Original Research Article

ASSESSING THE CHANGES IN CONSUMPTION PATTERNS OF HOUSEHOLDS DUE TO COVID-19 MEASURES IN KENYA

ABSTRACT

COVID-19 measures brought about several challenges globally. The COVID-19 pandemic impacted many elements of people's lives, including their financial well-being. Households had to adapt their buying patterns and food consumption patterns to cope with the new economic realities, thanks to measures such as a ban on social gatherings, closure of institutions and movement restrictions through lockdowns and curfews. This article assessed the changes in household spending patterns due to COVID-19 interventions in Kenya. The descriptive approach was used in the study, which used a cross-sectional survey using a structured questionnaire to collect data from 246 households. Household intake of meat, dairy, fruits, snacks, and wheat products decreased significantly (p-values <0.001). The findings also demonstrated a substantial drop in the frequency of shopping for pre-packaged meals, snacks, and meat products (p-values <0.001) and a significant rise in the frequency of shopping for vegetables and wheat products (p-values <0.001) and fruits (p-values <0.05). This paper suggests that policies be designed to incorporate aspects of food cultures for city dwellers, working with them to shift how households acquire, purchase, prepare, and consume food during a crisis in order to provide healthier and more sustainable consumption patterns during a crisis.

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Keywords: COVID-19 pandemic measures, Household food consumption, Low-income households, Shopping frequencies

INTRODUCTION

Food consumption is critical for people's health and vitality worldwide. Since the outbreak of the COVID-19 pandemic, measures have precipitated an economic downturn, resulting in a severe loss of livelihoods and income on a global scale (World Bank, 2020). As food consumption patterns and shopping frequencies altered, the resulting loss in purchasing power among individuals who lost income significantly impacted food security and nutrition. This is due to the

importance of income sources in determining household access to food, particularly in urban households employed in the informal sector (Demeke and Kariuki, 2020).

COVID-19 had a significant impact on developing nations such as Kenya, which had already entered a recession by late 2019 (UNCTAD, 2020). The World Bank predicted that COVID-19 shocks would push the majority of urban dwellers into extreme poverty by the end of 2020 (Al-Samarrai *et al.,* 2020). The pandemic vulnerabilities disproportionately impacted urban dwellers, particularly low-income households, compared to their rural counterparts. During the COVID-19 epidemic, it was estimated that just 26% of urban inhabitants in key towns in Kenya were in paid employment, with only one person in every five homes having a consistent income (Orkin, 2020). Notably, a sizable fraction of the paid population lost their jobs as a result of layoffs and wage cuts (Council, 2020). Furthermore, non-essential companies were closed, causing business hours to be disrupted and impacting access to vital food services (Kansiime *et al.,* 2021). Border restrictions inside Kenya and neighboring countries restricted the movement of products, raising the possibility of food shortages owing to disrupted supply chains. Furthermore, partial and total lockdown measures implemented at the regional and national levels, such as the closure of schools, institutions, workplaces, non-essential shops and restaurants, banned events, and mobility restrictions, altered how people accessed food, the different types of food they ate, and how the food was prepared (Janssen *et al.,* 2021). However, some COVID-19 regulations hampered food distribution to vulnerable communities. COVID-19 pandemic measures had a negative impact on the socioeconomic position of urban people, contributing to variances in dietary choices and eating behaviors. Socioeconomic status directly impacts individual health, influencing lifestyle patterns such as food habits (Béné, 2020). With the pandemic, the cost of nutritious and wholesome foods, such as fruits and vegetables, has become a serious concern. As a result, most city dwellers began to consume cheaper, more convenient, and sometimes harmful foods. This shift may result in poor nutrition and poor health, weakening the immune system and exposing one to opportunistic illnesses (Shupler *et al.,* 2021).

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As a result, the purpose of this article is to examine the changes in household spending patterns caused by COVID-19 policies in Kenya. Its specific goal is to examine household food consumption before and after the COVID-19 pandemic in Kenya, as well as household food shopping frequency before and after the COVID-19 pandemic.

MATERIALS AND METHODS

Study Area

The research was carried out in the wards of Kaptembwa, Kapkures, and Rhonda in Nakuru West sub-county, Nakuru County. The sub-county was chosen on purpose because it is home to a typical low-income Kenyan urban household. The majority of these residents rely on their daily salaries and any savings they may have amassed over time. The area has a population of around 616,046 households, with 3-4 household members on average (KNBS, 2019). Nakuru County has a land area of 7,510 KM2 and is located between longitude 36° 01′ and 37° 15′ east and latitude 0° 17′ and 1° 20′ south. Figure 1 depicts the research area's location.

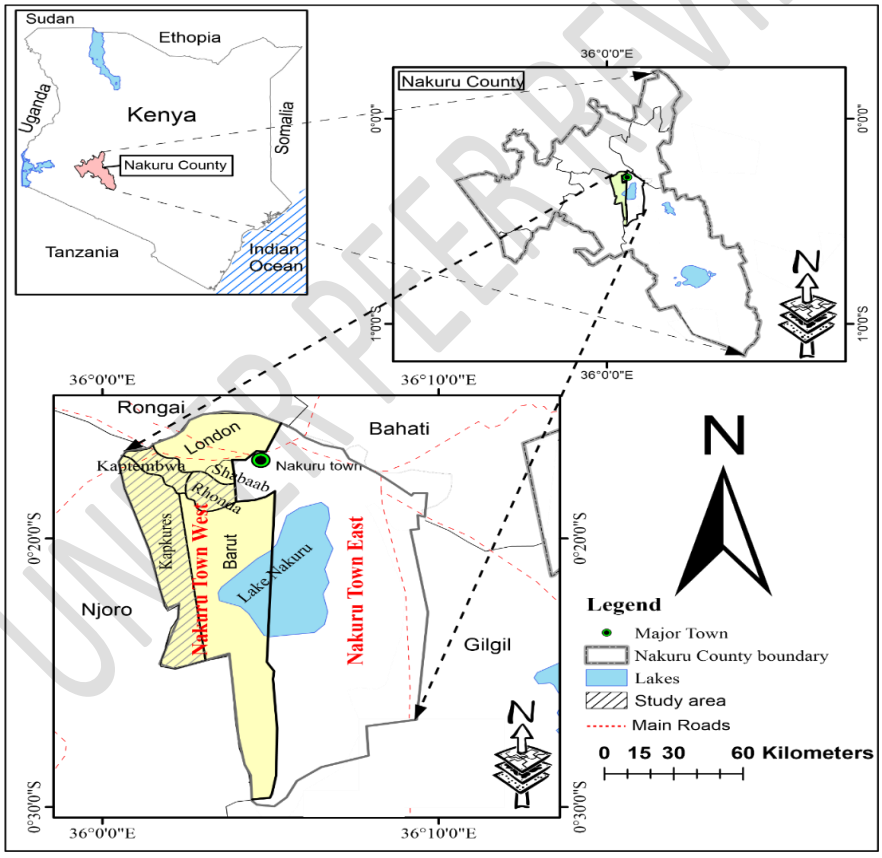

Figure 1: Map of Nakuru West Sub-county

Research Design

This study used a quantitative research design through a cross-sectional survey.

Sampling

The target population were low-income households in Nakuru West Sub-county, specifically in Rhonda, Kaptembwa and Kapkures wards with a population of 141,291 households (KNBS, 2019).The study's minimum desired sample size was determined using the probability sampling technique through a simple random sampling procedure to select the households to be interviewed. The required sample size was determined by proportionate to the size sampling methodology (Anderson *et al*., 2007).

$$n = \frac{pqZ^2}{E^2} \quad \text{.....(1)}$$

$$n = \frac{0.8 \times 0.2 \times 1.96^2}{0.05^2} = 245.9 \approx 246 \quad \text{.....(2)}$$

Where; n = Sample size; Z= confidence level (α=0.05); p = proportion of the population containing the significant interest, q=1-p and E= allowable error. It will be assumed that p= 0.8. Therefore, q=1-0.8=0.2, Z= 1.96, and E = 0.05 (acceptable error term) resulting to a sample size of 246 respondents and distributed as follows:

Chart 1: Sample Size Per Ward

Wards	**No. of households**	**Proportion**	**Sample size**
Kapkures	12,099	8.56%	21
Rhonda	33,381	23.63%	58
Kaptembwa	95,811	67.81%	167
Total	**141,291**	**100%**	**246**

Data Collection

The study relied on original data acquired using a standardized questionnaire. The tool used multiple-choice responses to elicit responses from respondents on many questions about their food consumption habits before and after the introduction of COVID-19 measures. Participants were asked to indicate how frequently they consumed eleven kinds of fresh, non-fresh,

convenience, and snack food during and before the pandemic to detect changes in food consumption patterns.

Analytical Framework

The study used descriptive statistics to assess positive, negative, or steady changes in consumer consumption using relevant statistical methods such as frequency, percentage, variance, and mean value (t-test). The goal was to track changes in food-related behavior during the pandemic. Paired-sample t-tests were also employed to discover significant differences in the mean level of food consumption and shopping frequency of different food categories before and after the pandemic. In addition, household variations in food intake were examined by comparing consumption frequencies before and after the pandemic. The study examined whether a household's consumption frequency grew, decreased, or remained unchanged for each of the eleven food groups.

RESULTS AND DISCUSSIONS

Demographic characteristics of respondents

The results also showed that female-headed households were the majority (57%) while male-headed households made up of the remaining 43%. The majority (49%) had completed their secondary school level of education. The distribution of the households with regards to their ages indicated that majority were between the ages of 19-35 years (43%), a common characteristic among urban settlers of young age.

Marital status findings revealed that majority of the respondents (80%) were married with 91% of the households comprising of parents and children. The mean total household size for the households in the study area was found to be 5 members. Household income is important as it determines the overall household food and non-food purchases. Given that the study area is a low-income region, less than half of the respondents (37%) received an income of between KES 5,001 to 10,000.

Table 1: Demographic characteristics of respondents

Categorical Variables		Freq.	Percent
Gender	Female	141	57.32
	Male	105	42.68

Education level of household head	No formal schooling	2	0.81
	Primary	93	37.80
	Secondary	120	48.78
	Tertiary/university	31	12.60
Age of household head	19–35	106	43.09
	36–49	86	34.96
	50–65	47	19.11
	66+	7	2.85
Marital status	Single	27	10.98
	Married	196	79.67
	Widow/widower	9	3.66
	Separated	13	5.28
	Divorced	1	0.41
Household composition	Single households with no children	23	9.35
	Households with parents and children	223	90.65
Household monthly income	<5,000	37	15.04
	5,001 -10,000	93	37.80
	10,001 -20,000	81	32.93
	20,001 - 30,000	26	10.57
	30,001 - 40,000	6	2.44
	>50,001	3	1.22
Continuous Variable		**Mean**	**Std. Err.**
Total household size		5.0285	0.2021

Household food behavior changes after the implementation of COVID-19 measures compared with before

According to Table 2, following the implementation of COVID-19 measures, most households saw less food eaten per family member, owing to less available food in the household. The homes with the highest food consumption were linked to the fact that the majority of members were at home and had food available. The increase in food spending was caused by the variable prices of food items following COVID-19. Households were compelled to trek great distances to find shops with the lowest food prices, and they were obliged to plan their meals

ahead of time in order to budget for the available food resources for survival. Cheap and, in many cases, free food items obtained by some households through their rural social networks may no longer be available following pandemic precautions.

Due to a lack of food supplies, most homes were unable to experiment with new recipes. The few who tried new recipes made the meals heavier in order to last the household members for longer periods of time. Furthermore, households saw a decrease in the number of meals consumed by members. Results also indicated that 72% of those interviewed cited higher food prices for items such as maize flour, fats, and oils following COVID-19, which they attributed to border closures and mobility restrictions. Following COVID-19, an additional 59% of households considerably decreased food waste. This might be related to the fact that households were increasingly interested in effective methods of preserving and organizing meals ahead of time to reduce waste.

Table 2: Household food change behaviors

Variables		**Freq.**	**Percent**
Food eaten	Much less	14	5.69
	A little less	126	51.22
	No change	28	11.38
	A little more	49	19.92
	Much more	29	11.79
Money spent	Much less	6	2.44
	A little less	15	6.10
	No change	13	5.28
	A little more	79	32.11
	Much more	133	54.07
The extent of planning advance meals	Much less	47	19.11
	A little less	36	14.63
	No change	51	20.73
	A little more	87	35.37
	Much more	25	10.16
Any new recipe often used	Much less	47	19.11
	A little less	47	19.11
	No change	100	40.65
	A little more	45	18.29
	Much more	7	2.85

Meals frequency	Much less	32	13.01
	A little less	98	39.84
	No change	59	23.98
	A little more	42	17.07
	Much more	15	6.10
Food prices	Much less	2	0.81
	A little less	2	0.81
	No change	5	2.03
	A little more	59	23.98
	Much more	178	72.36
Any food thrown away	Much less	145	58.94
	little less	31	12.60
	No change	46	18.70
	A little more	12	4.88
	Much more	12	4.88

Household food consumption before and after COVID-19 Paired T-tests

To examine the means of household food consumption before and after the COVID-19 pandemic, paired samples t-tests were used. The data in Table 3 shows that there were significant average differences between several variables. Significant reductions in the frequency of consumption of dairy, meat, fruits, snacks, and wheat items were seen (all p-values<0.001). Notably, there was an overall decrease in household food consumption, and it is worth noting that the study reported consumption changes in all food categories following the COVID-19 measures, indicating that all households faced similar COVID-19 measures, resulting in a convergence in the change in consumption patterns.

The results demonstrate that dairy product consumption decreased significantly before and after the COVID-19 pandemic (t_{238} = -4.067, p < 0.001). Household dairy product consumption was 0.40 unit lower on average than before the COVID-19 pandemic (97% CI [-0.59, -0.21]), demonstrating that households reduced their dairy product consumption after the COVID-19 pandemic. Another substantial difference in household fruit intake before and after the COVID-19 pandemic (t_{235} = -2.883, p < 0.001) was discovered. Household fruit consumption dropped by 0.28 units on average after COVID-19 (95% CI [-0.89, -0.09]).

The average significant difference in meat products consumption before and after COVID-19 ((t_{225} = -5.089, p < 0.001) suggested that household meat consumption reduced by 0.51 units

(95% CI [-0.71, -0.31]). Tan *et al.* (2022) discovered that households were eager to consume more fruits, as demonstrated by an increase in fruit intake, although protein intake (meat and dairy) did not alter much.

Furthermore, the difference in home snack consumption before and after COVID-19 was significant (t_{145} = -2.995, p < 0.001), indicating that household snack consumption decreased by 0.43 units during the COVID-19 pandemic (95% CI [-0.71, -0.14]). The findings are consistent with those of Hoteit *et al.* (2022) and Jia *et al.* (2021), who found a substantial decline in meat, dairy, fruits, sweet snacks, and veggies intake (p-value=0.001) during the COVID-19 pandemic season.

Finally, after the COVID-19 pandemic, household wheat consumption decreased. The average significant difference between wheat products before and after COVID-19 (t_{236} = -4.770, p < 0.001) showed that consumption was 0.47 units lower after COVID-19 (95% CI [-0.67, -0.28]). These findings contradict those of Jia *et al.* (2021), who reported that consumption of wheat products increased following the COVID-19 pandemic as compared to other diets (vegetables, rice, and animal items).

Table 3: Paired samples test for household food consumption before and after COVID-19

		Paired Differences					t	Df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% C. I of the Difference Lower	Upper			
Pair 1	Grains cereals - Grains cereals	0.097	1.445	0.094	-0.088	0.283	1.036	235	0.301
Pair 2	Dairy products - Dairy products	-0.397	1.511	0.098	-0.590	-0.205	-4.067	238	0.000***
Pair 3	Fruits - Fruits	-0.284	1.513	0.098	-0.478	-0.090	-2.883	235	0.001***
Pair 4	Meat products - Meat products	-0.509	1.503	0.100	-0.706	-0.312	-5.089	225	0.000***
Pair 5	Vegetables - Vegetables	0.037	1.184	0.076	-0.113	0.188	0.489	240	0.625

Pair 6	Readymade food- Readymade food	-0.025	1.296	0.103	-0.229	0.178	-0.245	157	0.806
Pair 7	Legumes - Legumes	0.009	1.360	0.090	-0.169	0.187	0.098	226	0.922
Pair 8	Snacks - Snacks	-0.425	1.713	0.142	-0.705	-0.144	-2.995	145	0.000***
Pair 9	Oils and Fats - Oils and Fats	-0.021	1.571	0.102	-0.222	0.180	-0.206	237	0.837
Pair 10	Frozen foods - Frozen foods	0.035	0.547	0.051	-0.066	0.137	0.684	113	0.495
Pair 11	wheat product -wheat products	-0.473	1.525	0.099	-0.668	-0.277	-4.770	236	0.000***

Note: *** 1% significance level; **5% significance level; *10% significance level.

Household food shopping frequency before and after COVID-19 pandemic

The study revealed that following COVID-19 assessments, the mean frequency of shopping in most food categories decreased compared to before. Meat items, ready-made foods, snacks, beans, oils and fats experienced the greatest reduction. The combined proportion of people who lowered consumption based on food category had a negative change in more than 62% of the households. At the same time, frozen foods had the lowest drop rate of change across food categories, which can be explained by the fact that frozen foods are purchased by a small number of low-income households.

To examine the means of household food shopping frequency before and after the COVID-19 pandemic, paired samples t-tests were used. The findings in Table 4 shows that there were substantial average differences between several variables. The findings indicate a significant difference in meat product purchasing frequency before and after the COVID-19 pandemic (t_{234} = -4.153, p < 0.001). The average household meat product shopping frequency was 0.09 units lower than before the COVID-19 pandemic (95% CI [0.05, 0.14]), showing that households reduced their meat product shopping frequency after the epidemic. Another significant difference in household fruit purchasing frequency before and after the COVID-19 pandemic (t_{242} = -2.524, p < 0.001) was discovered. The average household fruit shopping frequency fell

by 0.07 units after COVID-19 (95% CI [-0.13, -0.07]). This helps to explain why most households consume so few fruits.

A significant change in vegetable shopping frequency was also seen before and after the pandemic (t_{238} = -3.735, p < 0.001), indicating a fall in shopping frequency of 0.13 units (95% CI [-0.19, -0.06]). Households' behavior changed once COVID-19 was declared an emergency. In contrast, the study hypothesized that, as a result of the pandemic, households would buy food in quantity out of concern of limited access to food, as established by (Il'in *et al.,* 2021).

However, in low-income areas, the majority of households are accustomed to purchasing food from local markets; thus, it is understandable that fear contributed to them moving less, and thus the purchasing frequency of vegetables decreased, as well as the shifting/closure of open markets. These findings are congruent with those of Jeewska-Zychowicz *et al.* (2020), who showed that in nearly half of the homes surveyed, the frequency of food shopping (including vegetables) had reduced.

The frequency of ready-made food shopping among families differed significantly between the two periods (t_{153} = -3.735, p < 0.001). Due to the epidemic, most households favored buying ready-made foods over making meals, probably due to movement constraints caused by the majority's inability to pay to go to markets to purchase various types of materials. This was indicated by a 0.15-unit increase in ready-made food buying frequency (95% CI [-0.13, -0.07]).

The paired t-test sample statistics show a 0.25-unit increase in snack shopping frequency among households (95% CI [0.17,0.32]). This showed that there was an average positive significant difference in snack shopping frequency before and after the pandemic (t_{194} = -6.504, p < 0.001). The study discovered a positive average significant difference in frozen food shopping frequency before and after the COVID-19 pandemic (t_{72} = 3.734, p < 0.001), indicating a 0.205-unit rise in its shopping frequency.

One potential explanation is that, when open-air markets closed and food became scarce in stores, the demand for frozen foods increased to replace fresh foods and groceries. Despite the fact that wheat products are vital for human consumption, there was a substantial negative average difference before and after the COVID-19 pandemic (t_{240} = -24.839, p < 0.001). This was suggested by a drop of 1.04 units (95% confidence interval [-1.13, -0.96]).

Table 4: Household food shopping frequency paired samples test

Variables		Paired Differences					T	df	Sig. (2-tailed)
		Mean	Std. Dev.	Std. Err. Mean	C.I (95%) diff. Lower	Upper			
Pair 1	DairyPrdctsShopFreqB - DairyPrdctsShopFreqA	-0.012	0.391	0.025	-0.062	0.037	-0.492	242	0.623
Pair 2	MeatPrdctsShopFreqB - MeatPrdctsShopFreqA	0.094	0.346	0.023	0.049	0.138	4.153	234	0.000***
Pair 3	FruitsShopFreqB – FruitsShopFreqA	-0.074	0.458	0.029	-0.132	-0.016	-2.524	242	0.012**
Pair 4	VegetablesShopFreqB – VegetablesShopFreqA	-0.126	0.520	0.034	-0.192	-0.059	-3.735	238	0.000***
Pair 5	ReadymadeShopFreqB - ReadymadeShopFreqA	0.149	0.521	0.042	0.066	0.232	3.556	153	0.001***
Pair 6	LegumesShopFreqB – LegumesShopFreqA	0.047	0.444	0.030	-0.013	0.107	1.548	211	0.123
Pair 7	SnacksShopFreqB – SnacksShopFreqA	0.246	0.528	0.038	0.172	0.321	6.504	194	0.000***
Pair 8	OilsandFatsShopFreqB - OilsandFatsShopFreqA	0.025	0.339	0.022	-0.018	0.068	1.135	242	0.258
Pair 9	FrozenShopFreqB – FrozenShopFreqA	0.205	0.470	0.055	0.096	0.315	3.734	72	0.000***
Pair 10	WheatShopFreqB – WheatShopFreqA	-1.046	0.654	0.042	-1.129	-0.963	-24.839	240	0.000***

Note: *** 1% significance level; **5% significance level; *10% significance level.

CONCLUSION

The purpose of this study was to analyze the changes in household consumption patterns caused by COVID-19 initiatives in Kenya. The study found a significant drop in household consumption of meat, dairy, fruit, snack, and wheat products (p-values<0.001). The findings also revealed a significant decrease in the frequency of shopping for pre-packaged meals, snacks, and meat products (p-values<0.001), as well as an increase in the frequency of shopping for vegetables and wheat goods (p-values<0.001) and fruits (p-values<0.05). The

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majority of food categories investigated after and before the COVID-19 period revealed lower household food consumption habits. COVID-19, in conclusion, induced considerable modifications in household food consumption patterns, with the majority reporting that they had to skip meals, cut food preparation quantities, and shift shopping frequencies.

RECOMMENDATIONS

Policymakers must be more aware of aspects of food cultures for city dwellers, collaborating with them to shift how households acquire, purchase, prepare, and consume food during a crisis in order to provide healthier and more sustainable consumption patterns during a crisis, thereby helping to mitigate the negative effects of epidemics and pandemics.

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