



RESEARCH ARTICLE

An Evaluation of the Impact of Staple Food Inflation on Household Feeding Patterns: A Case Study of Benin City

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ABSTRACT

Staple food inflation is a major socioeconomic challenge in Nigeria, especially in urban centres where rising prices of essential food items continue to affect the welfare and nutritional stability of households. This study aimed to evaluate the impact of staple food inflation on household feeding patterns in Benin City, Nigeria. A mixed-methods approach was used, and primary data were collected using structured questionnaires administered to 374 respondents, while secondary data on food prices and inflation were sourced from official records. The price trends of major staple foods and shifts in meal frequency and dietary habits were examined. There was a substantial increase in staple food prices between 2023 and 2024, with over 70% hikes in beans and garri. Significant alterations were seen in feeding patterns of households: those consuming three meals daily dropped from 52.4% to 25.7%, while those limited to one meal daily rose from 2.4% to 27%. A statistically significant positive correlation ($r = 0.136$, $p = 0.009$) was observed between food inflation and changes in feeding behaviour. The findings indicate a direct impact of rising food costs on meal reduction, dietary simplification, and increased vulnerability to food insecurity. Policy measures such as price stabilization, investment in smallholder agriculture, expansion of social protection programs, and improved infrastructure for food distribution would curb inflation effects.

Keywords: *Staple; Inflation; Mixed methods; Nigeria*

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1. INTRODUCTION

Staple food inflation is a significant challenge to urban food security, especially in rapidly growing cities like Benin City. According to Maslow's hierarchy of needs (Maslow, 1943), food is the most basic of the three basic human needs. In Nigeria, rising food prices due to inflation, insecurity, climate change, and economic problems make it hard for families to get good meals. Hence, food security now depends not only on availability but also on affordability and access, both of which have been strained in Benin City.

Many factors, including the COVID-19 pandemic, the Russia-Ukraine conflict, currency depreciation, high energy and transportation costs, and insecurity in food-producing regions, have made prices of meals expensive (Alfa & Alexander, 2024). As the prices of common staple foods like rice, beans, yam, and Garri rise, families are forced to change their diet to more affordable ones, which usually have lower nutritional composition.

According to the Central Bank of Nigeria (2023), food inflation peaked at 31.52% in October 2023 and is alarming in a country where nearly 59% of household income is spent on food (Egwuma et al., 2019). The National Bureau of Statistics' June 2017 Food Price Watch data showed that, on an annual basis (May 2016–May 2017), the average price per kilogram of imported rice increased by 29.6%, the average price per kilogram of medium-sized Agri-eggs increased by 34.6%, and the average price per kilogram of tomato increased by 13.0%. This goes to show that the poor and vulnerable households bear the brunt of food price increases, spending as much as 80% (Obayelu, 2010) or more of their income on food. Food budget cuts are frequently the first thing that households do when they experience severe negative price or income shocks (Ayinde et al., 2012; Capuno et al., 2013).

According to available data on malnutrition in Nigeria, the country's under-5 child stunting and wasting rates are roughly 32% and 9%, respectively (NPC/ICF, 2014), and the country's hunger situation is still considered "serious" from an international perspective (Von Grebmer et al., 2015). Based on food calorie intake, some studies have estimated that between 49% and 78% of households in the nation experience food insecurity (Omotesho et al., 2007; Nnakwe & Onyemaobi, 2013; Obayelu, 2012). Additionally, it has been discovered that a significant number of households in the nation eat low-quality and less diverse meals (Ajani, 2010; Sedodo et al., 2014; Agada & Igbokwe, 2015; Akerele, 2013). According to estimates based on self-evaluation (regardless of its subjectivity), the prevalence of poverty in Nigeria is higher, with several studies estimating income poverty to be between 60% and 75% (Dada, 2011; Kale, 2012).

In Benin City, residents struggle with the daily challenges of staple food inflation, which significantly alters their feeding patterns. Despite these challenges, localized data on how inflation specifically impacts urban food consumption and coping strategies remains limited. This is because national statistics often overlook city-specific dynamics, thus making it difficult for policymakers to design effective interventions.

Thus, this study seeks to address this gap by evaluating how rising staple food prices impact purchasing power and feeding patterns in Benin City, considering the varying responses of different socioeconomic groups. This can be achieved through the objectives of examining the previous and current prices of staple foods, investigating the possible causes of the increase in staple food prices, and examining previous and current feeding patterns to determine whether there has been any perceived change.

2. MATERIALS AND METHODS

Study Area

Benin City, the capital of Edo State in Southern Nigeria, lies between latitudes 6°11'N - 6°27'N and longitudes 5°31'E - 5°44'E (Figure 1). With an estimated population of 1.9 million in 2023. The city is geographically positioned in the southern part of Edo State. The city comprises five Local Government Areas. Overall, the city's territorial coverage is roughly 1,318 km², with 166km² and 78 meters above sea level (Ekhaese et al., 2014). The city is located in the humid tropical rainforest belt of Nigeria. The rainy season in Benin begins in March/April and ends in October/November. Rainfalls are of high intensity and usually double maxima, with a short dry spell in August, usually referred to as the August Break.

The indigenous people of Benin City are the Edo people, and they speak the Edo language and other Edoid languages. The people of the city have one of the richest dress cultures on the African continent and are known for their beads, body marks, bangles, anklets, and raffia work. Agriculture is the mainstay of the economy. Yams, cassava (manioc), oil palm produce, rice, and corn (maize) are the major subsistence crops, while rubber, timber, and palm oil and kernels are cash crops. Because of the nodal transportation system, the city serves as an important part of the major collection and distribution centre for commodities. It also serves as a socioeconomic hub with activities ranging from commerce and agriculture to services.

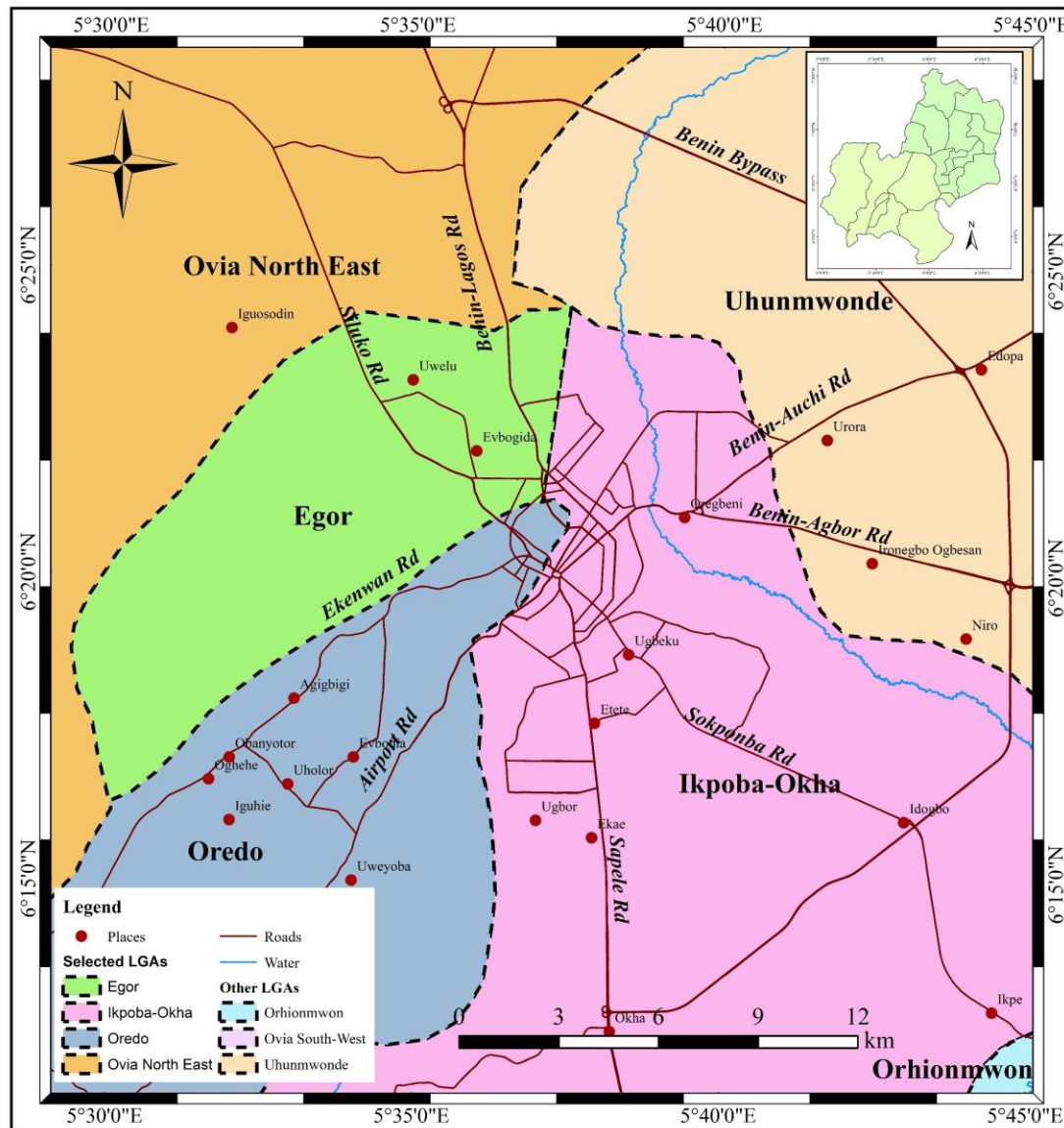


Figure 1. Edo State showing Benin City and the selected Local Government Areas

The study focuses on core staple food items commonly consumed in Benin City. It examines feeding patterns before and after the inflation surge. The study combines both primary data (structured questionnaires) and secondary data (from market surveys and government reports) to analyze pricing trends and behavioral changes over time. The primary data collection

covered learning about respondents' demographic profiles, socioeconomic backgrounds, dietary habits, comprehension, and attitudes toward rising food prices, as well as their concerns about how these costs impact their daily diets. Secondary data on food prices, inflation, and household consumption patterns in Benin City were retrieved from government reports, statistical data, and current literature.

In the distribution of questionnaires, a multistage sampling strategy was employed in the study, while the purposive sampling technique was employed to select people who are knowledgeable about the feeding habits and food expenses in each selected home. The Taro Yamane (1967) formula was used to determine the sample size for this investigation.

$$n = N / (1 + N(e)^2) \text{ ----- Equation 1}$$

Where:

n= the desired sample size.

N= total population size of the study area.

With a confidence level of 95% ($e = 0.05$). This resulted in 399 copies of the questionnaires that were distributed to the study participants.

To assess how staple food costs have changed over time, the following formula was used

$$\% \text{Change} = (\text{New Price} - \text{Old Price}) / (\text{Old Price}) \times 100$$

The Pearson correlation coefficient (r) was used to ascertain the changes in participants' feeding patterns to changes in food prices, with the following equation:

$$r = \frac{N \sum XY - \sum X \sum Y}{\sqrt{N \sum X^2 - (\sum X)^2} \sqrt{N \sum Y^2 - (\sum Y)^2}} \text{ ----- Equation 2}$$

Where:

- X represents staple food prices
- Y represents changes in feeding patterns (such as meal frequency, diet variety, and nutritional intake)
- N is the number of observations

A positive correlation ($r > 0$) would suggest that feeding habits alter dramatically in response to rising food costs, potentially resulting in fewer meals or less dietary variety. An inverse link would be implied by a negative correlation ($r < 0$), but a correlation that is close to zero would indicate little influence.

3. RESULTS AND DISCUSSION

Socio-Demography of the Respondents

The study included 374 respondents, with 55.9% (209 individuals) male and 44.1% (165 individuals) female, giving a balanced perception on gender-specific food management behaviours. The majority of respondents (41.9%) were within the younger age group of 18–25, and they may face higher vulnerability due to poor income or financial dependence. Respondents within the age group of 26–35 made up 26.9% and are individuals trying to balance household expenses and family responsibilities, and are highly sensitive to price hikes. Older respondents 36–45 (16.2%) and 46–66 (15%) may also face fixed income constraints but would be less sensitive to price hikes due to more financial stability. Age influences food needs, financial independence, and coping strategies.

Table 1. Socio-Demography of Respondents

Gender Distribution of Respondents		
Gender	Frequency	Percent
Male	209	55.9
Female	165	44.1
Total	374	100.0
Age Distribution of the respondents		
Age Distribution	Frequency	Percentage
18-25	157	41.9
26-35	101	26.9
36-45	61	16.2
46-55	29	7.8
56-66	26	7.2
Total	374	100
Religion of Respondent		
Religion	Frequency	Percent
Christian	295	78.9
Muslim	60	16.0
Traditionalist	8	2.1
Others	11	2.9
Total	369	98.7
Education level of Respondents		
Education level	Frequency	Percent
No Formal Education	10	2.7
Primary School Education	13	3.5
Secondary School Education	105	28.1
Tertiary Education	246	65.8
Total	374	100.0

Religion also plays a significant role in food habits, fasting, and access to community support. The majority of the respondents were Christians (78.9%), followed by Muslims (16.0%). Religious practices like Ramadan or Christmas can influence food consumption and impact price hikes. Religious organizations may also offer support through charity and food aid to ameliorate price effects. Education, on the other hand, can also influence the feeding habits of individuals. From the research, most of the respondents, accounting for 65.8%, had tertiary education, which suggests high capacity for informed choices related to urban services and food planning. Only a small percentage had no formal education or only primary education. A well-educated population is more likely to demand better infrastructure and adapt more effectively to rising food costs, making education a key factor in food security and urban development strategies.

Occupation and Monthly Income of the Respondents

Table 2 shows how occupation and income of respondents can affect dietary choices. Respondents earning below ₦10,000 are mostly unemployed (58.3%), with a few traders and artisans, indicating that individuals in this bracket are largely without formal employment. Students (51.4%) and civil servants (21.6%) fall within the income range of ₦10,000–₦30,000. This group includes many low-income earners, especially from entry-level government jobs and students with low earnings or

allowances. Respondents within the ₦30,001–₦60,000 bracket consist mainly of traders (30.8%), artisans (24.6%), and students (26.2%). This is the middle-income group with mostly informal or semi-formal economic activities. A similar trend continues in the ₦60,001–₦100,000 range, where traders and artisans remain prominent alongside civil servants and private sector workers, indicating a blend of formal and informal occupation types. The highest income group, above ₦100,000, includes artisans (23.6%), private sector employees (19.7%), and civil servants (16.5%), suggesting that skilled workers and formal employees are more likely to earn higher incomes. Overall, artisans and students constitute the largest proportion of the total respondents, and the data show that informal occupations like trading and artisan work can yield both low and high earnings, depending on scale and skill level.

Table 2. Occupation and Monthly Income of the Respondents

Monthly Income	Civil Servant	Private Sector	Trader	Farmer	Artisans	Unemployed	Students	Total
Below 10,000	0	0	2	0	2	7	1	12
% within Income	0.00%	0.00%	16.70%	0.00%	16.70%	58.30%	8.30%	100.00%
10,000–30,000	8	0	2	2	3	3	19	37
% within Income	21.60%	0.00%	5.40%	5.40%	8.10%	8.10%	51.40%	100.00%
30,001–60,000	5	5	20	1	16	1	17	65
% within Income	7.70%	7.70%	30.80%	1.50%	24.60%	1.50%	26.20%	100.00%
60,001–100,000	7	4	12	1	10	1	4	39
% within Income	17.90%	10.30%	30.80%	2.60%	25.60%	2.60%	10.30%	100.00%
Above 100,000	21	25	17	10	30	7	17	127
% within Income	16.50%	19.70%	13.40%	7.90%	23.60%	5.50%	13.40%	100.00%
Total	41	34	53	14	62	19	58	281
% within Income	14.60%	12.10%	18.90%	5.00%	22.10%	6.80%	20.60%	100.00%

Respondent's occupation determines income levels, which in turn determines purchasing power, dietary choices and food security. As food prices increase, households with lower or inconsistent income may struggle to maintain their regular feeding patterns and then resort to cheaper and less nutritious alternatives.

Staple Food, Price Change and Consumption in Benin City

In Table 3, the majority of the respondents agreed that rice is the most consumed staple food, with 33.5% of respondents in affirmation, indicating that rice holds a central place in the feeding patterns of most of the residents. Garri was seen to be the second most consumed, as opined by 21.6% of the respondents. Beans come in third, consumed regularly by 19.1% of respondents. Yam and plantain are less frequently consumed as staple foods, with regular consumption reported by 14.4% and 11.4% of the respondents, respectively. The data show that while yam and plantain are important in the diet of a portion of the population, they do not have the same widespread regularity in consumption as rice or beans.

Table 3. Common staple food consumed and cost

Staple Food Regularly Consumed in Households		
Staple Foods	Responses	
	<i>N</i>	<i>Percent</i>
Rice	360	33.5%
Garri	232	21.6%
Beans	205	19.1%
Yam	155	14.4%
Plantain	123	11.4%
Total	1075	100.0%
Mean Cost of Staple Food in 2023 and 2024		
Mean Cost of Staple Food	2023	2024
Rubber of Rice	4459	6247
Rubber of Beans	3758	6468
Rubber of Garri	2182	3789
1 Tuber Yam	2168	3524
1 Bunch of Plantain	1174	2073

In the second part of Table 3, we see a significant spike in the mean price of common staple food consumed by the residents in just a year. The cost of a rubber of rice rose from ₦4,459 in 2023 to ₦6,247 in 2024, which is an increase of 40.1%; the price of a rubber of beans saw an even sharper rise, increasing from ₦3,758 to ₦6,468, that is a 72.1% hike in price. The cost of Garri, a key staple for many households, also increased markedly, from ₦2,182 to ₦3,789, an increase of 73.7%. Yam, another critical food item, saw its price rise from ₦2,168 to ₦3,524, a 62.6% increase. Additionally, the cost of a bunch of plantains almost doubled, increasing from ₦1,174 in 2023 to ₦2,073 in 2024, a 76.6% increase.

These price increase, are signs of inflation and economic challenges, which affects the affordability of staple foods. These staple foods are shown to constitute the primary sources of nutrition for many households (Table 3), and this inflation have likely exacerbated food insecurity, forcing residents especially for low- and middle-income households, to reduce consumption or opt for less nutritious alternatives, and this may worsen health conditions due to inadequate access to balanced meals.

Dynamism in Residents Feeding Pattern

In Table 4, one of the most striking observations is the drastic reduction in the percentage of respondents who consumed three meals a day (1-1-1), which was 52.4% in 2023, but by 2024, it dropped to just 25.7%. Also, there is a notable increase in the percentage of respondents consuming just one meal per day (0-0-1), as the statistics climbed dramatically from 2.4% in 2023 to 27.0% in 2024. At the same time, the percentage of those consuming two meals a day (1-1-0 and 1-0-1) has also decreased. The "1-1-0" meal pattern dropped from 5.1% to 2.4%, and the "1-0-1" pattern showed a slight decline from 20.1% to 17.9%. This significant shift reflects the financial pressures residents are facing, as more people are shifting from three meals daily to a lesser number of meals per day.

Table 4. Respondents' Feeding Pattern 2023 - 2024

Respondents Feeding Pattern				
Feeding Pattern	2023		2024	
	Frequency	Percent	Frequency	Percent
1-1-1	196	52.4	96	25.7
1-1-0	19	5.1	9	2.4
1-0-1	75	20.1	67	17.9
0-1-1	64	17.1	52	13.9
0-0-1	9	2.4	101	27
0-1-0	6	1.6	24	6.4
1-0-0	5	1.3	25	6.7
Total	374	100	374	100

With rising inflation and economic challenges, residents have experienced increased difficulties in affording basic food items like rice, yam, beans, and cassava. As a result, many households have been compelled to reduce meal sizes, cut down on the frequency of meals, or resort to cheaper and less nutritious alternatives. These measures are taken as coping mechanisms to keep up and manage food expenses.

Table 5. Percentage in the Feeding Patterns between 2023 and 2024

Feeding Pattern	2023 (%)	2024 (%)	Percentage Change (%)
1-1-1	52.4	25.7	-50.95
1-1-0	5.1	2.4	-52.94
1-0-1	20.1	17.9	-10.95
0-1-1	17.1	13.9	-18.71
0-0-1	2.4	27.0	1025.00
0-1-0	1.6	6.4	300.00
1-0-0	1.3	6.7	415.38

Also, in Table 5, we can see the percentage metrics of the change in feeding pattern of the residents. The data showed a 50.95% reduction in the "1-1-1" feeding pattern, meaning that the percentage of respondents who consume three meals daily has reduced by more than half. While those at the lower margin of one square meal daily saw a massive spike in percentage, for example, the "0-0-1" feeding pattern increased by 1025.00%, "0-1-0" and "1-0-0" patterns increased by 300.00% and 415.38% respectively.

Relationship Between Rising Cost of Staple Foods and Daily Feeding Pattern

According to Aluko et al., 2022, as food prices increase, households are forced to adjust their daily feeding patterns to cope with limited financial resources. This often results in reduced meal frequency, smaller portions, or less nutritious alternatives, all of which have adverse effects on health and well-being. Understanding the relationship between the rising cost of staple foods and daily feeding patterns is vital for addressing food insecurity and ensuring equitable access to sufficient and nutritious meals. Using the Pearson Moment Correlation, the relationship that exists between staple food inflation and change in feeding pattern of the residents in Benin City was analysed, and the result is in Table 6.

Table 6. Correlation between rising cost and feeding pattern of residents

Correlations		Feeding 2023-2024	Cost	Feeding 2023 - 2024	Pattern
Feeding Cost 2023 – 2024	Pearson Correlation	1		.136**	
	Sig. (2-tailed)			.009	
	N	372		371	
Feeding Pattern 2023 – 2024	Pearson Correlation	.136**		1	
	Sig. (2-tailed)	.009			
	N	371		373	

** . Correlation is significant at the 0.01 level (2-tailed).

The Pearson correlation coefficient between the two variables is $r = 0.136$, and this correlation is statistically significant ($p = 0.009$), indicating a weak but positive relationship between changes in monthly feeding costs and changes in daily feeding patterns. This significant relationship between these two variables implies that food price inflation exerts pressure on household food consumption behaviours, forcing affected households to make adjustments in their daily feeding patterns to cope with the increased financial burden. This result agrees with the works of Aluko et al. (2022), as they also found a link between food inflation and adjustment in feeding behaviour amongst residents of Ido Local Government Area of Oyo State. Although the correlation is relatively weak, it is important to note that even a modest positive association reflects the sensitivity of feeding patterns to rising costs. Households facing higher food prices may experience constraints in their ability to maintain regular meal frequency or quality and may lean towards compromised nutrition and food security. The significance of this correlation stresses the impact of economic factors on feeding behaviours and highlights the need for policies that address rising food prices, particularly in vulnerable communities where even small increases in costs can lead to substantial changes in dietary habits.

4. CONCLUSION

This study showed that the rising cost of staple foods affects the daily feeding patterns and nutritional well-being of households. Reduced meal frequency and lower food quality, among others, are various coping strategies adopted by households. Thus, there is an urgent need for targeted policy interventions, including food price stabilization, support for small-scale farmers, expansion of social welfare programs, promotion of subsistence farming, and community-based relief initiatives. Furthermore, the study highlights the importance of addressing infrastructural and security challenges to make food distribution easy and affordable. Finally, the findings can be used by policymakers, development experts, NGOs, and residents in making well-informed decisions geared towards the enhancement of food security and public welfare.

5. COMPETING INTEREST

None to declare

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