

Food Consumption and the Covid-19 Pandemic in Nigeria

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DOI: <https://doi.org/10.51584/IJRIAS.2024.911058>

Received: 17 November 2024; Accepted: 26 November 2024; Published: 23 December 2024

ABSTRACT

The study was conducted to examine food consumption and the Covid-19 pandemic in Nigeria. Two-stage random sampling techniques were used to select 120 households as sample size for the study. Data collected were analyzed using descriptive statistics (such as mean, frequency distribution count and percentages) and inferential statistics (multiple regressions). The result of the findings showed that respondent in the study area were relatively young, married with high literacy level. More so, factors include lockdown, social distancing, ban on interstate movement, and reduce meal number were the major factors influencing food consumption pattern during Covid-19. Lastly, age ($p < 0.05$), sex ($p < 0.10$), lock down ($p < 0.01$), social distancing ($p < 0.01$) and inter State movement restriction had inverse relation with food consumption during the Covid-19 while education ($p < 0.01$), occupation ($p < 0.10$), family size ($p < 0.01$) and monthly income ($p < 0.05$) had direct relationship with the food consumption pattern during the Covid-19. The study recommended that cases of pandemic such as this or its kind, measures that should be taken, should be one that favours the country's situation as not everyone were able to get food or the means to get food during the period of lockdown and other policies that were introduced to contain the spread of the disease

Keywords: Food; Consumption; Pandemic; Covid-19

INTRODUCTION

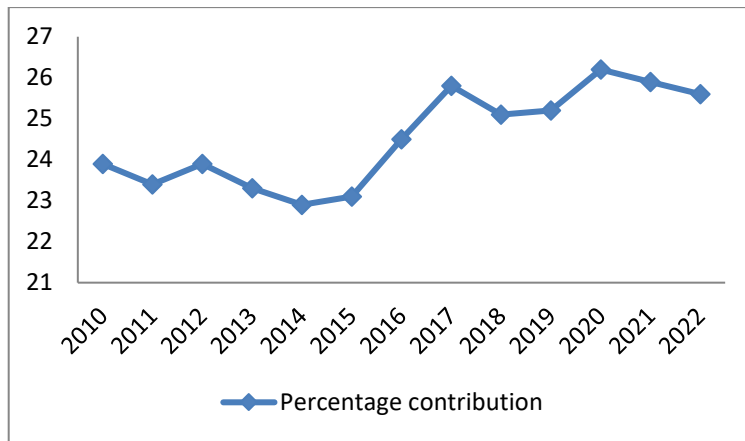
Agriculture serves as the basis of food production, supplying a vast array of crops, livestock, and fisheries products that form the basis of diets worldwide (Food and Agriculture Organization (FAO), 2021). This diversity cut across staple crops like rice, wheat, and maize, which provide essential carbohydrates, to protein sources such as meat, dairy, and fish. This contributes vital proteins and nutrients to people's daily meals. These agricultural products collectively comprise the variety of foods that contribute to balanced and nutritious diets (International Food Policy Research Institute (IFPRI), 2021). With the continuous increase in global population, the demand for food rises in parallel. Agriculture shoulders the responsibility of meeting this demand, which is not solely about producing more food but also ensuring it is accessible, safe, and of high nutritional quality (Amewu *et al.*, 2020).

The COVID-19 pandemic, an unparalleled global crisis, left an indelible mark on every facet of human existence, reshaping economies, societies, and daily lives in unprecedented ways. As the pandemic unfolds across the globe, there is a great concern about the agricultural sector, food supply, prices and the global poverty level (Amewu *et al.*, 2020, Stanciu, *et al.*, 2020; Kudaisi and Olomola, 2021). The government's earnest endeavours to curb the community spread of the pandemic has introduced a dual-edged impact on the livelihoods of its citizens. While these efforts are paramount for safeguarding public health, they have also brought about unintended consequences that resonate across various socio-economic strata. The repercussions manifest in the form of exacerbated rates of unemployment, particularly among employees in the private sector, as well as in small and micro enterprises. These reverberations, in turn, cast a shadow over the

agricultural system, amplifying the impact on food consumption patterns in Nigeria (Kudaisi and Olomola, 2021).

In Nigeria, agriculture has played a significant and multifaceted role in the economic growth contributing 21.07% to real GDP growth in the first quarter of 2024 and employs over 70% of the population of Nigeria. The country's economy has a strong historical reliance on the agricultural sector, and its contributions extend far beyond food production. Figure 1 revealed that from 2010 to 2019, Nigeria's agricultural sector is seen to have demonstrated a degree of stability in its contribution to the country's GDP. The Figure 1 reveals that percentages ranged from 23.1% to 25.2%, showcasing the sector's resilience and consistent role in the economy

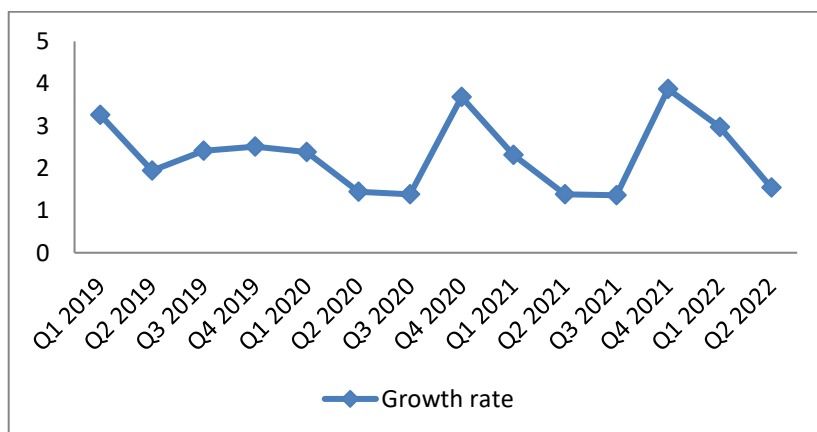
Figure 1: Yearly contribution of Agriculture to GDP



Source: National Bureau of Statistics, 2022

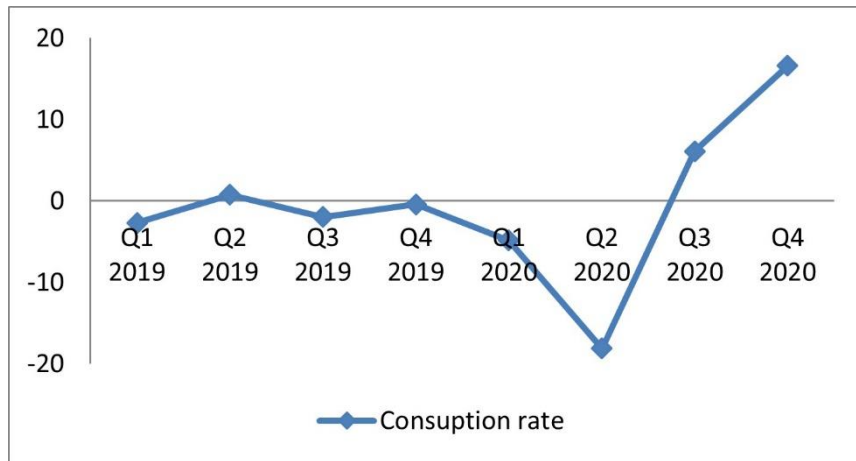
The significant contribution during the pandemic in 2019 to 2020 is evidenced by the sector's peak contribution of 26.2% in 2020. To shield critical sectors from the pandemic's disastrous effects, the CBN enacted a series of innovative measures, affirming agriculture's pivotal status. A targeted credit facility of 50 billion naira was introduced as a stimulus package for firms across the agricultural value chains, health, aviation, and Small and Medium Scale Enterprises (CBN, 2020). Further enhancing the accessibility of financial aid for farmers, the CBN approved the disbursement of 75-billion naira loans under the Nigeria Incentive-Based Risk Sharing System for Agricultural Lending (NIRSAL). By reducing the interest rate from 9% to 5%, the apex bank aimed to facilitate greater access to funds for farmers, thus catalyzing increased productivity and fortifying the agricultural backbone of the nation. Despite these interventions, the uncertainty inherent in the COVID-19 era introduced a layer of complexity to the food security in the country as showed in Figure 2 and 3.

Figure 2: Crop-production-growth in Nigeria between 2019 - 2023



Source: National Bureau of Statistics, 2022

Figure 3: Household consumption in Nigeria between 2019 – 2020



Source: National Bureau of Statistics, 2022

Crop production in Nigeria in the pre-pandemic period reveals a noticeable upward trend in growth rates from 2019 to 2020. This demonstrated the sector's capacity to adapt and expand, aligning with growing demands and potential opportunities.

However, as the pandemic unfolded, its impact began to ripple through the sector, as evidenced by the ensuing quarters of 2020, which saw a decline in growth rates. The subsequent year, 2021, revealed a more complex pattern in crop production growth. The impacts of the pandemic were also manifest in the realm of household consumption in Nigeria. The first half of 2020 saw significant negative growth rates, reflecting the widespread economic uncertainties and mobility restrictions caused by the pandemic. The latter half of 2020 and subsequent quarters of 2021 saw a marked reversal in trends, potentially indicating a recovery in consumer confidence and spending patterns.

These complex dynamics and the significant impact of COVID-19 on food consumption patterns in Nigeria has necessitated this study. The pandemic was observed to have affected various aspects of society and economy. This research aimed at describing the socio-economic characteristics of respondents; investigate the factors affecting food consumption pattern; and determine the effect of COVID-19 pandemic on food consumption pattern.

METHODOLOGY

The study was carried out in Federal Capital Territory, Abuja, Nigeria which is located within the latitude 9° 10' 32" North and 7° 10' 50" East. It covers land area of 2,824 square miles (7,315 square kilometers) with a projected population of 214,878,246 in 2022. Two-stage random sampling techniques were used to select 120 households as sample size for the study. Primary data were elicited from the respondent with the aid of a structured questionnaire complemented with interview schedule using Kobotool box. The study could address data collection limitations, such as potential sampling biases or unrepresentative socio-economic groups in the survey. This research recognized limitations, including sampling biases and the risk of underrepresenting certain socio-economic groups within the survey area. This was solve through the use of stratified random sampling to ensure proportional representation of socio-economic groups as well as increasing sample size to minimize biases and enhance generalizability. Data collected were analyzed using descriptive statistics (such as mean, frequency distribution count and percentages) and inferential statistics (multiple regressions). The implicit form of the multiple regression model is specified as follows;

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}, X_{11}, X_{12} + \mu)$$

Where,

Y = Food consumption (Average expenditure in Naira)

X_1 = Age (years)

X_2 = Gender (male and female)

X_3 = Education level (None, Primary, Secondary, Tertiary)

X_4 = Occupation of household head (1 if employed and 0 if otherwise)

X_5 = Household size (Number)

X_6 = Monthly income (Naira)

X_7 = Lockdown (Average weight values from Likert Scale Ratings)

X_8 = Social distancing (Average weight values from Likert Scale Ratings)

X_9 = Ban on Inter-State Movement (Average weight values from Likert Scale Ratings)

X_{10} = Closure of Canteens (Average weight values from Likert Scale Ratings)

X_{11} = Reduce meal number (Average weight values from Likert Scale Ratings)

X_{12} = Purchase of food on credit (Average weight values from Likert Scale Ratings)

The explicit specification of the functional forms to which the data was fitted included:

Linear: $Y = \beta_0 + \beta_1 X_{1i} + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_n X_n + e$

Double logarithmic/Cobb-Douglass: $\ln Y = \ln \beta_0 + \beta_1 \ln X_{1i} + \beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 \ln X_4 + \beta_5 \ln X_5 + \beta_n \ln X_n + e$

Exponential: $\ln Y = \beta_0 + \beta_1 X_{1i} + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_n X_n + e$

Semi-logarithmic: $Y = \ln \beta_0 + \beta_1 \ln X_{1i} + \beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 \ln X_4 + \beta_5 \ln X_5 + \beta_n \ln X_n + e$

Where,

β_0 is the constant term

$\beta_1 - \beta_n$ are the regression parameters to be estimated

e_i is the error term

Likert type rating scale

The factors affecting food consumption pattern was measured using 5 point likert type rating scale of strongly agreed =5, agreed = 4, Neutral =3, disagree =2 and strongly disagree = 1. This was summed up that is $5+4+3+2+1 = 15$ and divided by 5 to get a mean value of 3.0. The decision rule here is any mean points ≥ 3.0 was regarded agreed while < 2.0 was be regarded as disagree.

RESULTS AND DISCUSSION

Socio-Economic Characteristics of Respondents

As shown in Table 1 the mean age of respondents in the study area was 41, this implies that the respondent is relatively young, which could imply a workforce that is active and possibly resilient to economic shocks like those experienced during the COVID-19 pandemic. The younger respondent may be more adaptable to changes in food consumption patterns due to their generally lower health risks and greater mobility compared to older age groups. This corroborates with the study of Ebukiba and Anthony (2019) who reported that

farmers within the age of 41 were productive age, matured resilience with in depth tenacity for high productivity and wellbeing status.

Table 1 also revealed that 49.2% of the respondents were married. Married respondents are saddled with the responsibility to make food choices not just for themselves but for their families as well. The pandemic could have introduced new challenges in budgeting, meal planning, and ensuring nutritional adequacy for both spouses and children. This is similar to the study of Chagomoka *et al.* (2016) who reported that higher percentage of married people is an indication of more responsible adults in the study area.

Table 1 showed that 46.7% of the respondents had attended tertiary education, closely followed by those with secondary education (43.3%). The high level of education among respondents suggests a population that is likely more informed and capable of adapting to challenges posed by the COVID-19 pandemic, including changes in food consumption patterns. Educated individuals may have better access to information on healthy diets, food safety, and government assistance programs, enabling them to maintain or adjust their food consumption despite the pandemic’s challenges. This finding agrees with the study of Michael (2016) who reported that respondents who attained higher educational status are expected to have possess rational decision making capability with productive and critical thinking in the face of challenges.

More so, Table 1 revealed that the mean household size was 6 persons per household. This implied that urban families in the study area tend to be relatively smaller compared to traditional or rural family structures. This could be attributed to the changing social norms, economic constraints, and the desire for manageable family sizes. Smaller households often reflects the need for more focused resource allocation, which can influence food consumption patterns and the strategies families employ to secure basic needs in the period of covid-19 pandemic. This finding agrees with the study of Kughur *et al.* (2018), that people are becoming aware of what it cost to maintain a large family and are now conscious that a large family means spending more resources.

Furthermore, Table 4.1 revealed that most (61.7%) had a monthly income above ₦55,000, with a mean income of ₦51,587.50. This implies that most of respondent were earning above minimum wage of ₦30,000 suggesting that the respondent had better financial resilience during the COVID-19 pandemic, which could help maintain stable food consumption patterns. This finding is in contrast with the study of Magaji *et al.* (2021) who reported that majority of the respondents in FCT have low income level. The study added that average monthly expenditure of household was ₦29,120.83 per household.

Table 4.1: Socio-economic Characteristics of respondents

Variables	Frequency	Percentages (%)	Mean
Age			
Less than 41	57	47.5	
41 – 50	48	40.0	
51 – 60	9	7.5	41
61 above	6	5.0	
Marital Status			
Married	59	49.2	
Single	42	35.0	
Divorced	9	7.5	
Widow/Widower	10	8.3	
Educational Status			

No Formal Education	1	0.8	
Primary Education	11	9.2	
Secondary Education	52	43.3	
Tertiary Education	56	46.7	
Household size			
Less than 6	64	53.3	
6 – 10	48	40.0	6
11 Above	8	6.7	
Monthly Income			
Less than 26,000	8	6.7	
26,000 - 40,000	16	13.3	
41,000 - 55,000	22	18.3	51,587.50
55,000 Above	74	61.7	
Monthly Expenditure			
Less than 26,000	51	42.5	
26,000 - 40,000	59	49.2	
41,000 - 55,000	7	5.8	29,120.83
55,000 Above	3	2.5	

Source: Field Survey, 2022.

Factors Affecting Food Consumption Pattern

Table 2 shows the factors affecting food consumption pattern of households during Covid-19 in the study area. These factors include lockdown, social distancing, ban on interstate movement, closure of canteens; reduce meal number, purchase of food on credit. The Table showed that the respondents agreed that lockdown affected their food consumption pattern. The strict lockdown measures imposed to curb the spread of the virus disrupted supply chains, leading to food shortages and higher prices. This situation forced many households to alter their usual consumption patterns, either by reducing meal frequency, shifting to cheaper alternatives, or conserving food. The lockdown also restricted access to markets and grocery stores, making it challenging for people to purchase fresh and essential food items, thereby affecting their dietary habits. The high agreement on this factor underscores the lockdown's profound impact on food security and consumption behavior during the pandemic.

Table 2 also showed that the respondents agreed that social distancing affected their food consumption. Social distancing measures limited physical interaction, which had a direct impact on communal food-sharing practices, particularly in rural and close-knit communities. The restrictions on gatherings also meant that many people could no longer participate in communal dining or social events, where food is often shared. This led to changes in food purchasing and preparation, as individuals had to rely more on home-cooked meals rather than eating out or participating in group meals. Additionally, social distancing affected the operation of food markets and stores, leading to reduced hours and limited access, further complicating food acquisition during the pandemic.. This agrees with the findings of OECD (2020), that social restrictions generated serious inefficiencies and distortions, potentially leading to limitations in food access and to the generation of food

losses.

Furthermore Table 2 showed that respondents agreed that ban on inter-state movement also affected their food consumption severely. The restriction of movement between states disrupted the distribution of food products, particularly in the area that rely on agricultural produce from other areas. This led to shortages of certain food items, increased prices, and a need for households to adjust their consumption patterns. For example, the unavailability of certain staples might have forced households to switch to locally available, but perhaps less preferred, food items. The ban also affected the transportation of food from rural to urban areas, where the demand is often higher, exacerbating food insecurity and prompting changes in dietary habits. This is in consonance with the work of Ivanov (2020) that ban on interstate movement caused delay in delivery of produce to markets. Furthermore, Table 2 showed that respondents agreed that reduced meal ration had impact on their consumption pattern; since food were not in abundance during the pandemic, families had to reduce the number of meals they had per day. This finding disagrees with the study of Eliza *et al.* (2020), that missed meals have a significant impact on children’s health, nutrition, and food security.

More so, there is a consensus among respondents that the reduction of meal rations was a significant response to the challenges posed by the pandemic. Economic difficulties, coupled with the disruptions caused by lockdowns and movement restrictions, led many households to reduce the quantity of food consumed per meal to stretch their resources. This reduction was likely a strategy to cope with uncertain food supplies and to manage finances more effectively during a time of economic strain. This change in food consumption pattern reflects the adaptive measures taken by households to maintain food security under challenging circumstances.

Table 2: Factors Affecting Food Consumption Pattern during Covid 19

Factors	Weighted Sum	Weighted Mean	Remark
Lockdown	561	4.68	Agree
Social Distancing	555	4.63	Agree
Ban on Inter-state Movement	545	4.54	Agree
Closure of Canteens	355	2.96	Disagree
Reduce Meal Ration	384	3.20	Agree
Purchase of food on Credit	359	2.99	Disagree

Source: Field Survey, 2022.

Weighted Mean from 3 and above = Agree

Weighted Mean less than 3 = Disagree

Effect of Covid-19 Pandemic on Food Consumption of Household

Table 3 shows the result of the multiple regression model on the effects of Covid-19 pandemic on the food consumption pattern of households. Semi-log regression model was the lead equation because of the high number of significant variables and conformity with *a priori* expectation. From the Table, the R-square was 0.6840 which implies that 68% of the variation in the monthly expenditure on food by household is explained by the independent variables provided in the model while the remaining 32% is due to variables not captured or error. The F-statistic was significant at 1% level of probability and as such indicating a good fit of the model and that all the variables have joint influence on the dependent variable.

The coefficient of age (-0.0120) was negatively significant at 5% level of probability, this suggests that there is an inverse relationship between age and consumption patterns among the respondents during the pandemic. In

other words, as age increases, there is a tendency for consumption patterns to decrease. This is because older individuals, who might be more susceptible to severe illness from COVID-19, could be more cautious about exposure to external environments. This heightened concern for health might lead them to limit their interactions, including trips to stores or restaurants, which could result in reduced consumption of non-essential items. This is in agreement with the work of Barbara (1999), that food intake declines with age. The coefficient of sex (-0.1129) was negatively significant at 10% level of probability, suggesting that households with a higher number of males tend to exhibit lower levels of food consumption during the pandemic. This is in consonance with the work of Stacey *et al.*, (2012) that gender differences influences food preferences and choices.

The coefficient of educational level (0.0371) was positively significant at 1% level of probability, indicating that as the education level increases the food consumption pattern also increases, this is because individuals with more education may have a deeper understanding of the importance of a balanced diet and the nutritional needs of their families. This awareness can lead to a conscious effort to prioritize diverse and nutrient-rich food choices even during the pandemic. This finding is in agreement with the work of Wendy *et al.* (2009) that women of lower educational attainment are more likely to eat unhealthy diets than women of higher educational attainment.

The coefficient of occupation (0.2044) was positively significant at 10% level of probability, indicating that people who engage in occupation that earns higher returns will have high food consumption pattern. This finding agrees with the work of Konstantinos *et al.* (2009) that occupation may also affect diet by creating environmental or social networks that can influence behavioral health habits.

The coefficient of family size (0.0855) was positively significant at 1% significant level, this is an indication that the higher the number of members in the family, the higher the demand for food. This is in agreement with the work of Gretel *et al.*, (2002), that larger household size is widely regarded as a risk factor for malnutrition in developing countries. The coefficient of monthly income (8.4600) was positively significant at 5% level of probability, indicating that as monthly income increases, the food consumption pattern also increases significantly. This finding agrees with the work of Evans *et al.* (2015) that low-income individuals tend to have less healthful diets and run a higher risk for chronic diseases.

The coefficient of lockdown (-0.1827) was negatively significant at 1% level of probability, this indicates that during lockdown period there was reduced food consumption pattern due to the fact that many activities were put on pause, and people were forced to stay home for the period. This agrees with the work of Sim *et al.* (2020) that The constraints imposed by the lockdown and the fear of disruptions in the food supply chain have caused a change in purchasing behavior such as an increase in food stocks at home or the quantity and type of food bought.

The coefficient of social distancing (-0.1707) was also negatively significant at 1% level of probability, indicating that as social distancing persist, the consumption pattern of household decreases, this is because during the period when social distancing was imposed, people could not interact freely with one another and as such could not access the market to get their preferred food items when needed. This is in agreement with the works of Dubey *et al.* (2020); Chu, Alam, Larson and Lin (2020), that Social distancing measures disrupted daily life and had negative consequences on wellbeing.

The coefficient of ban on inter-state movement (-0.1384) was negatively significant at 5% level of probability, this is an indication that ban on inter-state movement reduced the food consumption pattern, as a result of the difficulty in getting food from where they are produced to where they are needed. This is in agreement with the work of Ivanov (2020) that ban on interstate movement caused delay in delivery of produce to markets.

The coefficient of reduced meal ration (-0.0675) was negatively significant at 10% level of probability, indicating that reduced meal number lead to reduced food consumption pattern, this is because during the period of Covid-19 families had to reduce their meal number in order to save food for later consumption. This finding is in agreement with the works of Chagomoka *et al.* 2016; Wabwoba *et al.* (2015) and Ngidi *et al.* (2014) that variety of coping mechanisms used by the population during periods of food shortage, included

changing feeding habits by decreasing the amount and frequency of food intake.

The coefficient of purchase of food on credit (-0.0234) was negatively significant at 10% level of probability, indicating that the purchase of food on credit lead to reduced food consumption pattern, this is because some family head were artisan, therefore required to go out on a daily basis in other to put food on the table, with the pandemic and all its restrictions they could not go out and had to result in buying food on credit. This is in agreement with the work of Human Rights Watch (2020) that more than 80% of Nigerians work in the informal sector, which includes a wide range of occupations such as street traders, taxi drivers, tradesmen, artisans, food vendors and hairdressers.

Table 4.4 Effect of Covid-19 Pandemic on Food Consumption of Household

Variables	Coefficient	Standard Error	t-value
Age	-0.01197	0.00589	-2.03**
Sex	-0.11292	0.06510	-1.73*
Marital status	0.06437	0.07643	0.84
Education Level	0.03708	0.01084	3.42***
Occupation	0.20438	0.10863	1.88*
Family Size	0.08548	0.01870	4.57***
Monthly Income	8.46e-06	3.88e-06	2.18**
Lockdown	-0.18271	0.04692	-3.89***
Social distancing	-0.17072	0.03457	-4.94***
Inter-state Movement Restriction	-0.13837	0.06845	-2.02**
Closure of canteens	0.22547	0.02449	0.92
Reduce meal number	-0.06749	0.03455	-1.95*
Purchase of food on credit	-0.02335	0.03461	-0.69
Constant	10.26454	0.46571	22.04***
R-squared	0.6840		
Adj R-squared	0.6453		
F-value	17.65***		

Source: Field Survey, 2022

***= Significant at 1% level of probability, **= Significant at 5% level of probability, and

*= Significant at 10% level of probability.

CONCLUSION

From the findings, it was noted that the respondents were in their economical and active age. Also, majority of the respondents were married. Most of the respondents attained higher level of education. The findings also showed that lockdown, social distancing, ban on inter-state movement, closure of canteens, reduced meal numbers and purchase of food on credit were the factors affecting household food consumption. It was noted that age, sex, educational level, occupation, family size, monthly income, lockdown, social distancing, ban on inter-state movement, and reduce meal number had effect on the household food consumption pattern.

RECOMMENDATIONS

1. Prices of food items should be regulated and set at an amount that is affordable by the common citizens
2. Cases of pandemic such as this or its kind, measures that should be taken, should be one that favours the country's situation as not everyone were able to get food or the means to get food during the period of lockdown and other policies that were introduced to contain the spread of the disease.
3. There should be proper record of citizens, so that in cases that would warrant such measures taken, people that depend on daily jobs to feed themselves and their family members can get good support from the government.

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