especially through bulk purchase and purchase of live cattle to benefit from economies of scale or integrate backwards into beef cattle farming. This result is in consonance with the findings of Eze (2007) and Okeoghene and Idoge (2013) who reported that purchase cost of beef had significant negative effect on profit realized by beef marketers. Some socioeconomic characteristics (age, education and household size) and costs (brokers charges

and cost of refrigeration) were not significantly related to raw beef marketers profitability.

Table 2: OLS regression estimates of the determinants of profitability of raw beef marketers

Variables	Coefficient	Standard error	t-value
Constant	3.692	0.771	4.789
Age	0.041	0.047	0.889
Education	-0.007	0.016	-0.433
Household size	0.004	0.01	0.383
Beef marketing experience	0.067	0.030	2.233**
Access to credit	0.026	0.009	2.889***
Membership of association	0.009	0.004	2.250**
Market charges	-0.504	0.201	-2.509***
Cost of labour	-0.339	0.186	-1.824*
Brokers charges	0.018	0.068	0.269
Cost of transportation	-0.372	0.174	-2.142**
Cost of refrigeration	0.125	0.076	1.641
Purchase cost of beef	-5.669	2.099	-2.701***
R-squared	0.70		
F-value	13.58***		

Note: *,** and *** indicates significance at 10, 5 and 1% probability levels respectively

Determinants of profitability of processed beef markers

The OLS estimates of multiple regression model used in the analysis of the determinants of profitability of processed beef marketers are presented in Table 3. The coefficient of beef marketing experience was positive and significantly related to process beef marketers profit at 1%. This result implies that an increase in the marketing experience of the beef marketers will result in an increase in their profit. This arises as experience acquired improves managerial skills especially in costs and returns issues, which in turn leads to better decision making towards realizing increased profit. This result compares favorably with that of Mohammed *et al*. (2015) who reported that marketing experience is positively related to returns. The estimated coefficient of access to credit was positive and significantly related to processed beef marketers profit at 5% probability level which indicates that an increase in access to credit will result in an increase in profit realized by the beef marketers. This implies that there is hope for increasing processed beef marketers profitability through increased access to credit which can address the challenges of cash constraint in beef processing. This is in line with Oberholster *et al.* (2015) who noted that access to credit is a key enabler in financing agricultural production from a value chain perspective. The coefficient of cost of labour was negative and significantly related to processed beef marketers profit at 1% which indicates that an increase in labor cost incurred

in processed beef marketing will result in a decrease in profitability of processed beef marketing. This implies that with the high labour demand in processing raw beef to the forms desired by consumers, an increase in labour cost will affect profit margin. This result is consistent with Ahmadu and Aduwa (2015) whose study showed that labour cost incurred in beef processing was equally negative and significantly related to profit realized. The estimated coefficient of cost of processing items was negative and significantly related to processed beef marketers profit at 5% probability level. This means that an increase in cost of processing items will lead to a decrease in profit realized by the processed beef marketers which is in line with *a priori* expectation as minimizing processing cost for a given level of output is desirable. This result is not in line with Ahmadu and Ibrahim (2013) who reported that incurring more cost of processing items will increase returns realized from processed beef marketing. The coefficient of purchase cost of beef was negative and significantly related to processed beef marketers profit at 1%. This implies that an increase in purchase cost of beef will lead to a decrease in the profit realized by the processed beef marketers. This further implies that exploring opportunities to reduce the unit cost of purchasing beef can significantly reduce costs incurred and increase profit realized. This study is at variance with the findings of Ahmadu and Ibrahim (2013) and Ahmadu and Aduwa (2015) who revealed that cost of purchase of beef had positive effect on the profitability of processed beef marketing. Some socioeconomic characteristics (age, education, household size, membership of association and costs (market charges, cost of transportation) were not significantly related to processed beef profitability.

Table 3: OLS regression estimates of the determinants of profitability of processed beef marketers

Variables	Coefficient	Standard error	t-value
Constant	3.483	0.776	4.486
Age	-0.009	0.064	-0.147
Education	0.021	0.019	1.094
Household size	-0.007	0.010	-0.754
Beef marketing experience	0.029	0.012	2.417***
Access to credit	0.018	0.009	2.000**
Membership of association	0.004	0.157	0.025
Market charges	-0.060	0.073	-0.822
Cost of labour	-0.811	0.310	-2.616***
Cost of processing items	-0.447	0.196	-2.280**
Cost of transportation	0.185	0.163	1.135
Purchase cost of beef	-3.737	1.211	-3.086***
R-squared	0.66		
F-value	13.11***		

Note: *, ** and *** indicates significance at 10, 5 and 1% probability levels respectively

CONCLUSION AND RECOMMENDATION

Based on the findings of the study, raw beef marketers and processed beef marketers can significantly increase their profit by having access to credit facilities such as the government loan scheme. It is recommended that raw beef marketers and processed beef

marketers should be supported with easy access to credit such as the collateral-free and interest-free loans under the MARKETMONI and TRADERMONI loan schemes under the Government Enterprise and Empowerment Programme (GEEP). This is necessary as better access to credit through the government loan schemes and other sources will help to increase the profitability of beef marketers. Also, raw beef marketers and processed beef marketers can significantly increase their profit by exploring ways of reducing purchase cost of beef especially through bulk purchase and purchase of live cattle to benefit from economies of scale or integrate backwards into beef cattle farming.

REFERENCE

Ahmadu, J. and Aduwa, M. O. A. (2015).Economic analysis of *suya* production in Benin City, Edo State, Nigeria.*Journal of Agricultural Science and Environment*, 15 (1): 15- 24.

Ahmadu, J. and Ibrahim, E. J. (2013).Determinants of revenue in *suya* production in Benin City, Edo State, Nigeria.*Nigerian Journal of Agriculture, Food and Environment*, 9(3): 1-5.

Adefemi, J.,O. (2012). Profitability of beef marketing in Ilorin east Local Government Area of Kwara State, Nigeria.*Prime Research on Biotechnology (PRB),* 2(3):47-52.

Bénard, C. Bonnet, B. Guibert, B. (2010). Demand for farm animal products in Nigeria: An opportunity for Sahel countries. Special Report, No 51 14-15.

Boland, M. J., Rae, A. N., Vereijken, J. M., Meuwissen, M. P. M., Fischer, A. R. H., Van Boekel, M. A. J. S., Rutherfurd, S. M., Gruppen, H., Moughan, P. J. and Hendriks, W. H. (2013). The future supply of animal-derived protein for human consumption. *Trends Food Science Technology*, 29(1):62-73.

Emokaro, C. O. and Amadusun, O. J. (2012).Analysis of beef marketing in Benin City, Nigeria.*Nigerian Journal of Agriculture, Food and Environment*, 8(3): 26-31.

Emokaro, C. O. and Egbodion, J. (2014).Effect of marketing cost on marketing margin realizablefrom beef sales in Benin City, Nigeria. *American Journal of Experimental Agriculture*, 4(2): 215-224.

Eze, C. C. (2007).Marketing margin and determinants of net returns of beef marketing in Southeast Nigeria.*Tropical Science*, 47(2): 89-95.

FAOSTAT (2017).Food and agriculture organization of the United Nations.Productiondataset. http://faostat3.fao.

Girei, A. A., Dire, B. and Bello, B. H. (2014).Economics of cattle marketing on the socio-economic characteristics of cattle marketers in central zone of Adamawa State, Nigeria.*International Journal of Advanced Agricultural Research*, 2: 1-7.

Kubkomawa, H. I., Adamu, S. M., Achonwa, C. C., Adewuyi, K. A. and Okoli, I. C. (2018).Beef production and marketing in Nigeria: Entrepreneurship in animal agriculture. *International Journal of Veterinary Science and Animal Husbandry*, 3(2): 26-40.

Mafimisebi, T. E., Bobola, O.M. and Mafimisebi, O.E. (2014). Fundamentals of cattle marketing in Southwest, Nigeria: Analyzing market intermediaries, price formation and yield performance. *Applied Tropical Agriculture*, 19(1): 30-38.

Mohammed, D., Mohammed, A. and Dahiru, A. B. (2015).Determinants of profitability of

cattle fattening scheme in Song Local Government Area, Adamawa State, Nigeria. *Journal of Agricultural Economics, Environment and Social Sciences,*1(1):155-162.

Nwigwe, C., Okoruwa, V., Adenegan, K. and Olajide, A. (2016). Technical efficiency of beef cattle production technologies in Nigeria: A stochastic frontier analysis. *African Journal of Agricultural Research,* 11(51): 5152-5161.

Oberholster, C., Adendorff, C. and Jonker, K. (2015).Financing agricultural production from a value chain perspective: recent evidence from South Africa. *Outlook on Agriculture*, 44(1): 49-60.

Ojogho, O. Erhabor, P. O., Emokaro, C.O. and Ahmadu, J. (2012). Marketing margin and price transmission analysis for beef in Benin Metropolis. *International Journal of Agricultural Economics and Rural Development*, 5(1): 63-73.

Okeoghene, E. S. and Idoge, D. E. (2013).Analysis of beef marketing in Oshimili South Local Government Area, Delta State, Nigeria.*Journal of Natural Sciences Research*, 3(2): 104-111.

Umar, A. S. S., Alamu, J. F. and Adeniji, O. B. (2008). Economic analysis of small scale cow fattening enterprise in Bama Local Government Area of Borno State, Nigeria.*PAT Journal*, 4 (1): 1-10.

World Health Organization, (2008). Agriculture in Sub-Saharan Africa: Prospect and challenges for the next Decade