EGG DEMAND ANALYSIS AMONG UNDERGRADUATE STUDENTS OF THE UNIVERSITY OF BENIN, BENIN CITY, NIGERIA

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BENIN CITY

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A PROJECT SUBMITTED TO THE DEPARTMENT OF AGRICULTURAL ECONOMICS AND EXTENSION SERVICES, FACULTY OF AGRICULTURE, UNIVERSITY OF BENIN, BENIN CITY IN PARTIAL FULFILLMENT FOR THE REQUIREMENTS FOR THE AWARD OF BACHELOR'S DEGREE IN AGRICULTURE (OPTION: AGRICULTURAL ECONOMICS AND EXTENSION SERVICES)

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CERTIFICATION

This is to certify that the research work on **EGG DEMAND ANALYSIS AMONG UNDERGRADUATE STUDENTS OF THE UNIVERSITY OF BENIN, BENIN CITY, NIGERIA** was carried out by **Theodore Osakpolor OSARENORIABE (Mr)** with the Mat. No **AGR1900063** under the supervision of the department of Agricultural Economics and Extension Services, Faculty of Agriculture, University of Benin, Edo State, Nigeria.

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Prof. J. I. Egbodion
(Department Head of Agricultural Economics and Resource Management)

DEDICATION

This project is dedicated to God Almighty for his grace and enablement leading to the successful completion of this project. I would also like to dedicate this project to my mother, Mrs V. AMAYO for her undying love and support through the rigors of completing this project.

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ABSTRACT

Egg consumption plays a crucial role in maintaining a balanced. Students' food choices are often influenced by socio-economic factors, price fluctuations, and availability of alternative protein sources. Despite the nutritional benefits of eggs, limited studies have examined demand for egg and the determinants of consumption among university undergraduates in Nigeria. Hence this study was conducted to examine egg demand among undergraduate students at the University of Benin, Benin City, Nigeria. To achieve this, the specific objectives were to describe the socio-economic characteristics of egg consumers, evaluate the level of egg consumption relative to other animal protein sources, determine the nature of eggs consumed, and identify key factors influencing egg consumption.

A stratified random sampling technique was used to select 100 students from 219 400 students of the 6 departments consisting of AEE, AFM, ANS, CRS, FWM and SLM. Both primary and secondary data were used for the study.the primary data were collected using a structured questionnaire. The secondary data were obtained from journals, articles, textbooks and the internet.

The results indicated that over half of egg consumers were female (56%), while the other half were male (44%) with a mean age of 23 years and majority within the age bracket of 21-25 years (79%). Majority of undergraduate consumers resided off campus (76%). The mean budget share for egg consumption was 0.38,

making it the most consumed protein source followed by fish (0.25), beef (0.15), chicken (0.10), and milk (0.10). Egg consumption was highest among students in the Forestry and Wildlife Management (0.44), Crop Science (0.43), and Animal Science (0.39) departments, with the lowest consumption recorded in Soil and Land Management students (0.31). Regression analysis revealed that egg consumption was significantly influenced by the price of substitute protein source. An increase in beef prices also led to decreased egg consumption, confirming complementary effects. Furthermore, total protein expenditure was a key determinant of egg consumption indicating that students who spent more on protein allocated a larger portion of their budgets to eggs. Gender was also significant with male students spending more on eggs than female students. However, the prices of eggs, milk, fish, chicken, and pork were not significant predictors, implying that prices of these protein sources do not strongly influence students' egg consumption patterns. The study recommends that universities promote awareness campaigns on the nutritional benefits of eggs and other protein sources to encourage balanced diets and egg consumption. Policymakers should work towards stabilizing egg prices to enhance affordability for students. Additionally, university food vendors should ensure the availability of eggs in various forms to cater to students' dietary preferences.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background of the Study

Egg is an important source of animal protein. As one of the few food products consumed with no geographical or religious restrictions, it has always played a key role in the human diet. The high digestibility of egg proteins, along with their content of indispensable amino acids is just one of the numerous benefits of egg in human nutrition (Mine *et al*., 2023). Egg has some immuno-modulatory, anti-inflammatory, antioxidant, anticancer, and anti-hypertensive properties in addition to its bioactive components which include lipids, vitamins, proteins, and derived hydrolytic peptides (Chang *et al*., 2018). It is claimed that egg consumption may protect individuals against metabolic syndromes by increasing High-density lipoprotein Cholesterol (HDL-C) levels and reducing inflammation. (Sanlier and Üstün, 2021). Wallace (2018) suggested that there seemed to be clear scientific evidence to suggest that both choline and lutein which are found in eggs, play a vital role in brain and neurological development during the first 1000 days post conception. The extent to which higher intakes of choline have the potential to enhance or influence cognition during childhood, adulthood, and/or age-related cognitive decline needs further investigation. Emerging but consistent research suggests that lutein has the potential to influence cognition across the lifespan and

that sufficient intakes during mid to late adulthood may help to ward off age-related cognitive decline.

The composition of an egg is diverse, with the shell accounting for 11% of its total content, the yolk making up 31%, and the white comprising 58%. The yolk and white have distinct contents, with lipids concentrated in the yolk. Eggs are a nutrient-dense food, containing a range of vital components such as vitamins, minerals, high-quality protein, phospholipids, sphingomyelin, lutein, and zeaxanthin (Park *et al*., 2018). Notably, the protein in eggs has a high biological value, with 94% of it being utilized by the body and converted into essential body proteins, earning it the reputation as a "Sample protein". (Nimalaratne and Wu, 2015).

Eggs may arguably be the most readily available and cost-effective protein source with a wide range of uses due to their versatility. They are used as an ingredient in many culinary and industrial contexts, such as baking and the production of ice cream and other confectioneries. Eggs are also very easy to prepare, with boiling, frying, or stewing as the main preparation methods and commercially raised chicken being the main supply source. Also, eggs are believed to have spiritual power, and as a result, they are used in specific traditional rituals during festive occasions or in times of necessity. (Ayim-Akonor *et al*, 2014)

Global egg consumption varies significantly. Mexico, Malaysia, and Japan have the highest *per capita* consumption, with over 329 eggs per person annually. In

contrast, India and Ghana have much lower consumption rates, with 63 and 12 eggs per person per year, respectively. The difference in egg consumption is mainly influenced by a country's economic prosperity and technological advancement in its egg production industry. (Bertechini, 2017)

In Nigeria, available records indicate that in 2020, the average egg consumption per person per year was estimated to be around 78 eggs, contrasting with consumption rates in countries such as the United States of America and South Africa which recorded 285 eggs per person per year and 128 eggs per person per year respectively (Food and Agriculture Organization, 2022; United States Department of Agriculture, 2022).

The projected egg consumption in Nigeria is expected to have increased by 1.0% from the 2021 consumption. Nigeria has experienced a steady yearly growth of egg demand by 0.6% since 2017, FAO (2023).

1.2 Problem Statement

Egg consumption is an important aspect of a balanced diet, particularly for university undergraduate students in Nigeria. These young adults are at a critical stage of their lives, where their dietary habits can have a significant impact on their academic performance and overall health. (Amoaning *et al*., 2022). Ozkok (2015) noted that undergraduate students in Nigeria, especially those living on university campuses, form a distinct group regarding food consumption. When they move from their family homes to a more autonomous way of living, these

young individuals often take charge of their dietary decisions, which can vary greatly from their earlier eating patterns. Research findings indicate that the eating habits of college students, particularly their intake of eggs, can impact their academic performance (Reuter *et al*., 2021).

However, despite the crucial benefits of egg in the diet of university undergraduates students, it's consumption pattern among this demographic appears to be inconsistent and influenced by various factors. Research indicates that misconceptions surrounding dietary cholesterol and health risks contribute to the variability in egg consumption among young adults. For instance, while some students recognize the health benefits of eggs, others avoid them due to misinformation, which can lead to inadequate nutrient intake. Additionally, factors such as gender, relative price of other protein sources, and socioeconomic status noticeably influence these consumption patterns. Female students generally consume more eggs than male students, and those who engage in regular physical activity are more likely to include eggs in their diets (Giannetto *et al*.,16). The lack of empirical evidence on the socioeconomic characteristics, consumption patterns, and determinants of egg consumption among this demographic limits the ability to optimize egg production, distribution, and pricing, potentially resulting in market inefficiencies and untapped economic opportunities.

This study therefore will attempt to answer the following research questions;

i. What are the socio-economic characteristics of egg consumers among undergraduate students of the University of Benin, Benin City, Nigeria?

ii. What are the current levels of egg consumption in relation to other animal protein among undergraduate students in the University of Benin, Benin City, Nigeria?

iii. What is the nature of Egg consumed by undergraduates' students of the University of Benin, Benin City, Nigeria?

iv. What are determinants of Egg consumption among undergraduates' students of the University of Benin, Benin City, Nigeria?

1.3 Objective of Study

The main objective of this study is to identify egg consumption patterns among university undergraduates in The University of Benin. The specific objectives are to:

i. to describe the socio-economic characteristics of egg consumers among undergraduate students of the University of Benin, Benin City, Nigeria.

ii. to examine the current level of egg consumption in relation to other animal protein sources among undergraduates students in the University of Benin, Benin City, Nigeria.

iii. to describe the nature of Egg consumed by undergraduate students in the University of Benin, Benin City.

iv. to Examine the determinants of egg consumption among undergraduate students of the University of Benin, Benin City.

1.4 Justification of the Study

This study aims to investigate the socio-economic characteristics, levels of egg consumption, and factors influencing egg consumption among undergraduate students of The University of Benin, Benin City, Nigeria. Despite the importance of eggs as an affordable and nutritious source of protein, there is a paucity of research on egg consumption patterns among young adults in Nigeria.

Existing literature has primarily focused on egg consumption patterns among general populations, households or specific age groups, with limited attention to the unique characteristics and influences shaping dietary decisions among university undergraduates. Furthermore, the current economic and cultural context of Nigeria necessitate an updated understanding of egg consumption patterns among this demographic.

A significant knowledge gap exists regarding the socio-economic characteristics of young egg consumers, the relative preference of eggs within protein sources consumed, and the impact of expenditure on egg consumption decisions among university undergraduates. Additionally, there is inadequate exploration of certain other potential factors influencing egg consumption, such as health awareness and/or misconceptions, cultural influences and food preferences.

This study looks to address these gaps by providing insights into egg consumption patterns, factors influencing consumption, and socioeconomic characteristics of undergraduate egg consumers in The University of Benin. The findings will contribute to informing nutrition education programs and health interventions targeting young adults, supporting evidence-based policies for promoting egg production and consumption, and enhancing understanding of dietary decisions among Nigerian university undergraduates.

By exploring the complex relationships between socio-economic factors, egg consumption, and dietary decisions, this study will provide valuable contributions to the existing body of knowledge on egg consumption patterns. Ultimately, this research will inform strategies for promoting healthy eating habits, sustainable food systems, and improved nutrition among young adults in Nigeria.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1. Conceptual framework

2.1.1. History and concept of Egg consumption

Chickens and man have coexisted for several millennia. Humans keep chickens primarily as a source of food, consuming both their meat and eggs. Chickens (Gallus domesticus) possess a long history, showing variations while tracing its origin. Its use for food was evident during the Roman Empire which is credited with the development of breeds, especially for egg production. (Elson, 2011). Some of these breeds have contributed to those used in current chicken production. More than 50 billion chickens are raised annually as a source of food, for both their meat and eggs. Chickens raised for eggs are usually called layers while chickens raised for meat are often called broilers. On average a laying hen produces one egg/day. All laying hens start to lay exactly when they are 21 weeks old. Planning is therefore required for egg production to be constant so as to meet market demand. In areas where the climate is hot and humid, commercial hybrid laying hens produce on average between 180 and 200 eggs/year. In more temperate climates laying hen can produce on average between 250. Chicken eggs are widely used in many types of dishes, both sweet and savory, including many baked goods. Some of the most common preparation methods include scrambled, fried, poached, hard-boiled, soft-boiled, omelette, and pickled. They also may be

eaten raw, although this is not recommended for people who may be especially susceptible to salmonellosis, such as the elderly, the infirm, or pregnant women. In addition, the protein in raw eggs is only 51 percent bioavailable, whereas that of a cooked egg is nearer 91 percent bioavailable, meaning the protein of cooked eggs is nearly twice as absorbable as the protein from raw eggs. (Evenepoel *et al*, 1998). As a cooking ingredient, egg yolks are an important emulsifier in the kitchen, and are also used as a thickener, as in custards.

The albumen (egg white) contains protein, but little or no fat, and may be used in cooking separately from the yolk. The proteins in egg white allow it to form foams and aerated dishes. Egg whites may be aerated or whipped to a light, fluffy consistency, and often are used in desserts such as meringues and mousse.

2.1.2 Concept of dietary habits

Dietary habits refer to the choices and patterns of food consumption that individuals or groups follow, influenced by cultural, social, economic, and biological factors. These habits play a critical role in overall health, affecting the risk of chronic diseases such as obesity, diabetes, and cardiovascular disorders (Willett *et al*., 2019).

One significant factor influencing dietary habits is culture. Different regions have distinct cuisines that shape individuals' food preferences and nutrient intake. For instance, Mediterranean diets rich in fruits, vegetables, olive oil, and lean protein are associated with lower risks of heart disease (Estruch *et al*., 2018). Similarly,

Asian diets, which emphasize rice, fish, and plant-based foods, contribute to longevity and reduced incidences of metabolic disorders (Ng *et al*., 2020).

Socioeconomic status also plays a crucial role in dietary choices. People with higher incomes generally have better access to nutritious foods, while those with lower incomes often rely on processed, high-calorie foods due to affordability (Darmon & Drewnowski, 2015). Additionally, dietary habits are influenced by psychological and environmental factors, such as stress, food availability, and marketing strategies (Swinburn *et al*., 2019).

Understanding and promoting healthy dietary habits through public health policies and education is essential in combating malnutrition and diet-related diseases worldwide.

2.1.3 Dietary habits of University students

Dietary habits among university students are shaped by multiple factors, including academic stress, financial constraints, social influences, and accessibility to nutritious food. This period is often marked by a transition from parental supervision to independent food choices, which can significantly impact students' health and well-being (Croll *et al*., 2001).

One of the primary challenges university students face is the prevalence of unhealthy eating patterns, such as frequent consumption of fast food, skipping meals, and reliance on processed or convenience foods (El Ansari *et al*., 2021). Studies have shown that many students do not meet the recommended intake of

fruits, vegetables, and essential nutrients, leading to an increased risk of obesity, malnutrition, and diet-related diseases (Musaiger *et al*., 2019). Financial constraints also play a critical role in shaping dietary habits. Many students, particularly those living away from home, struggle with food affordability, leading them to opt for inexpensive but often less nutritious options (Larson *et al*., 2020). Additionally, academic stress and time constraints contribute to irregular eating patterns and increased consumption of high-calorie, low-nutrient snacks (Papadaki *et al*., 2022).

2.2 Theoretical framework

2.2.1 Theory of Consumer demand

The theory of consumer demand is a fundamental concept in economics that explains how individuals allocate their limited resources to purchase goods and services that maximize their satisfaction. This theory provides insights into consumer behavior, utility maximization, and market demand. Several key theories and models have been developed to explain consumer demand, including the law of demand, utility theory, and indifference curve analysis (Varian, 2014).

2.2.2 The Law of Demand

The law of demand states that, all else being equal, an increase in the price of a good leads to a decrease in its quantity demanded, and vice versa (Mankiw, 2020).

2.2.3 Elasticity of Demand

Elasticity measures the responsiveness of demand to changes in price, income, or other factors.

- **Income Elasticity of Demand**: Income elasticity of demand (Ƞ) measures how the quantity demanded of a good or service changes in response to a change in income. It is calculated as the percentage change in quantity demanded divided by the percentage change in income.

  The formula is: $\eta = \frac{\%\Delta q}{\%\Delta I}$

  Interpretation:

  If Ƞ > 1, the good is luxury (demand increases more than income).

  If 0 < Ƞ < 1, the good is a necessity (demand increases less than income).

  If Ƞ < 0, the good is an inferior good (demand decreases as income increases).

- **Price Elasticity of Demand**: Price elasticity of demand (Ei) measures how the quantity demanded of a good or service changes in response to a change in its price. It is calculated as the percentage change in quantity demanded divided by the percentage change in price. The formula is:

  Price Elasticity of Demand (Ei) = $\frac{\%\Delta qi}{\%\Delta Pi}$

  Interpretation:

  If $Ei > 1$, demand is elastic (demand changes more than the price change, consumers are sensitive to price changes).

If Ei= 1, demand is unit elastic (demand changes exactly as much as the price change).

If Ei < 1, demand is inelastic (demand changes less than the price change, consumers are less sensitive to price changes).

If Ei = 0, demand is perfectly inelastic (quantity demanded does not change at all, regardless of price).

If Ei = ∞, demand is perfectly elastic (consumers will only buy at one specific price, and any price change causes the quantity demanded to drop to zero).

- **Cross Price Elasticity**: Cross Price Elasticity of Demand (Eij) measures how the quantity demanded of a good or service changes in respect to the price of other commodities. Cross price elasticity helps to define whether two goods are complementary, substitute or independent.

  Cross Elasticity of Demand (Eij) is given as $=\frac{\%\Delta qij}{\%\Delta Pij}$

  If Eij > 0, is complementary

  If Eij = 0, is independent

  If Eij < 0, is substitutes

1. The substitution effect occurs when the price of a good changes, and consumers switch between similar goods that provide the same or similar utility. When the price of a good rises, consumers may substitute it with a

cheaper alternative. When the price of a good falls, consumers may buy more of the cheaper good, switching from alternatives.

2. The complementary effect refers to the change in the quantity demanded of a good when the price of a complementary good (a good that is often consumed together with another) changes. When the price of a complementary good rises, the demand for the other good tends to fall. When the price of a complementary good falls, the demand for the other good tends to rise.

2.2.4 Budget share

Budget share refers to the proportion of total expenditure allocated to a particular category within a given budget. It is a critical concept in economics, consumer behavior analysis, and policy-making, as it helps assess spending patterns and economic well-being. Budget share is often expressed as a percentage of total income or total expenditure.

Mathematically, budget share is calculated as:

$$Wi = \frac{PiQi}{m}$$

Where;

Wi = budget share of the i^{th} commodity

Pi= unit price of the i^{th} commodity

Qi = quantity demand of the i^{th} commodity

m = total expenditure of the consumer

Budget share is a valuable tool for analyzing consumption patterns, particularly in determining the priority given to specific expenditures. It helps reveal shifts in consumer behavior over time, influenced by factors such as income changes, price fluctuations, or evolving preferences. In the context of egg consumption, budget share serves as an indicator of how much households prioritize eggs in their overall food and nutritional intake. A higher budget share for eggs suggests they are a significant dietary component, whereas a lower share may indicate limited access, affordability issues, or a preference for alternative protein sources. Understanding budget share provides insight into egg consumption trends, affordability, and its contribution to meeting dietary needs.

2.2.5 Utility Maximization theory

Utility maximization theory is a fundamental principle in microeconomics that explains how consumers allocate their limited resources to achieve the highest possible satisfaction or utility. Rooted in rational choice theory, this concept assumes that individuals make consumption decisions to maximize their well-being, given their income and the prevailing prices of goods and services. The theory has been extensively developed through classical and modern economic thought, incorporating both cardinal and ordinal approaches to utility measurement. Utility represents the satisfaction or pleasure derived from consuming goods and services. Economists differentiate between:

- **Total Utility (TU)**: The total satisfaction obtained from consuming a certain quantity of goods or services.
- **Marginal Utility (MU)**: The additional satisfaction gained from consuming one more unit of a good or service.

2.3 Methodological Frameworks

2.3.1 Multiple Linear Regression (MLR) Model

Multiple Linear Regression (MLR) is a statistical technique used to model the relationship between one dependent variable and two or more independent (explanatory) variables. It extends simple linear regression, which involves only one independent variable, to scenarios where multiple factors contribute to the outcome. MLR is widely used in various fields, including economics, agriculture, social sciences, business, and engineering, to analyze and predict relationships between variables. The general form of the multiple linear regression equation is:

$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots, + \beta_n X_n + \varepsilon$

Where:

- Y is the dependent variable (outcome)
- β_0 is the intercept or constant term
- $\beta_1, \beta_2, \ldots, \beta_n$ are the coefficients of the independent variables
- $X_1, X_2, \ldots, X_n$ are the independent variables (predictors)
- ε is the error term (residual)

MLR helps in determining the relative importance of each independent variable in predicting the dependent variable and provides insights into how these variables interact.

2.3.2 Assumptions of Multiple Linear Regression

To ensure valid and reliable results, multiple linear regression relies on several assumptions:

- Linearity: The relationship between the dependent variable and each independent variable should be linear. This assumption ensures that changes in independent variables lead to proportional changes in the dependent variable.
- Independence: The observations should be independent of each other. This means that the value of the dependent variable for one observation should not be influenced by another.
- Homoscedasticity: The variance of the residuals (errors) should be constant across all levels of the independent variables. If variance differs significantly, it leads to heteroscedasticity, which can distort results.
- No Multicollinearity: Independent variables should not be highly correlated with each other. High correlation (Multicollinearity) can make it difficult to determine the individual effect of each variable.

- Normality of Residuals: The residuals (differences between observed and predicted values) should be normally distributed. This ensures valid hypothesis testing and confidence interval estimation.

2.3.3 Estimation of Regression Coefficients

The regression coefficients (β_0, β_1,....β_n) are estimated using the Ordinary Least Squares (OLS) method, which minimizes the sum of squared residuals:

$\sum(Yi - \hat{Y}i)^2$

Where:

- Yi is the actual value of the dependent variable

- $\hat{Y}i$ is the predicted value of the dependent variable

The OLS method provides estimates for the coefficients that best fit the observed data while minimizing the differences between observed and predicted values.

The estimated coefficients (β_0 β_1) indicate the change in the dependent variable (Y) for a one-unit change in the corresponding independent variable (X), holding other variables constant.

2.3.4 Goodness of Fit: Evaluating Model Performance

The effectiveness of an MLR model is assessed using several statistical metrics:

- R-Squared (R^2): Measures the proportion of variance in the dependent variable explained by the independent variables. Ranges from 0 to 1, with

higher values indicating better model fit. A value of 0.75 suggests that 75% of the variability Y in is explained by the model.

- Adjusted R-Squared: Adjusted R^2 accounts for the number of predictors in the model. Unlike R^2, it penalizes the inclusion of irrelevant variables. A model with a high adjusted R^2 and a low number of predictors is preferable.
- F-Test (Overall Model Significance): Tests whether at least one independent variable significantly affects the dependent variable. A significant F-statistic (p-value < 0.05) indicates that the regression model provides a better fit than a model with no predictors.
- p-Values for Individual Coefficients: Each regression coefficient has a p-value testing whether it is significantly different from zero. A p-value < 0.05 suggests a statistically significant relationship between that independent variable and Y.
- Standard Error of the Estimate: Measures the average deviation of observed values from the predicted values. Smaller values indicate better model fit.

2.4. Review of relevant literature

Numerous studies have investigated egg consumption, with research in Nigeria and elsewhere revealing significant patterns and influencing factors.

Obayelu *et al*, (2022) studied the demand of protein foods among students of the University of Ibandan, Ibandan, Nigeria. Data was collected from 300 students through a multi-stage sampling procedure and were analyzed using descriptive statistics and Quadratic Almost Ideal System model (QUAIDS). The results showed that some of the price coefficients expectedly had a negative relationship with the expenditures. He concluded that Demand for protein foods was influenced by own-prices of the protein foods, prices of other protein foods and being a male student. He recommended that in order to meet their daily dietary needs within a limited budget, students should substitute expensive protein sources like chicken, goat meat, beef and turkey with cheaper ones like groundnut, soymilk, beans and eggs in their diets.

Ojegele *et al*, (2024) investigated the consumption expenditure on animal protein in Osun State, Nigeria with a view of describing the Socio-economic characteristics of farming households consuming the selected animal protein foods studied. A probability sampling method was employed to randomly pick a sample size comprising 120 responders within the designated study area. The data revealed that a majority of household heads were male, with limited formal education, and primarily engaged in agricultural occupations. Data gathered from the participants was subjected to descriptive analysis techniques, including frequency distribution, percentage calculations, and the budget share index. The findings from this analysis revealed a significant influence of socio-economic

factors, including gender, marital status, and educational level, on the demand for animal protein foods within the studied households.

Jahns *et al,* (2017) studied time trend and pattern of egg consumption in the united states. The goal of this research was to describe time trends in frequency and amount of egg consumption and describe differences in egg consumption by sex, age, income, education, race-ethnicity, Supplemental Nutrition Assistance Program (SNAP) participation status, and food security status. Data on demographics and egg intake of 29,694 U.S. adults were obtained from the National Health and Nutrition Examination Survey, 2001–2012. The National Cancer Institute's usual intake methodology was used to estimate the distribution of egg intake. Linear and logistic regression models were used to test for time trends in egg consumption and for differences between socio-demographic groups. Results gotten indicated that the proportion of U.S. adults that reported consuming eggs on any given day remained unchanged from 2001–2002 to 2011–2012. However, mean egg consumption increased over this twelve year period, overall and among select socio-demographic groups, but not among nutritionally vulnerable food insecure individuals and SNAP participants. They further noted that further research was needed to examine factors that influence egg consumption and associated nutrient intake.

Giannetto *et al,* (2016) assessed the consumption of egg among the students of the University of Messina with the purpose studying and investigating the proper

eating style, focusing the attention on the propensity to “egg” consumption, in the diet of young people, with reference to the students attending the University of Messina. The data collection technique that was used consisted of the administration of a distributed anonymous ad hoc questionnaire by directly interviewing a sample of university students. In order to individualize the possible variables which may influence the frequency of egg consumption, a logistic regression model was used. The research results indicated that the only two statistically significant variables were the eating style and the reading of the product label.

Scudiero *et al* (2023) explored the socio-economic and food system determinants of chicken and egg consumption in India. The study analyzed household determinants of chicken and egg consumption within the Indian population, using two rounds of National Sample Survey data (1993–1994 and 2011–2012). By conducting a spatiotemporal analysis of household consumption and expenditure survey and by using truncated Double Hurdle and Unconditional Quantile regressions (UQR) models. The results highlighted that while consumption has increased marginally over twenty years, supply-side determinants, such as price and poultry production concentration, influenced heterogeneous consumption patterns in India.

Bejaei *et al,* (2011) studied the influences of demographic characteristics, attitudes, and preferences of consumers on table egg consumption in British

Columbia, Canada with the objective of identifying the associations between consumers' attitudes, preferences, and demographic characteristics with their consumption of different types of table eggs. An online survey was conducted to gather information from adult BC residents. Sixty-eight percent of the 1,027 randomly selected subjects completed the survey. Results of the survey indicated that, compared with consumers of white regular eggs, consumers of free-range eggs came from smaller households and had a higher education level and income. These consumers indicated that factors of health, nutritional value, environmental issues, and animal welfare were important in egg type selection. Although most consumers rated the specialty eggs as having a higher nutritional value than white regular eggs, price became the most important deciding factor for those consumers who selected white regular eggs.

A research carried out on factors affecting egg consumption among consumers by Kralik *et al,* (2020) provided valuable insights on attributes that consumers value when choosing and buying products, which can serve as a future guide for egg producers.

Ayim-Akonor and Akonor (2014) studied egg consumption patterns, preferences and perceptions among consumers in Accra metropolitan area. A structured self-administered questionnaire was used to collect information pertaining to patterns, preferences and perceptions from 448 participants. Close to 95% of the participants were found to be egg consumers. Their demographic indices did not

significantly ($p > 0.05$) influence consumption, except for age, with older respondents consuming less frequently. Size and price were the most influential indices that drive consumer purchase. Majority (47.6%) liked eggs from locally-bred chicken raised on free range basis better than that obtained from birds raised under confined conditions. Also, large sized, brown eggshell, and deep yellow yolk were most preferred. Boiled eggs were found to be the main food form patronized by consumers in the study area. More than half of the participants held the view that egg consumption results in an increase in serum cholesterol, even though this thought has not been sufficiently demonstrated scientifically. This study illustrates the need to publicize accurate information about the nutritional and health benefits of table eggs based on sound scientific evidence.

Pllana *et al,* (2015) examined the market of eggs, consumption, and consumer behavior in Kosovo.

Blum et al (2023) studied the social and economic factors influencing intra-household food allocation and egg consumption of children in Kaduna State, Nigeria. Methods included free-listing exercises, key informant interviews, in-depth interviews and FGDs. Results illuminated cultural rules that restrict egg consumption among children living in low-income households.

Islam *et al*, (2018) worked on consumer profile analysis towards chicken, beef, mutton, fish and egg consumption in Bangladesh. The study investigated the mean consumption frequency of chicken, beef, mutton, fish and egg, following

658 questionnaire survey results. The socio-demographic variables used in this study were: sex, age, gender, educational level, social class, number of family members in the home, the presence of minors less than 18 years in the home and geographical area. Egg was the most frequently consumed; 77 per cent of respondents ate egg once daily. Chicken was the second most consumed (62 per cent), whereas fish was third (59 per cent).

Iskender and Kanbay (2014) studied the determination of egg consumption habits of university students. The study sample consisted of 345 students (231 female and 114 male). Data were collected through face to face interview method by using the socio-demographic characteristics questionnaire and the form of characteristics of the egg consumption.

Mizrak *et al* (2012) analyzed the determination of egg consumption and consumer habits in Turkey. The aim of this study was to determine egg consumption habits in Turkey. Questionnaires prepared to determine habits regarding egg consumption were supplied to 2241 families. Sampling sizes and sample addresses were provided by the Turkish Statistical Institute. Data obtained through the questionnaires were analyzed using SPSS. Of the families that participated in the study, 98% consume eggs and the number of eggs consumed per person was 158 per year. In addition, 67.82% of the eggs consumed were purchased from supermarkets and 62.40% of the consumers pay most of their attention to the production date. The eggs were most often consumed in the

morning, at a percentage of 85.52%, and 70.28% of all of the eggs were boiled for consumption. Egg packaging has an impact on consumer choice at a rate of 67.46%, and eggs packaged in egg trays covered with plastic wrap are preferred at a rate of 58.26%. Eggs with deep yellow yolks were preferred by 81.20% of the families. It was also found that 72.42% of the families were not knowledgeable about organic eggs.

Panwal and Joseph (2023) analyzed the determinants of household egg consumption pattern in Wase local government area of plateau state, Nigeria. data were obtained through administration of questionnaire on 108 respondents. The data were analyzed through the combination of descriptive statistics and multiple regression. The study result showed that 77% were male. The average Age of the respondents in the study area was 36 years, while average household size was 9 with 74% married. The mean value of the years of schooling was 11 years. Average income earned by the respondents in the study area was 26.20, with weekly consumption of 61.1%. The result further reveals that household income, Age, occupation and marital status were significant determinants of household expenditure on egg consumption.

CHAPTER THREE

3.0 MATERIALS AND METHODS

3.1 Study Area and Scope

This study was carried out in the Faculty of Agriculture, University of Benin, Benin City, Edo State. Benin City is situated approximately 25 miles North of the Benin river and situated 200 miles by road east of Lagos. The university has a population of about 77,000 students comprising part time, full time and postgraduate students. The University is located geographically between latitude 6º20'1.32" North and longitude 5º36'0.53" East. It has a landmass of 1,178 hectares (11.78 Sq km). The school currently has two campuses and is divided into 15 faculties among which is faculty of Agriculture. This faculty comprises 7 departments and occupies approximately 400 hectares (3.96 Sq km) and was selected as the specific Study area due to its diverse student demographic, strong agricultural orientation which may influence dietary choices and consumption patterns as well as the perceived high interest of its potential respondents in nutrition. The faculty of Agriculture is among the 13 faculties in Ugbowo Campus of the University of Benin and was established in 1983. It has a population of 1,700-2,000 undergraduate students. Egg is traditionally consumed as a source of protein with other carbohydrate based commodities such as bread, yam, potatoes, plantain, and boiled to be consumed with rice with stew and moi-

moi. Consumption pattern for Edo state in 2019 showed that the state accounted for 44.08% (over ₦596billion) of the non-food expenditure and 55.92% (over ₦756billion) of the food expenditure in the total expenditure of Nigeria, with poultry and poultry products accounting for 2.0% (over ₦26billion) of food Expenditure in Edo state. National Bureau of Statistics, (2019). The target population for the study is undergraduate beef consumers who are in the study area.

3.2 Sampling Technique

A stratified random sampling technique was employed to ensure representation across the 6 departments which were Agricultural Economics and Extension services, (AEE) Animal science, (ANS) Crop science, (CRS) Soil science and land management, (SLM) Aquaculture and fisheries management (AFM) and Forestry and wildlife management (FWM) in the faculty among 400 level students.

The decision to select penultimate-year students in the Faculty of Agriculture for this study was taken for 2 main reasons:

1. Knowledge and Awareness: By their penultimate year, agriculture students have gained substantial knowledge about food science, nutrition, and agricultural products, including eggs. Their responses are likely to be more informed and reliable compared to those in earlier years.

2. Dietary Independence: Unlike first-year students, who may still be adjusting to university life and meal plans, penultimate-year students are more likely to have established eating habits, making them ideal for assessing true egg consumption patterns.

The Total population of 400 level Agriculture students was discovered to be 219, comprising 51 AEE, 74 ANS, 26 AFM, 30 CRS, 17, FWM and 21 SLM.

Table 3.1 Sampling Frame

Department	**Population**	**Sample size**
AEE	51	24
ANS	74	13
AFM	26	20
CRS	30	26
FWM	17	10
SLM	21	7
		Total = 100

Source: Field survey, 2024

Stratification was based on department and participants were randomly selected within each stratum to form a sample size of 100 students, this size was selected due to the total number of population of 400lv students and is deemed adequate for achieving reliable results while considering time and resource constraints.

3.3 Data Collection

Both primary and secondary data was used for this study. Primary data were sourced using a structured questionnaire which contained information on socio-economic characteristics, Expenditure on non food items and Expenditure on food items. Secondary data were collected through electronic and print media such as journals, periodicals, text books and other relevant materials related to the subject.

3.4 Measurement of Variables

1. The preference of the respondent was measured based on the respondents' consistency in decision making.
2. The demographic characteristics of the respondent was measured based on the respondents' Department, age, gender, marital status, residence (on-campus/off-campus).
3. The expenditure of the respondent was measured in terms of the expenses incurred in purchasing specific quantities of commodities per month

3.5 Analytical Techniques

Data collected was analyzed using descriptive and inferential statistics as they affect the various objectives.

Objective one was analyzed using descriptive statistical tools such as frequency counts, mean, percentage and standard deviation.

Objective two was analyzed using descriptive statistics such as budget share. The budget share is the fraction of the expenditure spent on each individual commodity given as;

$Wi = \frac{PiQi}{m}$

Where;

Pi= unit price of the i^{th} commodity

Qi= quantity bought of the i^{th} commodity

m= Total expenditure

Wi = Budget share of the i^{th} commodity

Objective three and Objective four were analyzed using multiple regression. Multiple regression was used to determine the elasticities, and effect of other factors on fish consumption among undergraduates' students. The model is implicitly presented as;

Objective three

$E=f(P_1, P_2, P_3, P_4, P_5, \varepsilon)$……(3.1)

Objective four

$E=f(X_1, X_2, X_3, P_1, P_2, P_3, P_4, P_5, \varepsilon)$……(3.2)

E = Expenditure on Eggs

X_1= Age of respondent

X_2 = Sex of respondent

X_3 = Price of egg

P_1 = Price of fish

P_2 = Price of beef

P_3 = Price of chicken

P_4 = Price of milk

P_5= Price of pork

ε = Error term

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Results of field study

The results of the data collection procedure presented in table 4.1 shows a target population of 51, 26, 74, 30, 17 and 21 intended for each of the six departments from which 24 respondents were sampled from Agricultural Economics and Extension services(AEE), 26 from Animal science (ANS), 13 from Aquaculture and fisheries management (AFM), 20 from Crop science(CRS), 7 from Forestry and wildlife management (FWM) and 10 from Soil science (SLM). A total of 219 questionnaires were administered and only 100 were returned.

Table 4.1 Results of Field Study

Department	Target population	Sample size	Response (%)
AEE	51	24	47
AFM	26	13	50
ANS	74	26	35
CRS	30	20	67
FWM	17	10	59
SLM	21	7	33
	219	**100**	

Source: Results of Field Study

4.2 Socioeconomic Characteristics of Egg consumers in the of Agriculture, University of Benin, Benin city.

4.2.1. Gender of Egg Consumers

The socio-economic characteristics of undergraduate consumers of egg at the University of Benin, Benin City, Nigeria are presented in Table 4.2 The results showed that 56% of the consumers in 400 level were female, while 44% were male. This suggests a relatively balanced gender distribution, with a slight female dominance in egg consumption. The dominance of female was particularly pronounced among students in AFM (92.31%), and SLM (70.00%), while males were more represented in FWM (71.43%). The slightly higher proportion of female consumers (56%) may suggest that women are more health-conscious or have a stronger preference for eggs compared to their male counterparts. This distribution aligns with previous studies indicating that females tend to have higher preferences for healthier diets, including eggs, due to their nutritional awareness (Miassi *et al*., 2022).

4.2.2. Age of Egg Consumers

The majority of consumers (79%) fell within the 21–25 years age group, while 12% were between 16–20 years, and only 9% were in the 26–30 years category. The mean age across Departments was approximately 23 years, with a standard deviation of 1.79. The dominance of students aged 21–25 years suggests that most consumers are at a stage where they make independent food choices, particularly

those living off-campus (76%). This indicates also that majority of undergraduates in 400L (Penultimate year) are relatively young individuals.

4.2.3. Residence of Egg Consumers

The results also show that 76% of the consumers resided off-campus, while 24% lived within the University campus. This implies that a large number of students do not have access to on-campus accommodation, which has broader implications for their daily routines, lifestyle, and overall well-being. The high percentage of off-campus students highlights the limited availability of University-provided housing. which forces many students to seek accommodation in surrounding neighborhoods. It could also be due to the relative independence associated with off campus living conditions given the freedom from the rules governing on campus living. Off-campus residence provides students with greater autonomy in decision-making, particularly regarding food selection, budgeting, and meal preparation. Unlike students living on campus, who may have restricted food options due to dependence on campus vendors, off-campus students are more exposed to a variety of food outlets, including local markets, restaurants, and street vendors. This increased exposure influences their dietary choices, spending habits, and overall consumption behavior (Duralia, 2023).

Table 4.2 Socio-Economic Characteristics of Egg Consumers

	AEE			AFM			CRS			ANS			SLM			FWM			Pooled		
	Frq.	%	Mean	Frq.	%	Mean	Frq.	%	Mean	Frq.	%	Mean	Frq.	%	Mean	Frq	%	mean	Frq.	%	Mean
Sex																					
Female	10	41.67		12	92.31		13	65.00		12	46.15		7	70.00		2	28.57		56	56.00	
Male	14	58.33		1	7.69		7	35.00		14	53.85		3	30.00		5	71.43		44	44.00	
Age (years)																					
16-20	-	-	-	-	-		5	25.00		6	23.08		1	10.00		-	-		12	12.00	
21-25	22	91.67	23	11	84.62	23	13	65.00	23	18	69.23	22	8	80.00	22	7	100.00	23	79	79.00	23
26-30	2	8.33		2	15.38		2	10.00		2	7.69		1	10.00					9	9.00	
Place of Residence																					
Off-campus	17	70.83		10	76.92		16	80.00		20	76.92		8	80.00		5	71.43		76	76.00	
Campus	7	29.17		3	23.08		4	20.00		6	23.08		2	20.00		2	28.57		24	24.00	

Source: Field survey, 2024

4.3 Expenditure share on Protein sources among University Undergraduates

The expenditure share of protein source is presented in Table 4.3 The pooled mean budget share for egg was 0.38 with a standard deviation of 0.21 while the shares of the other protein sources were 0.10 for milk (0.10), beef (0.15), chicken (0.10), and pork (0.02) and fish (0.25). This suggests that eggs are a greater part of the student expenditure exceeding the budget of the other protein sources. The relatively high budget share of egg (0.38) may also be attributed to its availability in local markets and affordability (Walker and Baum, 2022).

Egg share expenditure varied across the different Departments. Students in Crop Science (CRS) recorded the highest mean budget share (0.43), followed by Forest Resources and Wildlife Management (FWM) (0.44) and Animal Science (ANS) (0.39). The lowest mean egg consumption was observed among Soil and Land Management (SLM) students (0.31). The variation in egg expenditure may be linked to differences in nutritional awareness, disposable income, and personal dietary preferences. Studies suggest that students in agriculture-related disciplines may have greater exposure to nutritional knowledge, which can influence their dietary choices (Eboh and Boye, 2006). Although eggs had the highest expenditure share among the protein sources studied, fish remained the most preferred alternative (0.25). However, the fact that eggs slightly outperformed fish in overall Budget share suggests that students find eggs even more cost-effective and accessible, particularly for quick and convenient meals. Milk expenditure

share among students was notably low (0.10), suggesting that dairy products do not form a significant part of their diet. This could be attributed to several factors, including lactose intolerance, high costs of dairy products, or limited availability of fresh milk (Li *et al*., 2023). In comparison, eggs provide a lactose-free and relatively inexpensive source of protein, making them a more attractive option for students with dietary restrictions such as lactose intolerance. Beef (0.15) and chicken (0.10) were consumed in moderate amounts, but their expenditure share were significantly lower than that of eggs. This is likely due to the higher market prices of beef and chicken, making them less accessible to students with limited financial resources (Subashree, 2022). Eggs, in contrast, provide a cost-effective and nutrient-dense alternative, making them a staple protein source among students. Pork had the lowest recorded budget share (0.02), which can be linked to cultural and religious dietary restrictions prevalent in Nigeria (Nwachukwu and Udegbunam, 2020). Many students may avoid pork due to religious beliefs, particularly among Muslim and Christian communities that discourage or prohibit its consumption. The negligible intake of pork further emphasizes the dominance of eggs and fish as the primary protein sources among the student population.

Table 4.3 Budget share on animal protein for 400 level students

	AEE		AFM		CRS		ANS		SLM		FWM		Pooled	
Variable	Mean	S.D	Mean	S.D	Mean	S.D	Mean	S.D	Mean	S.D	Mean	S.D	Mean	S.D
Fish	0.24	0.15	0.19	0.17	0.26	0.19	0.30	0.16	0.19	0.09	0.21	0.12	0.25	0.16
Milk	0.10	0.13	0.13	0.14	0.08	0.17	0.10	0.15	0.15	0.14	0.06	0.14	0.10	0.15
egg	0.38	0.22	0.32	0.28	0.43	0.24	0.39	0.19	0.31	0.09	0.44	0.21	0.38	0.21
Beef	0.14	0.16	0.15	0.16	0.12	0.15	0.14	0.15	0.27	0.14	0.18	0.15	0.15	0.15
Chicken	0.13	0.15	0.19	0.17	0.10	0.18	0.05	0.09	0.08	0.11	0.06	0.10	0.10	0.15
Pork	0.01	0.03	0.03	0.05	0.01	0.03	0.02	0.05	0.00	0.00	0.04	0.07	0.02	0.04

Source: Field survey, 2024

4.4 Nature of Protein Sources

4.4.1 Nature of Egg

The regression results are presented in table 4.4 F-statistic (4.81, $p < 0.001$) indicates that the overall model is statistically significant, suggesting that the independent variables jointly explain variations in egg expenditure. However, the R-squared value of 0.269 suggests that only 26.9% of the variation in egg expenditure is explained by the independent variables, implying that other factors not included in the model may also influence students' egg consumption behavior. The adjusted R-squared (0.216), which accounts for the number of predictors, suggests a relatively low explanatory power.

The coefficient for beef (-0.506, $p = 0.001$) is negative and statistically significant at the 1% level. This indicates that as beef prices increase, students tend to spend less on eggs, suggesting that beef and eggs are complements. This contrasts with previous studies indicating that in low-income populations, consumers often switch to more affordable protein sources when meat prices rise (Obayelu, Adeyeye, Adepoju and Ayanboye, 2022). The coefficient for total expenditure on protein sources (0.172, $p < 0.001$) is positive and highly significant, indicating that as students allocate more of their budget to protein consumption, their expenditure on eggs also increases. This suggests that eggs are an essential component of students' protein intake and that rising disposable income leads to higher egg consumption (FAO, 2020). The coefficient for Price of egg (-0.44, $p = 0.407$) is negative but not statistically significant. This suggests that changes in

egg prices do not significantly impact students' egg expenditure, implying that egg consumption may be relatively inelastic, meaning students continue purchasing eggs despite price fluctuations. This could be due to the affordability and accessibility of eggs compared to other protein sources (Obayelu *et al*., 2022). The coefficients for Price of milk (0.139, p = 0.263), Price of fish (-0.106, p = 0.755), Price of-chicken (0.048, p = 0.944) and Price of pork (-0.015, p = 0.879) are all statistically insignificant. This suggests that changes in the prices of these protein sources do not significantly influence egg expenditure. The lack of significance implies that these protein sources are not strong substitutes for eggs among students, possibly due to differences in affordability, availability, and consumption preferences (Obayelu *et al*., 2022).

The significant negative relationship between beef and egg suggests that students reduce egg consumption when beef prices increase. One possible explanation is that an increase in beef prices may coincide with a broader rise in food costs, thereby reducing consumers' overall purchasing power, including their ability to buy eggs. Another possibility is that individuals who consume beef may also have a preference for eggs, so when beef becomes more expensive, they reduce their consumption of both products. The positive and highly significant relationship between total protein expenditure and egg expenditure indicates that students allocate a larger proportion of their income to eggs as their overall spending on

protein increases. This suggests that improving students' economic well-being or reducing the cost of other protein sources may lead to greater egg consumption.

The insignificance of the Price of egg coefficient suggests that students do not significantly reduce egg consumption even when prices increase implying that egg is Price Inelastic. This could be due to the nutritional benefits, affordability, and versatility of eggs, making them a staple in student diets. This is consistent with previous findings that egg demand remains relatively stable despite price changes (Obayelu *et al*., 2022).

Table 4.4 Nature of Egg consumed

	Egg				fish				Beef				Chicken				Pork				Milk			
	Coeff	S.e	t-value	P>|t|	Coeff	S.e	t-value	P>|t|	Coeff	S.e	t-value	P>|t|	Coeff	S.e	t-value	P>|t|	Coeffi	S.e	t-value	P>|t|	Coeff	S.e	t-value	P>|t|
Price of milk	0.139	0.124	1.130	0.263	-0.133	0.107	-1.240	0.218	-0.030	0.116	-0.260	0.796	-0.159	0.129	-1.230	0.221	-0.002	0.036	-0.070	0.946	0.185	0.083	2.250	0.027
Price of fish	-0.104	0.331	-0.310	0.755	0.816	0.286	2.850	0.005***	0.035	0.309	0.110	0.911	-0.402	0.345	-1.160	0.248	-0.233	0.095	-2.450	0.016**	-0.112	0.220	-0.510	0.612
Price of egg	-0.444	0.533	-0.830	0.407	-0.783	0.462	-1.700	0.093*	0.754	0.499	1.510	0.134	0.245	0.557	0.440	0.661	-0.055	0.154	-0.360	0.719	0.283	0.355	0.800	0.428
Price of beef	-0.506	0.150	-3.370	0.001***	-0.122	0.130	-0.940	0.349	0.520	0.141	3.690	0.000***	0.081	0.157	0.520	0.607	-0.054	0.043	-1.250	0.214	0.081	0.100	0.810	0.420
Price of chicken	0.048	0.686	0.070	0.944	0.587	0.594	0.990	0.326	0.571	0.643	0.890	0.377	-0.638	0.716	-0.890	0.375	-0.212	0.199	-1.070	0.286	-0.355	0.457	-0.780	0.439
Price of pork	-0.015	0.101	-0.150	0.879	-0.009	0.087	-0.100	0.918	0.076	0.094	0.800	0.423	-0.095	0.105	-0.900	0.369	0.076	0.029	2.620	0.010**	-0.033	0.067	-0.480	0.629
Total expenditure on protein	0.172	0.0329	5.220	0.000***	0.179	0.029	6.320	0.000***	0.233	0.031	7.570	0.000***	0.334	0.034	9.730	0.000***	0.023	0.009	2.390	0.019*	0.059	0.022	2.680	0.009***
Constant	6291.997	4307.500	1.460	0.148	386.302	3730.591	0.100	0.918	-10936.500	4036.031	-2.710	0.008***	2794.512	4500.102	0.620	0.536	2174.413	1242.223	1.750	0.083*	-710.711	2872.159	-0.250	0.805
F(7, 91)	4.810				11.120				19.510				19.020				2.45				2.76			
Prob > F	0.0001				0.000				0.000				0.000				0.024				0.012			
R-squared	0.269				0.461				0.600				0.594				0.158				0.175			
Adj R-squared	0.214				0.419				0.5694/				0.563				0.094				0.112			

Source: Field survey, 2024

4.4.2 Nature of Fish

As shown in Table 4.4 The F-statistic (11.12, $p < 0.001$) indicates that the overall model is statistically significant, suggesting that the independent variables jointly explain a significant proportion of variations in fish expenditure. The R-squared value of 0.461 implies that approximately 46.1% of the variation in fish expenditure is explained by the independent variables. The adjusted R-squared (0.419) further confirms that the model has a moderate explanatory power after adjusting for the number of predictors.

The coefficient for fish (0.816, $p = 0.005$) is positive and statistically significant at the 1% level. This suggests that an increase in fish price leads to a higher expenditure on fish, implying that fish is an inelastic good among the consumers. This behavior could be attributed to a strong preference for fish over other protein sources (Ogunniyi *et al*., 2020). The coefficient for egg (-0.783, $p = 0.093$) is negative but not statistically significant at the 5% level. However, its marginal significance at the 10% level suggests that a higher price of eggs is associated with reduced expenditure on fish. This finding implies that eggs and fish may serve as substitutes, meaning that when egg prices increase, students may shift their protein consumption toward fish (Adetunji & Rauf, 2018). The coefficients for milk (-0.133, $p = 0.218$), beef (-0.122, $p = 0.349$), chicken (0.587, $p = 0.326$), and pork (-0.009, $p = 0.918$) are not statistically significant. This suggests that changes in the prices of these protein sources do not significantly affect fish

expenditure. The lack of significance may indicate that these proteins are not strong substitutes or complements for fish within the dietary choices of the students (Aragão *et al*., 2022).

The coefficient for total protein expenditure (0.179, $p < 0.001$) is positive and highly significant at the 1% level. This suggests that as students allocate more money to protein consumption, their expenditure on fish also increases. This aligns with Engel's Law, which states that as income increases, spending on food (including protein sources) rises (FAO, 2020).

4.4.3 Nature of Beef

As shown in Table 4.4 The model's F-statistic (19.51, $p < 0.001$) indicates that the independent variables collectively explain a significant portion of the variation in beef expenditure. The R-squared value (0.600) suggests that 60.0% of the variation in beef expenditure is explained by the independent variables, showing a moderate to strong model fit. The adjusted R-squared (0.569), which accounts for the number of predictors, remains relatively high, confirming the model's explanatory power.

The coefficient for price beef (0.519, $p < 0.001$) is positive and highly significant. This suggests that as beef prices increase, students tend to spend more on beef, implying that beef consumption remains relatively inelastic. This inelasticity may be due to consumer preference for beef, making it a primary protein source

regardless of price changes. This finding aligns with economic demand theory, where essential commodities tend to have inelastic demand (Obayelu *et al*., 2022). The coefficient for Total expenditure on protein sources (0.233, $p < 0.001$) is positive and highly significant, suggesting that as students allocate more money to protein consumption, their beef expenditure increases. This highlights that beef remains a preferred protein source when income levels rise, aligning with Engel's Law, which states that as income increases, expenditure on preferred food items also rises (FAO, 2020).

The coefficient for price egg (0.754, $p = 0.134$) is positive but statistically insignificant. This suggests that while higher egg prices may encourage students to shift their spending toward beef, the effect is not strong enough to be statistically confirmed. This weak substitution effect implies that eggs and beef may serve distinct roles in students' diets, possibly due to differences in affordability and consumption patterns (Obayelu *et al*., 2022). The positive and significant coefficient for Price of beef suggests that students continue to purchase beef despite price increases. This may be due to taste preference, cultural factors, or a lack of viable substitutes.

The constant term (-10936.500) is negative but statistically significant ($p = 0.0080$), implying that when all explanatory variables are held constant, beef expenditure exhibits a substantial baseline effect

4.4.4 Nature of Chicken

Results in Table 4.4 show that the F-statistic (19.02, $p < 0.001$) indicates that the independent variables significantly explain variations in chicken expenditure. The R-squared value (0.594) suggests that 59.4% of the variation in chicken expenditure is explained by the independent variables. The adjusted R-squared (0.563), which accounts for the number of predictors, remains relatively high, confirming the model's explanatory power.

The coefficient for Total expenditure on protein sources (0.334, $p < 0.001$) is positive and highly significant, suggesting that as students allocate more money to protein consumption, their chicken expenditure increases. This implies that chicken is a preferred protein source when students have more money for food, consistent with Engel's Law, which suggests that as income increases, expenditure on preferred food items also rises (FAO, 2020). This result aligns with previous studies indicating that higher income or budg*et al*location leads to increased demand for poultry products due to their affordability and perceived health benefits (Obayelu *et al*., 2022).

The coefficient for Price of chicken (-0.638, $p = 0.375$) is negative but statistically insignificant. This suggests that while higher chicken prices might discourage consumption, the effect is not strong enough to be statistically confirmed. The lack of significance implies that students may continue purchasing chicken even when prices rise, possibly due to preference, availability, or cultural factors ((Obayelu *et al*., 2022).

The coefficients for Price of milk (-0.159, p = 0.221) and Price of fish (-0.402, p = 0.248) are negative but statistically insignificant. This suggests that increases in milk or fish prices do not significantly influence chicken expenditure, implying that students may not be substituting chicken with milk or fish. This finding contrasts with research suggesting that poultry and fish are often considered substitutes due to similar price ranges and nutritional benefits (Aragão *et al*., 2022). However, the insignificant results here may indicate dietary preferences unique to university students in the study area.

The coefficient for Price of egg (0.245, p = 0.661) is positive but insignificant, suggesting that egg price changes do not strongly influence chicken expenditure. Similarly, Price of beef (0.081, p = 0.607) is positive but insignificant, indicating that students do not switch between beef and chicken based on price changes. These results suggest a weak substitution effect, meaning students may consume eggs and beef independently of chicken consumption, possibly due to differences in price, taste preference, or dietary habits (Aragão *et al*., 2022). The coefficient for Price of pork (-0.095, p = 0.369) is negative but statistically insignificant. This suggests that changes in pork prices do not significantly affect chicken expenditure, likely because pork is not a major protein source among students in this region. This finding aligns with previous studies indicating that pork consumption in Nigeria is relatively low due to religious and cultural factors (Obayelu *et al*., 2022).

4.4.5 Nature of Pork

The regression results in Table 4.4 show that the model is statistically significant (F = 2.45, p = 0.024), suggesting that the independent variables collectively explain variations in pork expenditure. However, the R-squared value (0.1584) indicates that only 15.84% of the variation in pork expenditure is explained by the model, which suggests that other unobserved factors influence pork consumption among students. The adjusted R-squared (0.094) is relatively low, reinforcing that while the model is statistically significant, it does not explain a large proportion of the variation in pork expenditure.

The coefficient for Price of pork (0.076, p = 0.01) is positive and statistically significant, indicating that higher pork prices lead to increased pork expenditure. This is an unusual result because price increases typically lead to reduced consumption (law of demand). However, the significance of this coefficient may suggest that students who consume pork may have a strong preference for it, making their demand relatively inelastic (Aragão *et al*., 2022). This could also be indicative of a premium effect, where consumers perceive higher-priced pork as higher quality and are willing to pay more (Ngo *et al*., 2023).

The coefficient for Total expenditure on protein (0.026, p = 0.019) is positive and statistically significant, implying that as students allocate more funds to protein consumption, their pork expenditure increases. This finding aligns with Engel's

Law, which states that as income (or budget) increases, expenditure on preferred food items also rises (FAO, 2021).

This suggests that pork is a normal good, meaning that students are likely to consume more of it as their disposable income for food increases (Ngo *et al*., 2023). The coefficient for Price of fish (-0.233, p = 0.016) is negative and statistically significant, suggesting that an increase in fish prices leads to increased pork expenditure. This indicates that fish and pork are substitutes, meaning that when fish becomes more expensive, students opt for pork as an alternative protein source (Eze *et al*., 2020). This substitution effect may be due to affordability, taste preferences, or dietary flexibility among students.

The coefficients for Price of milk (-0.002, p = 0.946), Price of egg (-0.055, p = 0.719), Price of beef (-0.054, p = 0.214), and Price of chicken (-0.212, p = 0.286) are all statistically insignificant. This suggests that changes in the prices of milk, eggs, beef, and chicken do not significantly influence pork expenditure. The lack of significance for Price of chicken and Price of beef indicates that pork is not strongly substituted for these meats, possibly due to dietary habits, religious restrictions, or cultural preferences (Shaltout, 2024).

The significant positive coefficient for Price of pork suggests that students who consume pork continue purchasing it even when prices rise, implying inelastic demand. This contrasts with other protein sources such as fish, where price

increases lead to reduced demand. This may indicate a niche market for pork consumption among students who are less sensitive to price changes.

Fish and Pork Exhibit a Strong Substitution Effect. The negative and significant coefficient for Price of fish suggests that when fish prices increase, students switch to pork as an alternative. This substitution effect suggests that policies or interventions aimed at stabilizing fish prices could influence pork consumption trends among students. The significant effect of Total expenditure on protein sources indicates that students with higher disposable income for protein tend to allocate more funds to pork consumption. This implies that economic conditions and financial support programs for students can impact their dietary choices.

4.4.6 Nature of Milk

As shown in Table 4.4 The regression model is statistically significant ($F(7,91) = 2.76$, $p = 0.012$), indicating that the independent variables collectively explain variations in milk expenditure. However, the R-squared value (0.175) suggests that only 17.5% of the variation in milk expenditure is explained by the model, implying that other factors not captured in the model influence milk consumption among students. The adjusted R-squared (0.112) further confirms this low explanatory power. The coefficient for Price of milk (0.186, $p = 0.027$) is positive and statistically significant, indicating that higher milk prices are associated with increased milk expenditure. This result is counterintuitive, as economic theory suggests that higher prices should lead to reduced consumption (law of demand).

However, this finding may imply that milk consumers in the study area have a strong preference for milk and continue to purchase it despite price increases (Bahety *et al*., 2022). Another possible explanation is that higher prices may reflect improved milk quality, leading to increased consumer spending (Mistura *et al*., 2021). The coefficient for Total expenditure on protein source (0.059, p = 0.009) is positive and statistically significant, suggesting that as students allocate more funds to protein consumption, their milk expenditure increases. This aligns with Engel's Law, which states that as income (or budg*et al*location) increases, expenditure on preferred food items also rises (FAO, 2020). This suggests that milk is a normal good, meaning that students tend to consume more of it when they have higher disposable income for food.

The coefficients for Price of fish (-0.112, p = 0.612), Price of egg (0.283, p = 0.428), Price of beef (0.081, p = 0.420), Price of chicken (-0.355, p = 0.439), and Price of pork (-0.036, p = 0.629) are all statistically insignificant, suggesting that changes in the prices of these protein sources do not significantly influence milk expenditure. The insignificance of alternative protein sources implies that students may not view milk as a direct substitute for meat or eggs. Instead, milk consumption might be influenced by habitual dietary choices or health concerns rather than price fluctuations of other proteins (Olukosi *et al*., 2020)..

The significant positive coefficient for Price of milk suggests that students who consume milk continue purchasing it even when prices rise, implying inelastic

demand. This could indicate that milk is considered essential among students, possibly due to its nutritional benefits (Ogunniyi *et al*., 2021). The insignificance of other protein prices further supports the idea that milk is not easily substituted with meat or eggs in the students' diet. The significant effect of Total expenditure on protein suggests that students with higher disposable income for protein tend to allocate more funds to milk consumption. This highlights the role of financial constraints in determining students' dietary choices and suggests that income support programs may improve milk consumption among low-income students.

4.5 Factors Affecting Egg Consumption

4.5.1 Determinants of egg consumption

The regression analysis presented in Table 4.5 examines the determinants of egg consumption among undergraduate students at the University of Benin, Benin City, Nigeria. As shown in Table 9, ($F(10, 88) = 3.98$, $Prob > F = 0.002$), indicates that the independent variables collectively influence egg consumption patterns. The model reports an R-squared value of 0.311, indicating that approximately 31.1% of the variation in egg consumption is explained by the independent variables included in the model. The adjusted R-squared value of 0.233 suggests a good fit after accounting for the number of predictors. The overall model is statistically significant

The price of beef has a significant, negative effect on egg consumption (Coefficient = -0.453, p = 0.003), implying that an increase in beef prices leads to decrease in egg consumption, contrasting with studies by Parkhi (2023). This may mean that beef and egg are complementary goods and an increase in the price of one leads to the a reduction in the consumption of the other. The price of egg (Coefficient = -0.368, p = 0.499), fish (Coefficient = -0.220, p = 0.508), milk (Coefficient = 0.164, p = -0.0633), pork (Coefficient = -0.063 p = 0.842), and chicken (Coefficient = -0.219, p = 0.754) were not statistically significant predictors of egg consumption. This suggests that changes in the prices of these protein sources do not significantly influence students' egg consumption behavior. Similar findings were reported by Kozelová *et al*. (2018), who noted that students consider factors such as convenience, taste preferences, and health concerns rather than just price when selecting protein sources.

Total expenditure on animal protein was found to be highly significant and positively correlated with egg consumption (Coefficient = 0.179, p = 0.000). This implies that students who spend more on animal protein are more likely to consume eggs. This aligns with findings by Eze *et al*. (2019), which showed that individuals with higher disposable income tend to diversify their protein sources, including eggs.

Age was not a significant determinant of egg consumption (Coefficient = -207.079, p = 0.247). This suggests that students' age does not substantially influence their likelihood of consuming eggs, contradicting previous research by Blum *et al*. (2023), which found that younger individuals tend to consume more eggs due to their preference for fast and easy-to-prepare meals. A significant positive coefficient of Sex (Coefficient = 1436.885, p = 0.029), indicates that male students tend to spends more on eggs than female students a pattern similar to findings by Ikujenlola and Adekoya (2020). The location of residence within the University (Campus) did not significantly impact egg consumption (Coefficient = 113.5324, p = 0.869). This suggests that whether students live on or off-campus does not significantly influence their egg consumption behaviour and it may be due to the nature of egg as a necessity. A similar study by Omage, and Omuemu (2019) in a different Nigerian University found that students' egg consumption was more influenced by financial constraints and dietary preferences than their residential location.

Table 4.5 Factors Affecting Egg Consumption

	Egg				Fish				Beef				Chicken				Pork				Milk			
	Coefficient	S.D	T	P>|t|	Coefficient	S.D	T	P>|t|	Coefficient	S.D	T	P>|t|	Coefficient	S.D	T	P>|t|	Coefficient	S.D	T	P>|t|	Coefficient	S.D	T	P>|t|
Price of milk	0.164	0.123	1.33	0.187	-0.127	0.110	-1.160	0.250	-0.035	0.113	-0.310	0.758	-0.182	0.127	-1.430	0.155	-0.001	0.036	-0.030	0.979	0.180	0.082	2.210	0.030**
Price of fish	-0.220	0.332	-0.66	0.508	0.803	0.294	2.730	0.008***	0.034	0.305	0.110	0.911	-0.306	0.341	-0.900	0.372	-0.246	0.097	-2.53	0.013**	-0.065	0.219	-0.300	0.7670
Price of egg	-0.368	0.543	-0.68	0.499	-0.896	0.482	-1.860	0.066*	0.623	0.499	1.250	0.215	0.448	0.558	0.800	0.424	-0.049	0.159	-0.31	0.758	0.242	0.359	0.670	0.503
Price of beef	-0.453	0.150	-3.01	0.003**	-0.123	0.133	-0.920	0.358	0.551	0.138	3.990	0.000***	0.026	0.154	0.170	0.000	-0.044	0.044	-0.99	0.323	0.043	0.099	0.430	0.666
Price of chicken	-0.218	0.695	-0.31	0.754	0.612	0.616	0.990	0.324	0.271	0.638	0.420	0.672	-0.289	0.713	-0.400	0.686	-0.287	0.203	-1.41	0.161	-0.089	0.459	-0.190	0.847
price of pork	-0.063	0.103	-0.62	0.540	-0.018	0.091	-0.200	0.842	0.033	0.095	0.350	0.728	-0.020	0.106	-0.190	0.849	0.066	0.030	2.190	0.031**	0.003	0.068	0.040	0.965
Total expenses on protein	0.179	0.034	5.32	0.000*	0.177	0.030	5.930	0.000***	0.212	0.031	6.860	0.000***	0.348	0.035	10.080	0.000*	0.021	0.010	2.150	0.034**	0.063	0.022	2.830	0.006***
Age	-207.079	177.629	-1.17	0.247	124.948	157.582	0.790	0.430	270.977	163.245	1.660	0.100	-231.570	182.436	-1.270	0.208	-5.364	51.937	-0.1	0.918	48.088	117.464	0.410	0.683
Sex	1436.885	645.868	2.22	0.029**	-23.907	572.975	-0.040	0.967	690.527	593.566	1.160	0.248	-1394.470	663.347	-2.100	0.038**	266.017	188.847	1.410	0.162	-975.051	427.106	-2.280	0.025**
Residence type	113.532	684.098	0.17	0.869	382.455	606.891	0.630	0.530	-871.926	628.701	-1.390	0.169	-15.051	702.613	-0.020	0.983	-150.149	200.026	-0.75	0.455	541.138	452.388	1.200	0.235
Constant	11536.97	5479.590	2.11	0.038**	-1990.270	4861.163	-0.410	0.683	-14341.400	5035.860	-2.850	0.005***	5118.212	5627.890	0.910	0.366	2662.684	1602.194	1.660	0.100	-2986.162	3623.602	-0.820	0.412
F (10, 88)	3.98				7.7				15.45				14.97				1.98				2.7			
Prob > F	0.000				0.000				0.000				0.000				0.045				0.0062			
R – squared	0.311				0.467				0.637				0.629				0.184				0.2346			
Adj R – Squared	0.233				0.406				0.596				0.588				0.091				0.148			

Source: Field Survey, 2024

4.5.2 Determinants of fish consumption

Table 4.5 presents another regression model explaining factors influencing consumption of fish. The model is significant (F(10, 88) = 7.7, Prob > F = 0.0000), with an R-squared value of 0.4666, meaning it explains 46.66% of the variation in expenditure on fish. A significant positive coefficient (Coefficient =0.803, p = 0.008) implies that as the price of fish increases, expenditure on fish also increases, reflecting an inelastic demand for fish among students. Conversely, a negative significant. Price of eggs (Coefficient= -0.896, p = 0.008) implies that as price of fish degrees, expenditure on eggs increases. Total Expenditure on Protein remains significant (Coefficient =0.177, p < 0.000), reinforcing the idea that higher protein expenditure is associated with greater fish consumption. Sex was not significant (Coefficient =-23.9066, p = 0.967) indicating that there is no substantial difference in fish consumption between male and female University students.

The results indicate that price changes in substitute proteins, particularly egg, significantly influence fish consumption patterns among undergraduates. The significant role of total protein expenditure suggests that students with higher disposable income allocate more funds to fish consumption. The findings contribute to existing literature by reinforcing the economic theory of demand and

substitution effects, highlighting that protein consumption is dynamic and influenced by relative price changes (Wu, 2023).

4.5.3 Determinants of Beef consumption

Table 4.5 provides insight into the factors influencing consumption of beef among students. The model is statistically significant ($F(10, 88) = 15.45$, $Prob > F = 0.000$), explaining 63.71% of the variation in beef expenditure (R-squared = 0.6371). A significant positive coefficient (0.551, $p < 0.001$) suggests that as beef prices increase, expenditure on beef also rises, possibly reflecting an inelastic demand for beef among students (Adepoju *et al*., 2021**).** Total Expenditure on Protein coefficient (0.212, $p < 0.001$) confirms that students who spend more on protein tend to allocate more funds to beef, aligning with previous studies (Omotayo 2022). Age (270.98, $p = 0.1$) suggests that older students may spend more on beef, though the relationship is not statistically significant. Male students exhibit higher beef expenditure than female students (690.53, $p = 0.248$), though the result is not significant. The results indicate that price changes in substitute proteins, particularly fish and beef, significantly influence egg consumption patterns among undergraduates. The significant role of total protein expenditure suggests that students with higher disposable income allocate more funds to egg consumption. Additionally, gender differences in egg expenditure imply the need for targeted nutritional interventions, particularly among female students.

4.5.4 Determinants of chicken consumption

Table 4.5 shows the regression results analyzing factors influencing chicken consumption among University students. The model is statistically significant ($F(10, 88) = 14.97$, $Prob > F = 0.000$), demonstrating strong explanatory power. The R-squared value (0.6299) suggests that approximately 62.99% of the variation in chicken expenditure is explained by the independent variables included in the model. The coefficient for Total expenditure on protein (0.348, $p < 0.001$) indicates a strong positive relationship between students' total protein expenditure and their spending on chicken. This suggests that students who allocate more funds to overall protein consumption also tend to spend significantly more on chicken. This finding is consistent with Ojegele *et al*. (2024), who reported that higher protein consumption budgets are associated with greater expenditure on specific protein sources, including poultry.

The coefficient for sex (-1394.47, $p = 0.038$) reveals a statistically significant negative relationship, indicating that male students spend significantly less on chicken compared to female students. This suggests potential gender differences in dietary preferences, which align with the findings of Ojegele *et al*. (2024), who reported that female students tend to prioritize poultry consumption more than

their male counterparts, possibly due to dietary preferences, health consciousness, or cultural norms. price of milk, price of fish, price of eggs, price of beef, price of chicken, price of pork (pork), age, and type of hostel, do not exhibit statistical significance ($p > 0.05$). This implies that within this sample, these factors do not have a meaningful impact on students' chicken expenditure. The model's adjusted R-squared (0.5878) confirms that even after adjusting for the number of predictors, the explanatory power remains strong.

4.5.5 Determinants of Pork consumption

Table 4.5 presents the factors influencing consumption of pork among students. The model is statistically significant ($F(10, 88) = 1.98$, Prob > F = 0.0445), explaining approximately 18.4% of the variation in pork expenditure (R-squared = 0.184). A significant negative coefficient (price of fish (-0.246, $p = 0.013$) suggests that as fish prices increase, pork expenditure decreases. This finding implies that students may view fish and pork as complementary goods rather than substitutes. The coefficient for pork is positive (0.066, $p = 0.031$), indicating that an increase in pork prices is associated with higher expenditure on pork, which may suggest inelastic demand for pork among students. A significant positive coefficient (0.021, $p = 0.034$) suggests that students who spend more on protein sources also allocate funds to pork consumption, consistent with prior findings (Ojegele *et al*., 2024). The results indicate that price changes in substitute proteins,

particularly fish and beef, significantly influence egg consumption patterns among undergraduates. The significant role of total protein expenditure suggests that students with higher disposable income allocate more funds to egg consumption. Additionally, gender differences in egg expenditure imply the need for targeted nutritional interventions, particularly among female students.

4.5.6 Determinants of Milk consumption

The results from Table 4.5 provide insights into the determinants of milk consumption among University undergraduates. The model is statistically significant ($F(10, 88) = 2.7$, $Prob > F = 0.0062$), explaining 23.46% of the variation in milk expenditure (R-squared = 0.2346). A significant positive coefficient (0.180, $p = 0.03$) suggests that higher milk prices are associated with increased expenditure, potentially indicating a preference for milk despite price variations. A positive and significant coefficient-of Total Expenditure on Protein (0.063, $p = 0.006$) implies that students who spend more on protein sources also allocate more funds to milk consumption. A negative and significant coefficient (-975.05, $p = 0.025$) indicates that male students tend to spend less on milk compared to female students. The results indicate that price changes in substitute proteins, particularly fish and beef, significantly influence egg consumption patterns among undergraduates. The significant role of total protein expenditure suggests that students with higher disposable income allocate more funds to egg

consumption. Additionally, gender differences in egg expenditure imply the need for targeted nutritional interventions, particularly among female students.

CHAPTER FIVE

5.0 SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 SUMMARY

This study examined the demand analysis of egg among undergraduate students of the University of Benin, Benin City, Nigeria. The research focused on understanding the socio-economic characteristics of egg consumers, the level of egg consumption relative to other animal protein sources, the nature of eggs consumed, and the determinants of egg consumption.

The results indicated that 56% of consumers were female, while 44% were male, suggesting a slightly higher preference for eggs among female students. The majority of consumers (79%) were between 21-25 years, with a mean age of 23 years About 76% of students resided off-campus, while 24% lived on campus. Off-campus students had greater autonomy in food choices, which could influence their egg consumption patterns.

The pooled mean egg consumption was 0.38 per student, making eggs a primary source of animal protein. Compared to other protein sources, egg consumption was highest, followed by fish (0.25), beef, (0.15), chicken (0.10), milk (0.10) and

pork (0.02). The highest mean egg consumption was recorded among students in Crop Science (0.43), Forestry and Wildlife Management (0.44), and Animal Science (0.39). The lowest was among Soil and Land Management students (0.31).

A significant negative coefficient (-0.453, $p = 0.003$) suggests that an increase in beef prices leads to a decrease egg consumption, indicating that eggs serve as a complement for beef. A highly significant positive coefficient (0.179, $p < 0.000$) indicates that students who spend more on protein sources tend to consume more eggs. A significant positive coefficient (1436.88, $p = 0.029$) suggests that male students spend more on eggs compared to female students. The prices of milk, chicken, fish, and pork were not significant predictors of egg consumption, indicating that these protein sources do not strongly influence students' egg consumption behavior.

5.2 CONCLUSION

Based on the findings of this study, it was concluded that egg consumption was influenced by socio-economic factors such as gender, age, and place of residence, with female students slightly outnumbering male consumers. The majority of students were within the 21–25 age range with a mean age of 23 years and resided off-campus, which provided them greater autonomy over their food choices.

Eggs emerged as a major animal protein source among students. The regression analysis identified key determinants of egg consumption, including the prices of substitute proteins (beef), total protein expenditure, and gender. The study also highlighted that fish, milk, chicken, and pork did not significantly influence egg consumption patterns.

Overall, the study underscores the importance of eggs in students' diets and suggests that affordability and accessibility make eggs a more preferable protein source among undergraduate students.

5.3 RECOMMENDATIONS

Based on the results of the study, the following recommendations were made;

1. The study highlights egg as a primary source of animal protein among students. The University should organize awareness programs to educate students on the nutritional benefits of eggs and other protein sources to promote a balanced diet and potentially increase consumption.
2. Policymakers and stakeholders in the poultry industry should work towards stabilizing egg prices, ensuring affordability for students and other low-income consumers.
3. University food vendors and supermarkets should be encouraged to stock and sell eggs at affordable rates while providing diverse preparation

options, such as scrambled and poached eggs, to cater to different preferences.

4. Egg producers and marketers could target female undergraduate students, as they showed a slightly higher preference for eggs..

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RESEARCH QUESTIONNAIRE

DEPARTMENT OF AGRICULTURAL ECONOMICS AND EXTENSION SERVICES, FACULTY OF AGRICULTURE, UNIVERSITY OF BENIN, BENIN CITY, NIGERIA.

QUESTIONNIARE ON: "EGG CONSUMPTION PATTERN AMONG UNDERGRADUATES OF THE UNIVERSITY OF BENIN, BENIN CITY, NIGERIA"

Dear Respondents,

I am a final year student in the above named department. The purpose of this research is to access **Egg Consumption Pattern Among Undergraduates in the University of Benin.** Kindly answer as correctly to ensure reliable data collection for the study.

The research is clearly for academic purposes and your response will be treated as confidential. Thanks for your anticipated co-operation.

Yours faithfully.

THEODORE OSAKPOLOR OSARENORIABE.

INSTRUCTIONS

Please tick or fill the necessary information as may be appropriate.

SECTION A

SOCIO-ECONOMIC CHARACTERISTICS

(1) Department/level: _____ _____

(2) Age (years): _____

(3) Marital status: (a) Married ☐ (b) Single ☐

(4) Sex: Male ☐ Female ☐

(5) Students' monthly allowance(₦): _____

(6) Place of residence: (a) Off campus ☐ (b) School hostel ☐

(7) Household size: _____

SECTION B

EXPENDITURE OF NON-FOOD ITEMS

COMMODITY	**TOTAL COST**
Education	
Transportation	

Electricity	
Clothing	
Communication	
Housing	
Healthcare	

SECTION C: EXPENDITURE OF FOOD ITEMS

COMMODITY	DAILY		WEEEKLY		MONTHLY	
	QTY	COST	QTY	COST	QTY	COST
CARBOHYDRATE						
Rice						
Garri						
Yam						
Potatoes						
Spagetti						
Fufu (santana)						
Bread						
PROTEIN						
Beans						
Milk						
Fish						
Egg						
Beef						
Chicken						
Chevon						
Mutton						
Cheese						
Pork						
FAT AND OIL						
Groundnutoil						
Palmoil						
Butter						
Groundnut						
VITAMINS(FRUITS AND VEGETABLES)						
Pumpkin (Ugwu)						
Pineapple						
Apple						
Watermelon						
Cucumber						
Cabbage						

Corchorus (Ewedu)						
Okra						
Tomato						
African spinach (efo tete)						
Onion						
Pepper						
Nigerian spinach (efo shoko)						
WATER						
Sachet water						
Bottle water						
MISCELLANEOUS						
Salt						
Maggi						