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ANALYSIS OF SAFETY PRACTICES AMONG BEEF MARKETERS IN BAUCHI METROPOLIS, BAUCHI STATE, NIGERIA

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Abstract
This study analysed safety practices among beef marketers in Bauchi Metropolis, Bauchi State, Nigeria. A simple random sampling technique was used to select 70 beef marketers as sample size for the study, Data were collected using structured questionnaire and analyzed using descriptive statistics, inferential statistics, costs and returns analysis. The result revealed that majority (91%) of the respondents were males, 58% of them fell within 31-40 years of age. The result also revealed that 65% were married, 25% singled and 3% widowed; 85% had one form of formal education or the other, while 45% had family size ranging from 11-15 persons. The results further revealed that, majority (51%) had 11-20 years of marketing experience, while 47% of the respondents had personal savings as the major source of capital. The multiple regression analysis showed that, education and training, monitoring and evaluation, foodborne illness outbreak, regulatory requirements and economic incentives were significant ($p<0.5$), hence the major determinants of adoption of safety practices by the beef marketers. The R^2 value of 0.854 implies that the independent variables were able to jointly explain about 85.4% of the variation in the dependent variable. A net return of N100.07k per kilogram of beef was obtained, showing that beef marketing was profitable in the study area. The major constraints identified were poor sales, inadequate capital and spoilage due to erratic power supply. The study concluded that beef marketers had satisfactory knowledge mainly on whether meat can be contaminated by poor handling and were aware that contaminated meat can cause illness. Regular informal food safety education, demonstration and hands-on training on meat safety is recommended for beef marketers. Food safety regulations should be enforced to the latter in order to protect human lives.
Keywords: Analysis, Safety, practices, beef, Marketers.

1.0 Introduction

Foodborne diseases (FBDs) are common public health problems experienced in daily life. They are infectious and toxic diseases caused by biological, chemical, or physical agents that use food as vehicle of transmission. FBDs also result from

consuming food and water that have been contaminated with micro-organisms and toxins, which eventually lead to severe clinical conditions and death in some cases (Isoni Auad *et al.,* 2019). In addition, food handlers can transmit FBDs through cuts or sores in their mouths or on their skin (Adzitey *et al.,* 2018). The hazards that cause FBDs can happen in various stages of food production, thereby influencing the health of the public and result in serious economic damage (Ifeadike, 2014).

Food safety is defined as the circumstances and procedures required while producing, processing, storing, distributing, and preparing food to guarantee wholesome and fit for Human consumption (Ifeadike *et al*., 2014). The five core food safety practices are often described as washing hands and surfaces, separating raw food from cooked food, cooking food to proper temperatures, refrigerating food promptly and avoiding consuming food from unsafe sources. Therefore, food safety practices are critical key public health issues to be considered in preventing and controlling foodborne illnesses because the transmission of these diseases can be exasperated by unsafe food safety practices of the food handlers (Dagne *et al*., 2019).

A food handler is a person whose tasks necessitate handling, storing, preparing, manufacturing, selling, or serving food and cleaning surfaces and places exposed to food (Ncube *et al*., 2019). As food and water contamination occur at distinct phases of food production, a food handler should ensure food safety throughout the chain (Isoni Auad *et al*., 2019). In most public establishments, the food handlers are the principal persons to contaminate food by being a biological or physical conveyor of many pathogens, and the amount of contamination can be very much determined by the amount of exposure (Chekol *et al*., 2019).

Thus, lack of food safety control measures is a crucial public health issue in most

parts of the world. In Sub-Saharan Africa, especially Nigeria, despite the government's effort to enhance the safety of food supply by the National Agency for Food and Drug Administration and Control (NAFDAC), food safety remains a significant problem that has worsened by people's ignorance of food hygiene, the attitude of the government towards food safety control and also inadequate enforcement, legislation and regulations.

In Nigeria, there is a rise in the consumption of food prepared in public places due to population relocation and changes in the consumers' behaviors and demand. In the urban areas, eating and drinking in food establishments (restaurants, bakeries etc.) have become very common. This Food Service Establishment serves food to the public within a short period, which implies the risk of possible contamination (Alemayehu *et al*., 2021). Unsafe food cycle of foodborne diseases seriously hampers public health and socioeconomic growth. Hazardous practices of the food handler worsens the transmission of foodborne diseases which have been estimated to be the result of contamination by food handlers (Dagne *et al*., 2019). In developing countries like Nigeria, the usual weather temperature is perfect for the growth of microorganisms that cause food poisoning. As a result, food may sometimes look attractive, smell and even taste normal, but still bring about severe illness shortly after ingestion (Ifeadike *et al*., 2014).

Foodborne illnesses remain a significant component of human disease and the consumption of contaminated meat plays a major role in this. Food safety continues to be a critical issue among professionals in the food service sector as well as consumers. However, diseases that spread through food are common and persistent problems that result in appreciable morbidity and occasionally death. Fresh foods, especially those of

animal origin such as beef, are highly vulnerable to contamination. Incidence of FBDs is reduced if strict food protection measures are in place from primary production to the consumer. Food workers have been implicated in the spread of foodborne diseases. Grema *et al,(* 2020*)* indicated that food handlers are a major cause of food contamination.

Despite the fact that attempts are made in most abattoirs to follow regulations set to protect consumers' health, the problem of meat hygiene and safety due to handling and processing remains a challenge. In the face of numerous efforts by stakeholders to ensure meat safety in Nigeria, the incidence of foodborne illnesses is still high; hence there is need to identify specific knowledge gaps with regards to safety practices among meat sellers in the Metropolis to ensure consumer health and safety, since food handlers are integral to the improvement of food safety and prevention of foodborne illnesses. It is therefore against this backdrop that the study was embarked upon and tend to raise the following research questions:

i. What are the socio economic characteristics of beef marketers in the study area?
ii. What are the factors that determine adoption of safety practices by beef marketers?
iii. Is beef marketing profitable?
iv. What are the constraints to beef marketing in the study area?

2.0 Objectives of the Study

The broad objective of the study was to analyze Safety practices among beef marketers in Bauchi Metropolis. The specific objectives were to:

i. describe the socioeconomic characteristics of beef marketers in the study area
ii. identify the factors that determine the adoption of safety practices among beef marketers

iii. determine the profitability of beef marketing in the study area

iv. identify the constraints to beef marketing in the study area.

3.0 Methodology

3.1 The Study Area

The study area is Bauchi metropolis, the headquarters of Bauchi Local Government Area (LGA) which lies between longitude 10°10'N and 10°33'N and Latitudes 9°40'E to 10°13'E. Its altitude is 690.2m above sea level. The Local Government Area has 75 to 80% of its land area as cultivable out of which about 150,000 hectares is suitable for Fadama (Irrigation) farming. Over 85% of the population is peasant agrarian and rural based, whose farming system is mainly mixed farming with small holdings of about 3-5 ha per farm family. The population of Bauchi Local Government Area in 2006, according to National Population Commission was 493,810 (NPC, 2006). The major economic activity of the people of the metropolis is agriculture and trading. The major crops grown are sorghum, millet, rice, hungary rice, cowpea, maize and groundnuts. The following Animal production components are also carried out: cattle rearing, goat production, ram fattening and poultry keeping among others.

3.2 Sampling Procedure and Sample Size

Purposive sampling technique was used in selecting four markets, which include Muda-Lawal, Wunti, Central and Yelwa Tudu markets. This is due to the metropolitan nature of the markets and the availability of beef marketers in these markets. The beef marketers were selected using a simple random technique, where; 25 beef marketers were selected in Muda-Lawal market, 17 in Central market, 17 in Wunti market and 11 in Yelwa Tudu market respectively, given a total sample of 70 beef marketers for the study.

3.3 Method of Data Collection

The data used for this study were obtained by means of structured questionnaire administered to 70 respondents (fresh beef marketers).

3.4 Analytical Techniques

Simple descriptive statistics, which include frequencies, percentage and mean were used to analyse objectives i and iv; costs and returns analysis were used to analyse objective iii, whereas inferential statistics (Regression Model) was used to analyze objective ii.

3.5 Model Specification

3.5.1 Costs and returns for beef marketing

The net return of the beef marketers is the profit made in the course of the marketing and it is calculate as;

$NR=TR–TC;$ … (i)

Where;

NR = Net return

TR = Total revenue (price of quantity sold)

TC = Total cost (fixed cost and Variable cost)

3.5.2 Multiple Regression Analysis

The model is explicitly expressed as

$Y= a+b_1X_1+b_2X_2+b_3X_3+b_4X_4+b_5X_5+b_6X_6+b_7X_7+e$ … (ii)

Where;

Y = Meat Safety Practices

a = Constant

X_1 = Cost (N)

X_2 = Regulatory requirement

X_3 = Economic incentive

X_4 = Negligence

X_5 = Education and training

X_6 = Monitoring and evaluation

X_7 = Food-borne illness outbreak

b_1- b_7 = Regression Coefficient

e = Error term

4.0 Results and Discussion

4.1 Socio-economic Characteristics of Beef Marketers

Table 1 reveals that majority (90.5%) of beef marketers were males, implying that the proportion of males in beef marketing is higher. This is in accordance with the findings of Ahmed (2014) on evaluation of performance of beef marketing in Kaduna State, who revealed that high proportion of beef marketers were males. It further revealed a mean age of 39years, implying that majority of beef marketers were young and active. This is in accordance with the findings of Emokaro and Amadasum (2012) who revealed that most beef marketers were between the ages of 28 – 45 years.

Table 1 also shows that majority (65%) of the respondents were married, which implies that married men and women participated in beef marketing more than singled in order to cater for their children and family members' responsibilities. Those who are married usually have more responsibilities and hence take beef marketing as a source of livelihood to cater for their family needs (Oladejo, 2012). It further indicates that majority (70%) were literate, having attained different educational levels. This may be as a result of the increasing rate of enrolment into primary and secondary schools in the nation through the help of universal basic primary education programme embarked upon

by the Federal Government.

Table 1 shows a mean household size of 10 persons per household, indicating relatively large family. Large household size implies large number of people depending on the beef marketers for their survival. Hence, the beef marketers will perform the marketing function effectively so as to generate income to take care of their family responsibilities. An average experience of 11years was obtained by the beef marketers. Since majority of the beef marketers have 26 years of experience in the marketing process, they become specialized, which could results into increased productivity (Adeoye *et al*., 2019). About 95% of the beef marketers sourced their capital from personal savings which implies that informal sources provide the bulk of capital used in beef marketing in the study area. This means that a lot of potential for expansion can be achieved if marketers look up to banks for loans.

Table 1: Socioeconomic distribution of beef marketers (n=70)

Variable	Frequency	Percentage (%)	Mean
Sex			
Male	67	91	
Female	3	09	
Age (years)			
20 – 30	10	12	
31 – 40	33	58	39
41 – 50	20	25	
51 - 60	07	05	
Marital status			
Single	20	25	
Married	36	65	
Divorced	10	07	
Widowed	04	03	
Educational background			
Non formal education	12	15	
Primary education	19	22	
Secondary education	31	53	
Tertiary education	08	10	
Household size (years)			
0 – 5 -	15	18	
6 - 10	21	35	10
11 – 15	28	45	
16 - 20	06	03	
Marketing experience			
1 – 5	09	12	
6 – 10 years	26	37	11
11 – 20 years	35	51	
Source of capital			
Personal savings	29	47	
Family and friends	19	27	
Bank	07	05	
Parents	15	21	

Source: Field survey (2024).

4.2 Multiple Regression Analysis of factors that determine adoption of safety practices among beef marketers

Table 2 shows the independent variables which are identified as Cost, Regulatory requirement, Education and training, Negligence, Monitoring and evaluation, Food borne illness outbreak and Economic incentive. According to Abdul-Mutalib *et al.* (2012), conventional regression seeks to determine the relationship between dependent variable and independent variables. Based on the results, education and training were positive and significant ($P<0.001$), implying that the higher a marketer is educated, the more the marketer is willing to adopt safety practices. Monitoring and evaluation, and foodborne disease outbreak were significant ($P<0.01$), suggesting that an increase in the intensity of monitoring will ensure strict adherence to safety practices. Regulatory requirement and economic incentive were significant ($P<0.05$), which indicates that a unit increase in these variables will result in the increase in adoption of safety practices among beef marketers in the study area. Costs of marketing and negligence were negative but not significant, implying that they influenced adoption of safety practices in an inverse direction. The value of R^2 is 0.854, which implies that the independent variables were able to jointly explain about 85.4% of the variation in the dependent variable (Adoption of safety practices). The high value of the R^2 is an indication that the model is correctly specified or fitted.

Table 2: Factors that determine adoption of safety practices among beef marketers

Variables	Beta ß	t-value	Significance
Constant	-81.925	-2.124	0.27
Cost	-1.856 ^{NS}	4.540	0.345
Regulatory requirement	1.249*	3.050	0.04
Education and training	4.059***	1.219	0.001
Negligence	-7.318 ^{NS}	1.305	0.167
Monitoring and Evaluation	1.827**	2.284	0.03
Food borne illness outbreak	2.143**	1.218	0.005
Economic incentive	-1.809*	0.29	0.02
R square = 0.8544			
Adjusted R square = 0.814			

Source: Field Survey (2024).

*= Significant at 10%, **= Significant at 5%, ***= Significant at 1%, ^{NS} = Not significant.

4.3 Cost and Return from Beef marketing in Bauchi Metropolis

Table 3 shows that beef marketers incurred a total variable cost, which included cost of purchase, transportation cost, storage (refrigerating cost), packaging cost and miscellaneous (other costs) as N2,099.93 and generated a revenue of N2,200 per kilogram of beef. Net return of N100.07 per kilogram of beef was obtained, showing that beef marketing was profitable in the study area. Marketing efficiency of N1.05 was realized from the business venture and this means the business was economically efficient in terms of inputs output ratio. Marketing efficiency of N1.05 implies that for every N1 invested in the business, 1.05k was realized as net profit. This agrees with Obasi and Amaechi (2013), who also showed that marketing was profitable.

Table 3: Cost and return from Beef marketing in Bauchi metropolis

Variable	Value (₦) (Per/kg)
Cost of beef purchased	2,040.67
Transportation cost	32.50
Storage cost	15.76
Cost of dressing carcass	5.0
Miscellaneous (other costs)	6.0
Total variable cost	2,099.93
Total revenue	2,200
Net return (profit)	100.07
Marketing efficiency	1.05

Source: Field survey (2024)

4.4 Constraints to beef marketers in the study area

Table 4 revealed the major marketing constraints faced by beef marketers in the study area. From the table, poor sales, inadequate capital, spoilage due to erratic power supply are the three major constraints, while price fluctuation, transportation cost and poor record keeping were ranked 4th, 5th and 6th, respectively. Poor sales implies the inability of the beef marketers to quickly convert the produce (beef) to cash, which results to low net profit, inadequate capital pose a threat on the consistency of the business, there is high risk of spoilage due to erratic power supply. Furthermore, price fluctuation may increase marketers' purchase and increase consumer prices, while higher transportation cost results in lower net revenue. This is in accordance with a study conducted by Oladejo (2012) which indicates that transportation cost is an expenses and encroaches in the expenses of the marketer.

Table 4: Constraint to Beef sellers in the study area.

Marketing Constraints	Mean	Standard Deviation	Ranking
Poor sales	4.56	0.59	1st
Inadequate capital	4.43	0.51	2nd
Spoilage	4.31	0.47	3rd
Price fluctuation	3.18	0.43	4th
Transportation cost	2.92	0.39	5th
Poor records keeping	2.51	0.33	6th

Source: Field survey, 2024

5.0 Conclusion and Recommendations

5.1 Conclusion

Beef marketers had satisfactory knowledge mainly on whether meat can be contaminated by poor handling and were aware that contaminated meat can cause illness. Although most of the beef sellers had basic understanding about personal hygiene, hand washing and proper cleaning, this did not translate into strict food hygiene practices. The beef marketers lacked training in safe meat handling and education concerning issues relating to meat safety. It was also concluded that a net return of N100.09k per kilogram of beef and a marketing efficiency of 1.05k were found from the analysis which are indications that beef marketing is profitable and there were no barriers to entry and exit conditions.

5.2 Recommendations

Based on the findings, the following recommendations were made;

1. Regular informal food safety education, demonstrations and hands-on training on meat safety is recommended for meat sellers in the Metropolis.
2. Food safety regulations should be enforced to the latter in order to protect human lives.
3. Credit facilities should be provided by formal and informal sources to young people, this could reduce the heavy weight of unemployment in the study area.

4. Beef marketers should form a viable and formidable marketing association and cooperative society to help stabilize prices and increase the chances for obtaining loans from private sectors (financial institutions) hence benefiting from various government credit schemes to boost small and medium-sized enterprises (SMEs) and
5. Beef marketers should be encouraged to keep proper records on cost of marketing and returns on a day to day basis reflecting marketing activities on beef business, thus improving marketing efficiency.

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