

## **Environmental pollution and its influence on consumers' perception of pork and poultry meat consumption in Calabar South, Cross River State**

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### **Abstract**

This study assessed environmental pollution and its influence on consumers' perceptions of pork and poultry meat consumption in Cross River State, Nigeria. The Multi-stage sampling procedure was used in selecting fifty (50) pork and poultry meat consumers for the study. Data collected were analyzed using descriptive/inferential statistics and a probit regression model. The result showed that the educational level of the consumers had a negative coefficient and was statistically significant at 5%. The coefficients of age, marital status, source of market, and occupation of the consumers were positive as expected but were not statistically significant at 5%. Gender and quantity per household were negative and significant at 10%. Also, the sign of the determinant factor and price of pork and poultry meat did not comply with a priori expectation while the coefficient of the quantity per household and religion were negative and were not significant. Hence, the study recommends the need for proper education and enlightenment since a lesser percentage of the people who attribute their non-consumption of pork and poultry to religion, tribe, and health reasons are not fully educated. It was, therefore, concluded that consumer's perception of pork and poultry could, to a large extent, be influenced by age, marital status, and occupation.

**Key words:** Environmental pollution, pork, poultry, consumer's perception.

### **INTRODUCTION**

One of the greatest problems confronting millions of Nigerians today is the lack of adequate protein, both in quality and quantity, to cater to the nation's ever-growing population (Simmons, 1980). In Calabar South, pork and poultry meat, which are the two major dietary protein sources available to the people, are influenced by certain factors like income, price, taste, religion, tribe, and other environmental

factors (pollution, waste disposal, etc.). Studies have proven that environmental pollution and sewage/waste disposal have, to a large extent, influenced the consumption of pork and poultry meat, resulting in a decreased intake of animal protein (Akinbile and Omotara, 2000). According to nutritionists, pork, poultry, and other related products of animal origin are needed by the body for growth, repairs, and general

maintenance of the body tissues, and poor intake could result in diseases like kwashiorkor and brain malfunctioning, amongst others (Olusimbo and Nwachukwu, 2023).

According to Williams (2022), poor animal protein intake has resulted in infant mortality, pronounced malnutrition, diseases, and reduced human productivity. Hence, this paper seeks to investigate the influence of consumers' perceptions on pork and poultry meat consumption in Cross River State.

In line with the Theory of Reasoned Action (TRA), human food choice is a complex phenomenon with many factors having an effect on which foods are eaten by an individual. Van Doorn (1975) investigated the relationship between beliefs, attitudes, and behavior and developed a structured attitude model. This model, labeled the TRA, has proved useful in the prediction of future eating patterns for several types of foods. He argued that beliefs should not be assessed as directed towards an object but should be assessed as directed towards behavior.

The TRA seeks to explain rational behavior that is under the control of the individual, that is, volitional behavior. Limitations associated with this model are that of control. This model assumes volitional behavior, which, of course, is not the case in many consumption situations. Others are that the model does not explicitly deal with choice problems and that individuals' intentions are assessed when it is impossible to have all of the necessary information.

In this study, the subjects are the main purchasers and those responsible for preparing meals in the household by whom the products are regularly purchased. Therefore, these limitations should have minimal impact as these respondents are relatively well informed, and buying and

consumption behavior should be under their control (Williams, 2022).

Several researchers have applied this model to consumer behavior towards food products and have found that the model is a relatively good predictor of food consumption behavior. In most cases, the attitude towards the behavior was more important in the prediction of food consumption behavior. Ahmad *et al.* (2003) reported significant correlations between all the model components and identified taste and health as the most important predictors of the attitude toward meats and poultry. Magbagbeola (2001) observed that nutritional and health concerns were important predictors of intentions to eat beef in the future.

However, the revealed preference hypothesis assumes the rationality, transitivity, and consistency of human behavior, as he indicates a preference for the quantity of a particular commodity that best satisfies him. This theory assumes that the consumer is rational and, as such, will indicate a preference for the quantity of a particular commodity that best satisfies him (Kuo and Lin, 2003). He is also consistent in the choice of a particular commodity, and could prefer inferior but lesser quantities of these commodities no matter the situation and there is transitivity of choice. However, in this theory, it is believed that when a consumer buys a certain quantity of goods, he reveals his preference for those goods as against others available to him. Consequently, a consumer will at no time prefer less preferred goods (Onasanya, 2018)

## RESEARCH METHODOLOGY

### Study area

This research work was carried out in Calabar South, Cross River State. Calabar, fondly referred to as Canaan City by indigenes, is situated between latitude 4°18

and 5°21'N of the equator and longitude 8°18' and 8°19' E of the Greenwich meridian (National Population Commission (NPC), 2006), and it's about 600 feet above sea level. It has a mean yearly rainfall ranging from 3000 - 4000 mm and an annual temperature of between 35 - 37°C, thus, it lies within the wet humid tropics. The topography is mostly flat and is bordered by two big rivers: Cross River State and Atimbo River. The population of Calabar South LGA is 4 million, comprising 49.97% males and 50.03% females (Cross River State Geological Survey Agency, 2010). The area is occupied with the favorable climate of tropical, humid, dry, and wet seasons, which gives rise to rich agricultural lands.

#### Population of the study area

The population of Calabar south local government area was estimated at 191,630 persons with a land area of 264km<sup>2</sup> (National population census, 2006). However, as of 2022, the population increased to 291,700 persons with a land area of 1,546/km<sup>2</sup> (Cross River State Geological Survey Agency, 2010). Forty percent of the estimated population constitutes the active population that is engaged in various economic activities ranging from subsistence agriculture to urban commerce and transport business. Agriculture currently employs about 80% of the State's labor force and contributes about 40% to the Gross Domestic Product (GDP).

#### Sampling procedure and sample size

A multi-stage sampling procedure was used for the study. Purposively, one (1) LGA out of two (2) LGAs considered as the political headquarters of Cross River State was selected on the basis that pork and poultry meat are mostly consumed in the area. Next was the random selection of three (3) villages from the eleven (11) local government wards, followed by the random selection of seventeen (17) respondents

(majorly pork and poultry meat consumers). This gave a total of fifty-one (51) respondents, which constituted the sample size for the study. However, a total of fifty (50) questionnaires were finally retrieved/collected from the respondents and used for this study.

#### Data Collection and Analysis

Data for the study were collected mainly from primary sources. Descriptive statistics, such as frequency counts and percentages, inferential statistics, and a probit regression model, were used to analyze data. The mean was computed as;

$$\text{Mean } X = \frac{\sum N}{X}$$

Where: N = Number of observations;  
 $\sum X$  = Summation of the observations.

$$\text{Standard deviation } \delta = \sqrt{\frac{\sum (X - \bar{X})^2}{N}}$$

Where,  $\delta$  = Standard deviation

X = Observations

N = Number of observation

The probit regression model was expressed as:  $Y = b_0 + b_1X_1 + e_t$ .

Where Y is a dichotomous dependent variable which can be explained as Y (Pork = 1, if consumers default, Poultry = 0, if consumers do not default);

$b_0$  = Intercept

$b_1$  = Regression coefficient that explains the probability of default of both pork and poultry consumers

$e_t$  = Error (disturbance) term.

Hence, the model is implicitly stated as:  $Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, e_t)$

Where Y = Consumption choice of pork and poultry meat.

$X_1 - X_7$  = Independent variables specified as

factors that influence pork and poultry consumption, stated as;

X<sub>1</sub> = Solid waste (kg);

X<sub>2</sub> = Effluents (%);

X<sub>3</sub> = Price (₦ per kg of Pork and poultry)

X<sub>4</sub> = Income (₦)

X<sub>5</sub> = Taste; Nutritious=1; not nutritious =0

X<sub>6</sub> = Religion; Christianity= 1; Islam =0

X<sub>7</sub> = Quantity of meat (pork or poultry) consumed per household (kg);

et = Error (disturbance) term; X<sub>1</sub>– X<sub>7</sub> are as defined.

## Results and discussion

### Demographic characteristics of the respondents

The result, as seen in Table 1, showed that most of the respondents (consumers of pork and poultry meat) were within the age ranges of 21 - 55 years and constituted 80% of the sampled population. The majority of the respondents were females (36%), while the male population was 64%. The results also indicated that 30% of the respondents were single, 50% were married, and 20% were either widows or divorced. On religion, 80% of the respondents were Christians, while 20% were Muslims. The educational level of the respondents showed that 10% of the respondents had no formal education, 40% attended an adult literacy programme, A lesser percentage (20%) had primary education, while 30% had higher education. On the occupation of the respondents, the result showed that 40% of the students and 60% of the working class consume pork and poultry meat. In addition, considering both the taste and religion of the meat consumers in the area, the majority of consumers of these meats (70%) were Christians while only 30% of the respondents who were of the Islamic religion consumed these meats. This was so owing to the belief of the

Moslem concerning pork consumption. Also, about 80% of the respondents were seen to consume these meats owing to their nutritious value in the area. This is in line with the study of Kuo and Lin (2003).

### Environmental pollution as it influences consumers' perception of consumption

The probit regression model was used to determine factors influencing pork and poultry consumption among consumers in Cross River State. The probit model explained the probability of pork and poultry consumption as a result of any of the seven (7) identified independent variables used in determining largely the impact of each variable on consumption. The model has a good fit and is significant at 10%.

Results revealed that effluents had a negative coefficient and were statistically significant at 10%. This indicates that there is an indirect relationship between effluents and meat consumption patterns, therefore, an increased effluent in the area will decrease the probability of the consumers' defaulting in consumption. The signs of the coefficient of solid waste, taste, price, income, and religion were positive as expected but not statistically significant at 5%. This indicates that there is a direct relationship between these independent variables and meat consumption, hence, an increase in any of these variables will increase the probability of the consumers' defaulting in the consumption of meat. This study conforms with studies carried out by Ngan, Zajima *et al.*, (2016)

Also, the coefficients of price and income were positive and significant at 5% based on a priori expectation, while the coefficient for determinant factor and quantity per household were negative, implying an indirect relationship. This indicates that the consumers' household size and their religious beliefs may reduce the probability of defaulting in consumption.

The adjusted  $R^2$  of 0.55 indicated that the explanatory variables fitted explained 55% of the variation in the dependent variable.

### Conclusion/recommendations

In conclusion, the environmental pollution associated with the consumption of pork and poultry meat in the area cannot be overemphasized. Effluents, including sewage/waste disposal, significantly influenced consumers' perceptions of meat consumption in the area. Also, consumer's perception of pork and poultry could to a large extent be influenced by age, marital status and occupation. However, the study suggests the need for proper education and enlightenment since a lesser percentage of the people who attribute their non-consumption of pork and poultry to religion, tribe, and health reasons are not fully educated.

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Table 1: Frequency distribution of the respondents according to demographic characteristics

| Variable                      | Frequency | Percentage |
|-------------------------------|-----------|------------|
| <b>(a) Sex</b>                |           |            |
| Male                          | 32        | 64         |
| Female                        | 18        | 36         |
| Total                         | 50        | 100        |
| <b>(b) Age (years)</b>        |           |            |
| 21-25                         | 5         | 10         |
| 26-35                         | 17        | 34         |
| 36-45                         | 13        | 26         |
| 46-55                         | 10        | 20         |
| Above 55                      | 5         | 10         |
| Total                         | 50        | 100        |
| <b>(c) Religion</b>           |           |            |
| Christianity                  | 40        | 80         |
| Islam                         | 10        | 20         |
| Total                         | 50        | 100        |
| <b>(d) Marital status</b>     |           |            |
| Single                        | 15        | 30         |
| Married                       | 25        | 50         |
| Widowed/Divorced              | 10        | 20         |
| Total                         | 50        | 100        |
| <b>(e) Level of education</b> |           |            |
| No formal education           | 5         | 10         |
| Primary education             | 10        | 20         |
| Higher education              | 15        | 30         |
| Adult literacy education      | 20        | 40         |
| Total                         | 50        | 100        |
| <b>(f) Occupation</b>         |           |            |
| Students                      | 20        | 40         |
| Teachers (staff)              | 30        | 60         |
| Total                         | 50        | 100        |
| <b>(g) Other factors</b>      |           |            |
| Religion                      |           |            |
| Christianity                  | 35        | 70         |
| Islamic                       | 15        | 30         |
| Total                         | 50        | 100        |
| <b>(h) Taste</b>              |           |            |
| Nutritious                    | 40        | 80         |
| Not-nutritious                | 10        | 20         |
| Total                         | 50        | 100        |

Source: *Computed from field survey, 2024.*



Table 1: *Contd...*

| Variable                                          | Frequency | Percentage |
|---------------------------------------------------|-----------|------------|
| <b>Hindering Factors</b>                          |           |            |
| Price factor                                      | 20        | 40         |
| Scarcity                                          | 10        | 20         |
| Cultural value                                    | 5         | 10         |
| Taboo                                             | 10        | 20         |
| Scarcity, cultural value                          | 5         | 10         |
| Total                                             | 50        | 100        |
| <b>(i) Source of pork and poultry</b>             |           |            |
| Market                                            | 20        | 40         |
| Cafeteria                                         | 15        | 30         |
| Beer parlor                                       | 10        | 20         |
| Rearing                                           | 5         | 10         |
| Total                                             | 50        | 100        |
| <b>(j) Form of pork and poultry eaten</b>         |           |            |
| Fried                                             | 10        | 20         |
| Roasted                                           | 5         | 10         |
| Cooked as stew                                    | 10        | 20         |
| Fried, cook                                       | 25        | 50         |
| Total                                             | 50        | 100        |
| <b>(k) How often is pork and poultry consumed</b> |           |            |
| Weekly                                            | 25        | 50         |
| Monthly                                           | 10        | 20         |
| Occasionally                                      | 10        | 20         |
| Seasonally                                        | 5         | 10         |
| Total                                             | 50        | 100        |

*Source: Computed from field survey, 2024*

Table 2: The Probit model

| Independent variable | Regression | Standard error | Probability |
|----------------------|------------|----------------|-------------|
|----------------------|------------|----------------|-------------|

|                                          | coefficient |          |         |
|------------------------------------------|-------------|----------|---------|
| Intercept                                | -1.60       | -1.57    | -1.016  |
| Solid waste                              | 0.07        | 0.026    | 2.73*** |
| Taste                                    | 0.076       | 0.276    | 0.27    |
| Effluents                                | -0.0004     | 0.00025  | -1.73*  |
| Price                                    | 1.71E-05    | 8.18E-06 | 1.98**  |
| Income                                   | 0.565       | 0.527    | 1.07    |
| Religion                                 | 0.0010      | 0.053    | 0.019   |
| Quantity of meat consumed per household; | -0.118      | 0.085    | -1.39   |

SPSS result output data (2024). Standard error of the regression = 0.430819; Log likelihood = -45.70794; Restricted log likelihood = -59.16886; L.R. Statistics (10 df) = 26.92184; Prob. (LR stat.) = 0.019709%. \*\*\* implies that p-value is significant at 1%; \*\* implies that p-value is significant at 5%; \* implies that p-value is significant at 10%; Adjusted  $R^2$  = 0.552.

Source: *Computed field survey, 2024*