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CONSUMER PREFERENCE ANALYSIS AND DEMAND FOR MEAT IN KANO METROPOLIS: A HEDONIC MODEL APPROACH

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ABSTRACT

This study examined consumer preference and demand analysis for meat in Kano metropolis. Primary data were collected through a well-structured questionnaire, a total of one hundred and fifty 158 member of household was selected for this study. It was revealed that majority (72.2%) of consumers earns monthly income of N15, 000-N55, 000. Hedonic regression for meat attributes affecting Price shows that meat flavour (Good) was the reference group while meat with bad flavour was entered as dummy variables and the result shows that meat with good flavour was statistically significant at (P< 0.05) with positive coefficient implying that for any unit increase in these variables, buyers would be willing to pay premium because they showed higher significant buyer preference level, results also shows that meat with good taste was statistically significant at (P< 0.05) with positive coefficient this implying that meat with good taste are point of interest for the consumers and they are ready to pay high premium to buy the commodities with this attributes. It was revealed that amount of fat (high) was found to be statistically significant with a negative coefficient, implying that meat with low fat is more preferable and are selling at higher prices in the study area. Low income of consumer was the highest constraints associated with meat consumption in the study area, with a mean rank of 3.01, followed by high selling price with the mean rank of 3.63 and food safety with 4.20. Household size and poor storage facilities were the least ranked or lowest constraints affecting the consumers of meat in Kano metropolis.

Keywords: Consumer Preference, Analysis, Demand, Meat, Kano

INTRODUCTION

The supply of animal protein in Nigeria is unevenly distributed throughout the country and sometimes within the households, where urban dwellers eat more animal protein than those living in rural areas because urban dwellers earn higher income which enables them to afford the market price, (Sanusi and Adewoyin, 2014).The level of meat consumption has direct influence on general wellbeing, health and productivity of the people. Protein of animal origin is not just preferred because of its palatability but because it is essential for normal physical and mental development of man. In Nigeria, it has been reported that animal protein contributes only 8.6% of an estimated 51.7% daily protein intake of the average Nigerian. The recommended total minimum intake for an adult is 85.9% per day of which about 34g – 40g should be from animal origin. However, a shortfall of 16.4% protein intake of animal origin in the diet of an average Nigerian has been reported by (Akinsulu *et al*, (2019)

The meats from cattle, goat, sheep, pig and poultry, are the main sources of animal protein consumed in Nigeria, where it was estimated that the daily minimum crude protein requirement of an adult in Nigeria varies between 65g and 85g per person, and it was recommended that 35g of this should be obtained from animal products. Consumer preference explains how a consumer ranks a collection of goods or services or prefers one collection over another. This definition assumes that consumers rank goods or services by the amount of satisfaction, or utility afforded. This shows that a preference of choice for consumption exists in spite of the importance of meat as a source of protein with high biological value. Factors that affect the consumption of meat can be classified as economic, social and cultural factors, specifically, religion, age, sex, socio-economic factors, individual variation and income are major factors that have influenced meat consumption pattern in Nigeria. Sanusi and Adewoyin, (2014) opined that some of those factors that influence preference for meat include nutritional value, taste, freshness or tenderness, availability, affordability, ease of preparation or cooking, fat content and several others.

In spite of the increase in consumption, the quality of meat consumed remains of interest from a marketing perspective. Changing consumer demand has influence on the market for all types of meat, due to changes in attitudes toward diet and consciousness about healthy living as studies have indicated relationship between some components of foods quantity-wise and some cancers and chronic diseases in humans (Ogbeide, 2015)). Consumers' preferences for certain products are becoming more evident in the market as the behaviour they demonstrate suggests that they seek particular quality attributes in the products (Ogbeide, 2015)). Therefore information about consumers' meat preference is crucial in developing and implementing appropriate livestock improvement strategies.

Statistics show that Nigeria's per-capita meat consumption is approximately 6.4 kilograms per annum, China's is about 23 kilograms, but, Canadians consume an average of 65 kilograms a year and the citizens of the US eat 95 kilograms. Nigeria is not only one of the largest meat producing countries in Africa but also one of the largest meat consumers in this region of the world, according to a study titled 'Consumerism: Statistical Estimation of Nigeria Meat Demand' by (Osho and Asghar 2011). Considering all these factors, this study was carried out with the objectives to, describe the socio-economics characteristics of the respondents, determine the effects of meat attributes on perceive price of meat products

and describe constraints associated with meat consumption in the study area.

METHODOLOGY

Study Area

Kano State is situated in the Sudan savannah agro-ecological zone of Nigeria located between latitudes 9º 30′, and 12º 37′ North and longitudes 7º 34′ and 9º 25′ East. The State is bordered to the west and Northwest by Kastina State, to the east by Jigawa State, to the south by Bauchi State and to the southwest by Kaduna State. The 2006 population census estimated Kano State population at 9,383,682. The major tribes are Hausa and Fulani ethnic groups but other ethnic groups inhabiting the State include almost all major and minor tribes in Nigeria. Other nationals such as from Ghana, Cameroon, Niger, Chad, India and China are also found in Kano. Increase in population is put at seven percent per annum. The people are predominantly low income farmers cultivating food and cash crops. They also embark on small, medium and large – scale livestock production such as rearing of goats, sheep and poultry as well as marketing of their products. Kano Metropolis, comprising Kano Municipal, Nassarawa, Tarauni, Fagge, Dala, Gwale and Kumbotso made up the study area within which over 10% of the total population are residing.

Sampling Techniques and Sample Size

A Multi–stage sampling technique was used to select the respondents. The first phase was the researcher determined sample size from a given population of 1,167,749 that made up members of household in the three Local Government Areas (LGAs) of Kano Metropolis that will be purposively selected out of eight Local Government Areas (LGAs) using a table for determining sample size from given population developed by Krejcie and Morgan; 158 members of household were selected as the sample size. The second phase, involved the allocation of 158 to different LGAs based on probability proportional to size (PPS) of the population of each LGAs.

Table 1: Sample Allocation Based on PPS (Probability Proportional to Size)

S/N	Local Government Area	Population	Sample Size
1	Fagge	200,095	27
2	Kano Municipal Council (KMC)	371,243	50
3	Nasarawa	596,411	81
	Total	1,167,749	158

Source: Field Survey 2021

Data Collection and Analyses

The main instrument for collecting data was an open-ended questionnaire administered through individual interview. Data were analyzed using both descriptive and inferential statistics. Descriptive statistics such as frequency and percentages, hedonic price model and Kendall's Coefficient of concordance were used to achieved the objectives

Model Specification

Descriptive Statistics:

These are concerned with scientific methods for summarizing presenting and analyzing data as well as drawing valid conclusions and making reasonable decisions on the basis of such analysis. This is done with the aid of mean, percentage, frequency distribution etc.

Mean; this is the sum values in the data group divided by the number of values it is the most useful and fundamental measure of location

$$\overline{X} = \frac{\Sigma fx}{\Sigma f} \quad (1)$$

Percentage; this is proportion obtained by dividing the number of observations in each class by the total number of observations multiplied by a hundred

$$\text{percentage} = \frac{\text{actual change}}{\text{original amount}} x\ 100 \quad (2)$$

Frequency Distribution; this is an organized display of data set which falls into each mutually exclusive class. Therefore for easy comprehension of findings of this research and its contribution to knowledge it was grouped field data in the form of frequency distribution tables, bar charts, pie charts and percentage tables.

Hedonic Price Model:

The hedonic model which is derived from the theory of consumer choice as postulated by Lancaster (1966) shall be used.

The model states that the price of a good is explained in terms of a good's characteristics. Thus, it describes the price of a good as a linear summation of the implicit value of its attributes. (Wooldridge, 2000 & Rosen 1974, Edmeades, 2006) mathematically expressed as:

For this research, the consumer goods characteristics models can be mathematically presented as:

$$Pr = \sum_{j=1}^{m} X_{RL,IJ} P_{RL,IJ} \quad (3)$$

Where

Pr= Price of meat per kilogram

XR_{LIJ} = Quality characteristics of Color, Flavor, Taste, Nutritional value, packaging, Appearance, Amount of fat Price and Availability

P_{LIJ} = implicit price of characteristics. Implicit price of characteristics

Using shazam econometric statistical software package, the price as dependent variable was measured in naira per kilogram and the independent variables weight (kg) were entered as absolute values, while Color, Flavor, Taste, Nutritional value, packaging, Appearance, Amount of fat and Availability were entered as a dummy variables.

Thus the model is denoted by the following equation

Pr/kg = f (C, F, T, NV, P, A, AF, P, and A) (4)

Pr/kg = price per kilogram

C = color (color is the reference group and without color will be entered as dummy variables)

F= Flavor (Good flavor is the reference group, bad flavor will be the dummy variables)

T= Taste (meat with good taste is the reference group, and tasteless are the dummy variables)

NV = Nutritional value (meat with nutritional value is the reference group, and no nutritional value are the dummy variables)

P = Packaging (well packaging meat as the reference group and moderately package are the dummy variables)

A= Appearance (meat with high good appearance is the reference group, meat with no good appearance will be entered as dummy variables

AF= Amount of fat (meat with high fat is the reference group and meat with low fat as a dummy)

A= Availability (Regular supply of meat as the reference group and Seasonal supply is the dummy variable)

The results will be subject to test of significance by use of coefficient level of significance (i.e P<0.001, p<0.01, p<0.05 and p<0.0)

K*endall's* C*oefficient of* C*oncordance:*

Kendall's coefficient of concordance is one of the most frequently used nonparametric methods for assessing a set of observation. This is widely used perhaps due to its ability to provide both the ranks of the observations and the level of agreement among the set of observations. In its application, a list of constraints is provided to the respondents and the individual respondent is allowed to provide his/her ranking of the constraint, depending on most important to less important or vice versa.

In this study, a list of problem associated with meat consumption was presented to the respondents and they were asked to rank them in order of importance in terms of preference.

The sum of ranks is then provided but, in most empirical studies, it is common to observe the mean of ranks. Kendall's coefficient of concordance (*W*) is given as Legendre *et al*,,(2005).

$$W = \frac{12S}{P2\,(n2-n)} - P^t \qquad (5)$$

Where:

W = coefficient of concordance

K = number of sets of ranking i.e number of judges (respondents) ranking the constraints

N = number of constraints

S = sum of square of the deviation over row sum of rank (R_i) which is given by

$$S = \sum_{i=1}^{n}(Ri - R) \qquad (6)$$

R is the mean of *Ri.* The correction factor for tied ranks (T) is also given as:

$$T = \sum_{k=1}^{m} (t_k^3 - t_k) \qquad (7)$$

t^3 is the number of ranks in each of *m* group of ties. The problem to be ranked are Low income of consumer, high level of poverty, food safety, high selling price, Religious, level of education, poor storage facility and household size.

RESULTS AND DISCUSSION

Demographic Characteristics of Respondents

Table 2a shows some important demographic characteristics consisting of Age, Household size, Income level, Gender, Marital status, level of Education and Occupation.

The result of age distribution of the respondents showed that 48.1% of the consumers were young adults of active age bracket of 38-46. Meaning that this age group is capable of making positive decision on household expenditure on food items. Household size is a very important factor, especially in determining the quantity of the meat consumed in the household. The result shows that majority (39.6%) of the consumers' household sizes falls within the range of 1-5, and (21.1%) of the consumers' household sizes falls within the range of 6-11. Income dictates to a large extend the consumers choice of goods. A rational consumer will make a right choice of superior and high quality goods as income increases. The result in shows that majority (72.2%) of consumers earns monthly income of ₦15, 000-₦55, 000.

Table 2a: Distribution of Quantitative Socio-Economic Characteristic of the Respondents (Quantitative Variables)

Variable	Frequency	Percentage (%)
Age(Years)		
18-28	30	19.0
29-37	41	25.9
38-46	76	48.1
47-55	8	5.1
56-64	3	1.9
Total	158	100.0
Household size		
1-5	90	39.6
6-11	48	21.1
12-17	15	6.6
18-23	5	2.2
Total	158	100.0
Income level per month		
15,000- 55,000	114	72.2
56,000-97,000	21	13.3
98,000-139,000	12	7.6
140,000-181,000	5	3.2
182,000-250	6	3.8
Total	158	100.0

Source: Field Survey, 2021

Table 2b: Distribution of Qualitative Socioeconomics Characteristic of the Respondents (Qualitative Variables)

Variable	Frequency	Percentage (%)
Sex		
Male	119	75.3
Female	39	24.7
Total	158	100.0
Marital status		
Single	57	36.1

Married	95	60.1
Widow	2	1.3
Divorced	4	2.5
Total	158	100.0
Occupation		
Farming	14	16.2
Teaching	42	25.6
Trading	61	38.6
Civil servant	21	11.7
Artisanship	13	8.2
Other	7	7.7
Total	158	100.0
Educational qualification		
No formal qualification	1	0.6
Primary	4	2.5
Secondary	82	51.9
Tertiary	71	44.9
Total	158	100.0
Primary shopper		
Yes	113	76.7
No	45	23.3

Source: Field Survey 2021

Gender is used to describe the characteristic of men and women that are socially constructed. People are born male or female, but learn to be boys and girls who grow into men and women. The majority (75.3%) of the meat consumers were found to be Male. This implies that meat consumers is dominated by male. Even though both sexes consume meat a time but male dominate the female. The implication is that, differences in culture and religion plays a major role in Gender participation in meat consumers. The result also shows that most (60.1%) of the meat consumers were married, (36.1%) were single, (1.3%) were widow, and the remaining percentage (2.5%) Divorced. The marital status of the consumers shows that majority of the consumers are having a sense of responsibility and it also shows that meat is a means of livelihood for most people. Level of education therefore refers to the stage of formal education in which an individual was able to achieve. The result shows that a substantial number of meat consumers (51.1%) have secondary education, (44.9%) have tertiary education, (2.5%) have primary education, and (0.6%) have no formal education. The Primary occupation of the head of household (defined as the major wage earner) is the traditional index by which the social class of a respondent has been determined. The result shows that about (38.6%) of the meat consumers were practicing Trading as their primary occupation, (11.7%) were civil servant, (8.2%) were Artisanship, (25.6%) were teachers, (16.2%) are farmers, and the remaining percentage (7.7%) are Others (i.e., Other Businesses). The result shows that the meat Consumers are mostly traders, which can afford to buy produce at any cost.

Factors that Influence Meat Quality Characteristics on Price

Commodity pricing formula takes into account the quality traits possessed by a particular commodity because quality traits form the basis of consumers' purchasing decisions. Therefore, variation in meat type's prices is justifiable due to the differences in the number of quality characteristics possessed by various meat type. The results of the analysis are presented in Table 5 with price as dependent and meat quality characteristics as independent variables.

Table 3: Hedonic Regression for Meat attributes Affecting Price

Variable	Coefficient	Standard error	T-ratio
Constant	2257.7	2257.7	5.318
Colour(Without colour)	-181.50	322.8	-0.5622
flavor (Good)	286.161	117.153	2.443**
Taste (Good)	269.744	156.378	1.725**
Nutritional value (High)	78.296	293.7	0.2666
Packaging (Not well pack)	-260.69	298.5	-0.8734
Appearance (old)	-60.833	367.5	-0.1655
Amount of fat (High)	- 358.28	156.87	-2.283***
Availability (Not always available)	40.026	309.2	0.1295

Source: Field Survey 2021

R-Square = 0.7085 R-Square Adjusted = 0.6803

*** Significant at 0.01

** Significant at 0.05

* Significant at 0.10

The results of the analysis are presented in Table 3 with price as dependent and meat characteristics as independent variables. Meat flavour (Good) was the reference group while meat with bad flavour was entered as dummy variables and the result shows that meat with good flavour was statistically significant at (P< 0.05) with positive coefficient implying that for any unit increase in these variables, buyers would be willing to pay premium because they showed higher significant buyer preference level. Meat with good taste was the reference group, and tasteless meat was entered as the dummy variables and results shows that meat with good taste was statistically significant at (P< 0.05) with positive coefficient this implying that meat with good taste are point of interest for the consumers and they are ready to pay high premium to buy the commodities with this attributes. This is lined with the reports of Adetunji and Rauf (2012) in their study found that respondents' preference for meat was influenced by their taste and level of income. It also shows that amount of fat (high) was found to be statistically significant with a negative coefficient, implying that meat with low fat is more preferable and are selling at higher prices in the study area

Kendall's Coefficient of Concordance Analysis on Constraint Associated with Meat Consumption

The *K*endall's coefficient of concordance (W*)* was used to evaluate the constraint associated with meat consumption. W is an index that measures the ratio of the observed variance of the sum of the ranks to the maximum possible variation of the ranks. *T*he idea behind this index is to find the sum of the ranks for each problem that has been ranked. Results of Kendall's W are presented in table 6, where value of W (0.68) was highly significant at 1% significance level, and implies a high level of agreement among the respondents in ranking the constraints associated with meat consumption.(Note: Mean importance is calculated with the values of 1 for most important and 7 for least important. Hence, a lower mean indicate a greater importance).

Table 4: Description of Constraints Associated with Meat Consumption

Variables	Mean Rank	Rank
Low income of consumer	3.01	1st
High selling price	3.63	2nd
Poor storage facility	4.48	7th
High level of poverty	4.34	5th
Level of education	4.22	4th
Household size	4.41	6th
Food safety	4.20	3rd

Source: Field Survey 2021

Results shows that, low income of consumer was the highest constraints associated with meat consumption in the study area, with a mean rank of 3.01, followed by high selling price with the mean rank of 3.63 and food safety with 4.20. Household size and poor storage facilities were the least ranked or lowest constraints affecting the consumers of meat in Kano metropolis.

CONCLUSION AND RECOMMENDATIONS

Demand for animal products in Kano Metropolis follows patterns familiar to Nigeria and many developing countries in that it employs informal markets, has an income sensitive character and varies by location (urban and rural). Its characteristics with reference to food quality and safety and familiar from studies of developed countries as well, in that consumers seek out, can identify, and are willing to pay for quality and safety. Based on the outcome of the research, it was now recommended that efforts should be made by the cooperate organizations and developmental partners to sensitize the meat marketers on the attributes consumers pay more attention to in order to gain more premium, income generation and satisfy the needs of the consumers. Meat marketers should also make provision within themselves to provide basic amenities that would ease their marketing activities. Consumer should form cooperative society so that they can contribute money together that will enable them to purchase cattle in large number and slaughter for sale at cheaper rate for members.

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