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Consumer Food Preferences and Drivers amongst Ghanaians: Effect of the COVID-19 Pandemic

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Authors' contributions

This work was carried out in collaboration among all authors. Author JAA designed the study, managed the literature searches, performed the statistical analysis and wrote the first draft of the manuscript. Authors MOA and WK designed the study, performed statistical analysis and edited manuscript. All authors read and approved the final manuscript.

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ABSTRACT

Aim: The purpose of this study was to determine the effect of the COVID-19 pandemic on food preference and choice of a group of Ghanaian consumers and to identify the key potential drivers.
Place and Duration of Study: The study was conducted online. Data were collected over a 1-month period in May 2020 during the lockdown period of the COVID-19 pandemic.
Methodology: The study questionnaire was administered through a virtual snowball sampling method using WhatsApp.
Results: The results of the study showed that age and gender were not critical for food choice during the lockdown period of the COVID-19 pandemic. Most consumers (92 %) either stayed away completely from eateries or patronized order/delivery services. Consumers' food and diet choices were skewed toward eating healthier homemade foods to boost their immunity. The main drivers of purchase preference for the Ghanaian consumer during the lockdown period of COVID-19 were the expiration date, quality and sensory characteristics of food products.

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Conclusion: The food preference of the group of Ghanaian consumers ~~used~~ surveyed in this study did not change during the COVID-19 restrictions. The Ghanaian consumer chose healthier homemade foods over food from eateries. The findings of this research work would be beneficial to government agencies and food companies involved in food supply intervention programmes during a pandemic.

Keywords: Consumer preferences; food drivers; COVID-19; Ghana.

1. INTRODUCTION

The Coronavirus Disease (COVID-19) is a zoonotic disease attributed to the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) [1]. The virus is currently spreading through person-to-person transmission [2]. Some reported clinical manifestations of the disease include non-pneumonia and mild pneumonia-like symptoms, dyspnoea (breathlessness - respiratory frequency ≥ 30/min), blood oxygen saturation, respiratory failure, septic shock, and/or multiple organ dysfunctions [3]. COVID-19 patients may also exhibit gastrointestinal symptoms such as diarrhoea, vomiting, and abdominal pain [4], making their faeces potentially infectious [5].

The impact associated with the current high rate of the global spread of COVID-19 on the different sectors of the economy is reshaping livelihoods worldwide. In line with global trends, Ghanaians are also experiencing this 'new normal' way of living.

On the 11th of March 2020, the World Health Organisation (WHO) characterized COVID-19 as a pandemic [6]. Within a month or two of the announcement made by WHO, public health authorities in numerous countries began putting emergency measures in place to help curb and prevent the spread of the SARS-CoV-2 virus. Notably, amongst the measures implemented by most countries were mandatory complete or partial nationwide lockdowns, the restriction of movement of people, prohibition of social and religious gatherings, social distancing measures, and the mandatory wearing of face masks. Also, schools had to shut-down, most public sector and private sector employees resorted to working remotely from home and most institutions reduced in-house personnel drastically.

The first two cases of COVID-19 in Ghana were recorded on the 12th of March 2020 [7]. There was a gradual vertical spread of the infection and then an exponential increase through the communities. On the 17th of June, Ghana had recorded 13,203 confirmed cases of COVID-19 infections with 4,548 recoveries. In July, the reported rate of new infections started to decline with increasing rate of recoveries. As of 31st August 2020, Ghana had recorded a total of 44,658 cases, 43,478 recoveries, and 276 deaths with only 904 active cases [7].

One of the effect of a pandemic is that basic supplies become essential, particularly food. Most people may be unable to access grocery shops to buy food under lockdown conditions due to disruptions in food supply chains. In such instances, designing robust food supply chains becomes equally as important as efforts put in developing and manufacturing vaccines [8]. In a review by Brooks, et al. [9] concerning the separation and restriction of movement of people, it was evident that inadequate supplies of food were a major challenge amongst several populations.

A consumers' choice of food over another is indicative of food preference [10]. Factors such as health, price, convenience, mood, sensory appeal, natural content, weight control, familiarity and ethical concerns affect our food choices [11], with the sensory appeal being one of the most important factors influencing food choice [12]. A study by Pierguidi et al., [13] to study the influence of sensory complexity on preferences for novel gourmet dairy desserts, the author's concluded that sensory complexity had a great influence on consumer preferences. In a related study, health interest, market availability and time pressure were the main drivers for the consumption of plant-based convenience foods.

In as much as consumers want healthy food, the multifaceted nature of food choices makes it difficult to predict ones food preference especially during a pandemic. The objective of this study, therefore, was to determine the effect of the COVID-19 pandemic on food preference and choice of a group of Ghanaian consumers and to identify the key potential drivers.

2. MATERIALS AND METHODOLOGY

2.1 Questionnaire Design and Online Survey

A semi-structured questionnaire based on the Food Choice Questionnaire [11,14] was developed and administered using Google Forms (a survey administration application) and pre-tested using 10 individuals through snowball sampling. This was done to determine ease of selection of response options, to assess the overall understanding of the survey format and estimate the survey completion time. The questionnaire was finalised based on the feedback generated from the pre-testing and administered through a virtual snowball sampling method using WhatsApp [15,13]. WhatsApp was employed for this survey because it is the most popularly used social media in Ghana with about 30% (12 million) of the population being active users [16]. Data were collected over a 1-month period in May 2020. This was done to obtain consumers' actual food preferences during the pandemic lockdown to ensure reliable information. The consumers consented by agreeing to participate anonymously in the survey.

The questionnaire consisted of three sections:- (i) consumers' socio-demographics:- (ii) effect of COVID-19 pandemic on consumers' preference of ready to eat meals and (iii) consumers' grocery shopping/purchasing behaviour during COVID-19 pandemic. Of the 33 questions, there were two open-ended questions, two 7-point hedonic scale style questions and the rest being closed-ended questions with the option to indicate otherwise to the given options.

2.2 Word Clouds

The respondents gave reasons explaining changes in meals caused by the COVID-19 pandemic and how the pandemic has affected their choice of food and diets in general. Before data analysis, the respondents' comments were first streamlined to shorten long phrases. This was done because the questions were open-ended, and consumers gave their comments in a personal style without guidance. The data was then analysed using a word cloud generator (https://worditout.com). The output showed an overview of different words or phrase sizes associated with frequency of mention by the respondents. In the output, increasing font size indicated a greater frequency of mention of the phrase by the respondents.

2.3 Statistical Analysis

Frequencies for the different response options were obtained using descriptive statistics, and Pearson's chi-square test was used to test the significance of the association between variables (age, gender, choice of eating outside of the home, drivers that motivated food choice). A Friedman test was conducted to compare the mean ranks of drivers that motivated respondents' choice of food and a Wilcoxon signed-rank test was used to determine the significant differences. The analyses were carried out using SPSS software (version 20.0, IBM SPSS Statistics Inc., Armonk, NY, USA) at 95% confidence level.

3. RESULTS AND DISCUSSION

3.1 Respondents Socio-Demographic Characteristics

The screening criteria required that respondents should be Ghanaians and at least 18 years of age. A total of 181 respondents completed the survey. Of the surveyed consumers, 54.1% were males, and 45.9% were females (Table 1). Consumers living and working in Ghana participated more in the survey (81.2%). The largest group of respondents were in the age range of 40 - 49 years (40.3%). A large majority of the respondents (95%) had tertiary education, with 80.7% working in the formal sector. Out of the total number of respondents, about 58% indicated that they were working from home.

3.2 Consumer Choice of Meals Before and during the Covid-19 Pandemic Restrictive Measures

Before the COVID-19 pandemic, most of the surveyed consumers (82%) were eating meals outside their homes. Out of this, 49% would frequent sit-in restaurants (Fig. 1). However, during the COVID-19 pandemic restrictive measures, the proportion of consumers visiting sit-in restaurants reduced to 8%. A substantial proportion of consumers are currently not eating outside their homes (56%). This confirms a suggestion by Bezerra et al. [17] that, if Away From Home Foods (AFHF) is defined as the place where food is consumed, the majority of people will not eat outside their homes during

isolation periods of a pandemic. The proportion of consumers ordering their food to be delivered at home or their workplace remains almost the same before (33%) and during the pandemic (36%). In developed and developing countries, consumption of Away-From-Home Food (AFHF) is gradually becoming a habit [17,18]. It is therefore not surprising that the pandemic has not affected the order/delivery of food. Instead, the development of mobile phone applications for home-delivery of foods continues to rise [17,19, 20].

Table 1. Socio-demographic characteristics of survey respondents (n = 181)

Socio-demographic characteristics	Number of respondents, n (%)
Gender	
Female	83 (45.9)
Male	98 (54.1)
Age (yr.)	
18 – 20	2 (1.1)
21 – 29	25 (13.8)
30 – 39	70 (38.7)
40 – 49	73 (40.3)
50+	11 (6.1)
Highest educational level	
Primary	0 (0)
Secondary	9 (5)
Tertiary	172 (95)
Occupation	
Formal	146 (80.7)
Informal	18 (9.9)
Student	17 (9.4)
Working/studying from home	
Yes	105 (57.7)
No	76 (42.3)

Table 2 shows the effect of age and gender on the choice of eating outside the home before and during the COVID-19 pandemic. Before the pandemic, more males ate out and mostly sat-in at eateries during lunch compared to females ($P < .05$). Kwon and Ju [21] and Ma, Bertone-Johnson [22] reported a similar trend of males patronizing eateries significantly more than women. The respondents' age did not significantly affect ($P > .05$) the option of eating outside the home. However, during the pandemic, neither gender nor age affected the choice of eating outside the home. Most of the respondents avoided sit-ins at eateries. A total of 56 % of the respondents were not eating outside the home at all, with 36% of the respondents preferring home "orders and deliveries" (Fig. 1). Similar to the findings from this study, no association was found between age [23] and gender [24,25] when practicing precautionary behaviour during the SARS pandemic in 2002. Contrarily, other studies report that older people and women compared to men are more likely to adopt precautionary behaviour during a pandemic [26,27,28].

3.3 What Meals Did Consumers Mostly Have at Eateries before and during the Covid-19 Pandemic?

Most workers in the formal sector in Ghana are believed to have their lunch at eateries whilst at work, this was confirmed from the survey, when asked what meals they mostly had at eateries, 70.7% of the respondents indicated that they usually had lunch (Fig. 2). This result is in agreement with a previous study on the eating-out habits among Korean adults by Kwon and Ju [21]. In their study, lunch was the most patronized meal from eateries, and people who were employed in "white-collar" occupations with higher than a university degree tended to consume meals away from home frequently. From the socio-demographic data (Table 1), 95 % of the respondents had tertiary education, and 80.7 % worked in the formal sector (Table 1). During the pandemic, the trend changed with the number of people who ate lunch at eateries reducing to almost half (Fig. 2). This could probably be attributed to the COVID-19 scare and the adherence to preventive measures by health authorities in Ghana i.e. staying away from places frequented by a lot of people, such as restaurants. Also the fact that more than half of the respondents (57.7%) were now working from home could contribute to the reduction. The number of respondents that ate breakfast and supper out of the home were also halved as an effect of the pandemic. The lockdown probably gave consumers the opportunity to cook and eat more at home hence about 50% of the respondents did not have breakfast, lunch and supper from eateries.

In recent times, societal changes have made eating outside of the home a common occurrence [29]. Stepping out occasionally to have family and group meals brings some fulfilment to the younger generation. Young adults get to eat out of their parental family home, spend within their food budgets and satisfy peer pressure to eat out [30]. However, the excitement of eating out in groups is now lost

due to the COVID-19 pandemic. Overall, consumers are probably wondering if the eating environment in Ghana is safe and if food handlers can contaminate the food if they are infected with the SARS-CoV-2 virus. As much as consumers want to go back to eating from restaurants, restaurant owners may need to implement convincing food safety measures. Although to date, there is no scientific evidence to indicate that consumers will receive potentially infectious exposures of SARS-CoV-2 via the consumption of contaminated food or the handling of food contact materials or packaging [31].

3.4 Consumer Snacking Behaviour before and during the COVID-19 Pandemic

The COVID-19 pandemic did not affect the snacking behaviour of the surveyed consumers (Table 3). Before the pandemic, about 41% of the respondents would normally snack in-between meals. The results showed that they are not snacking more because of the pandemic. It is worth noting that most respondents (68.2%) are snacking on fruits during the pandemic (Fig. 3). This is possibly due to media information about boosting one's immune system to reduce susceptibility to viral infections. In times

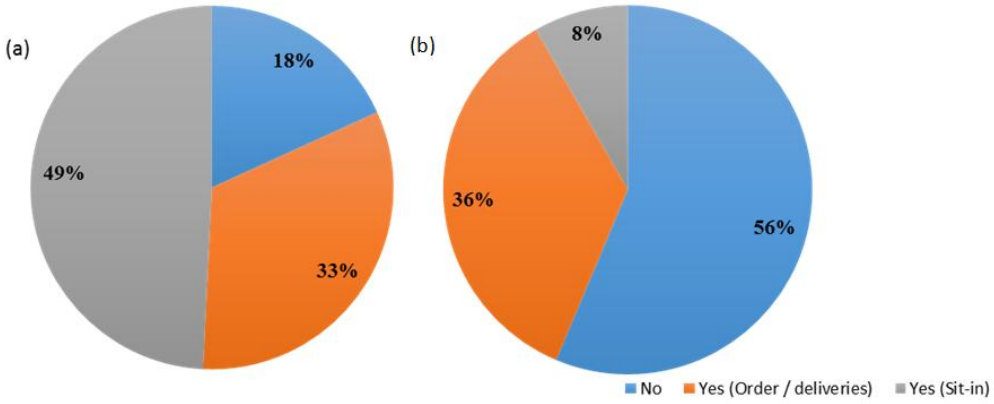


Fig. 1. Consumer practice of eating outside the home before (a) and during (b) the COVID-19 pandemic (n = 181)

Table 2. Effect of age and gender on consumer choice of eating outside the home before and during the COVID-19 pandemic (n = 181)

		No	Yes (Order / deliveries)	Yes (Sit-in)	χ^2	df	*P*-value
Before the COVID-19 pandemic, were you eating outside of the home?							
Gender	Female	13	35	35	6.393	2	0.041
	Male	20	24	54			
Age(yr.)	18 – 20	0	1	1	5.469	8	0.707
	21 – 29	4	7	14			
	30 – 39	15	22	33			
	40 – 49	10	27	36			
	50+	4	2	5			
During the COVID-19 pandemic, are you eating outside of the home?							
Gender	Female	48	31	4	2.456	2	0.293
	Male	54	33	11			
Age(yr.)	18 - 20	1	1	0	4.717	8	0.787
	21 - 29	13	10	2			
	30 - 39	40	25	5			
	40 - 49	40	27	6			
	50+	8	1	2			

- *χ^2, chi-square; df, degree of freedom; and significance at P < .05*

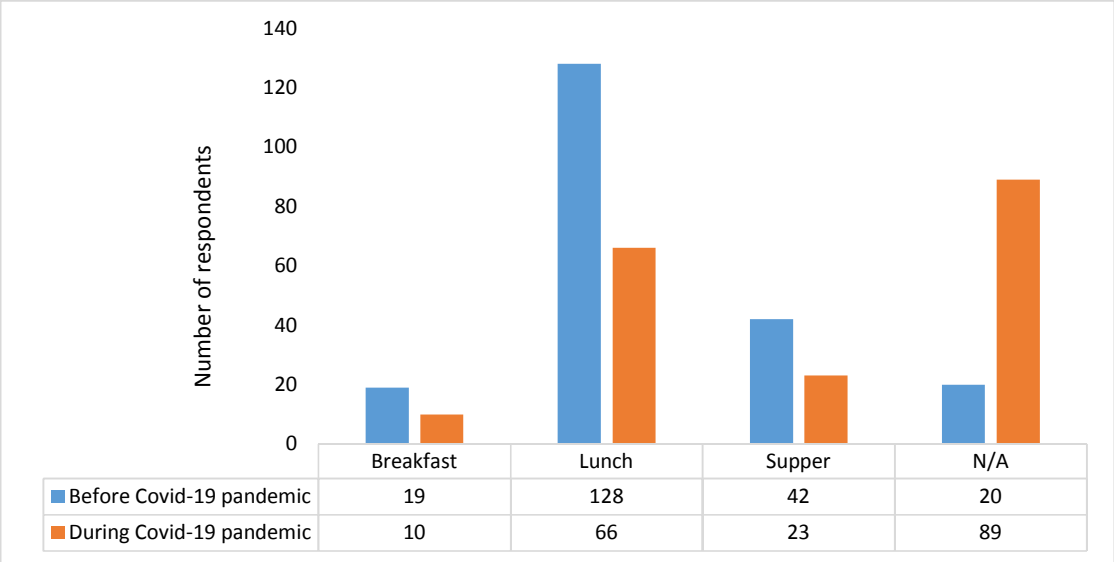


Fig. 2. Meals mostly eaten by consumers at eateries before and during the COVID-19 pandemic (n = 181)

** N/A – Not applicable*

such as a pandemic, when people are quarantined at home, a healthy and balanced nutritional diet containing a high amount of minerals, antioxidants, and vitamins is recommended [32]. Vitamin C is one of the most important antioxidants found in fruits [33,34], hence a possible reason why respondents are snacking more on sources of it. The next most snacked on food by consumers during the pandemic is juice and pastries (Fig. 3). The high frequency of consumption of juice and pastries could be out of boredom resulting in the craving for some comfort foods. During a lockdown, people naturally tend to crave for comfort foods such as foods rich in sugar, fats, carbohydrates, and proteins [35,36].

3.5 Place of Purchase and Drivers That Motivated Consumer choice of Food Products

Fig. 4 shows the different places the respondents purchased their groceries before and during the COVID-19 pandemic. About 79% of the respondents patronized local markets for their food shopping before the pandemic. During the pandemic, 61.9% of the consumers were purchasing groceries from local markets. Markets were still popular since they are relatively affordable, although it can be challenging to implement social distancing to help prevent the spread of the disease from person-to-person. Patronage of supermarkets was not affected much by the pandemic. Consumers were probably much more comfortable shopping in supermarkets due to measures that were put in place by public health authorities to ensure food safety, sanitization, and social distancing. Patronage of tuck shops / convenient shops increased from 14.9% before the pandemic to 18.8% during the pandemic. Tuck shops / convenient shops are usually located within neighbourhoods and easily accessible for food basics such as bread and milk.

Statistical analysis on the different drivers that motivated the choice of food before the pandemic showed some significant differences, $\chi^2(9) = 269.001$, $P = .00$ (Fig. 5). Nonetheless, post hoc analysis with Wilcoxon signed-rank tests conducted showed that there was no significant difference between the two highly ranked drivers, quality and the expiration date of food products. However, during the pandemic, although quality and expiration date of food were still the two highly ranked drivers that motivated the choice of purchase, expiration date was ranked significantly higher than the quality of food ($P < .05$). Disruptions in the food supply chain due to the pandemic may impact the quality of food products available at retail, particularly perishables. Consumers may feel the need to stockpile food in their homes to ensure that they do not go out to do grocery shopping as often as before the pandemic, thereby reducing the risk of contracting the virus. The need to be

overly alert concerning food quality and expiry dates during purchasing then arises. From the study, the patronage of tuck shops increased during the pandemic hence another possible reason why the expiration date of food products becomes more critical. It is highly speculated that food stocks in big supermarkets are replenished more frequently than in tuck shops/convenient shops. Considering the respondents' education level, it is not surprising that the expiration date of food products was an important driver that motivated purchase before and during the pandemic. The sensory characteristics of food, namely, appearance, colour and smell, were ranked similar to preference, availability and price with no significant differences ($P > .05$). This implies that the sensory characteristics of food are critical at the point of purchase, similar to the preference and price of food before and during a pandemic when food may not be readily available. Sensory characteristics serve as additional information about a food product that influences product acceptability and hence consumer preference [37]. However, the influence on consumer food choice by sensory characteristics is highly subjective.

Word cloud analysis of the reasons given by consumers for a change in meals and how the COVID-19 pandemic has affected their choice of food and diet in general, can possibly be used to explain why most of the respondents stayed away from eateries. The respondents ate what was available at home, wanted to eat immune-booster-foods and ate more homemade food. Therefore, as more people work from home (57.7 %) due to the pandemic, they get the opportunity to cook healthy foods of their choice. Although most respondents commented that the pandemic had no major effect on their food choice and diet, their responses were skewed more toward eating healthier, homemade foods that boost their immune systems.

Table 3. The snacking behaviour of consumers before and during the COVID-19 pandemic (n = 181)

	No.	Percent
Do you normally snack in-between meals?		
Yes	74	40.9
No	107	59.1
During this COVID-19 pandemic, are you snacking MORE in-between meals?		
Yes	76	42
No	105	58

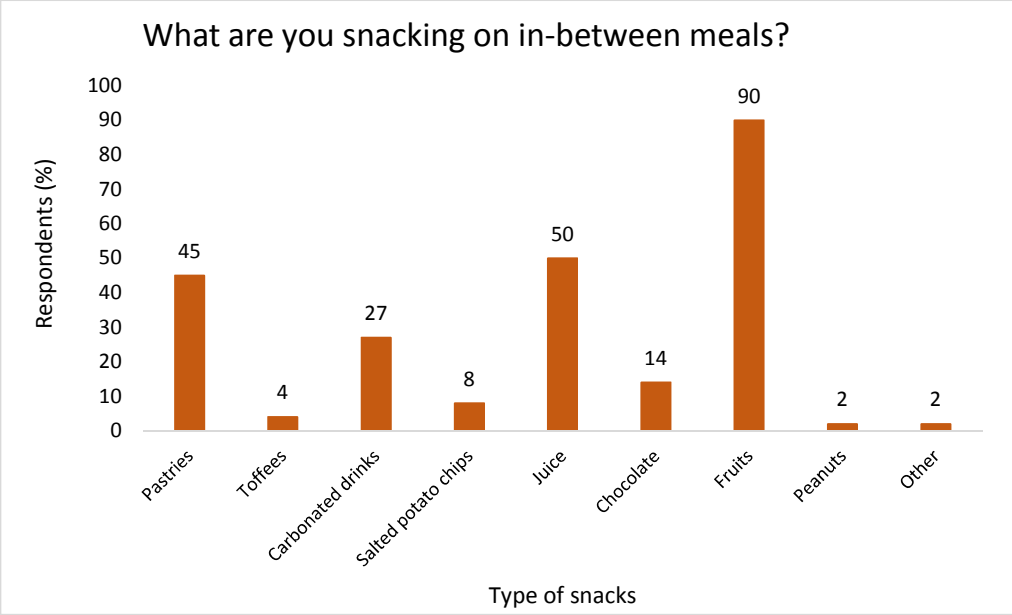


Fig. 3. Food products snacked on by consumers during the COVID-19 pandemic (n = 181)

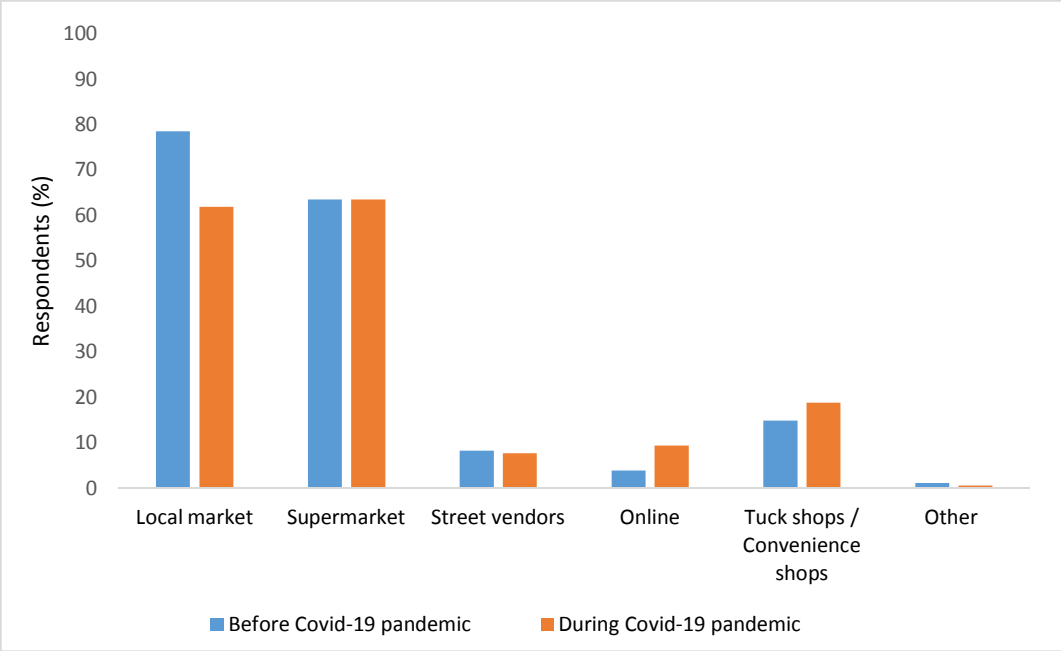
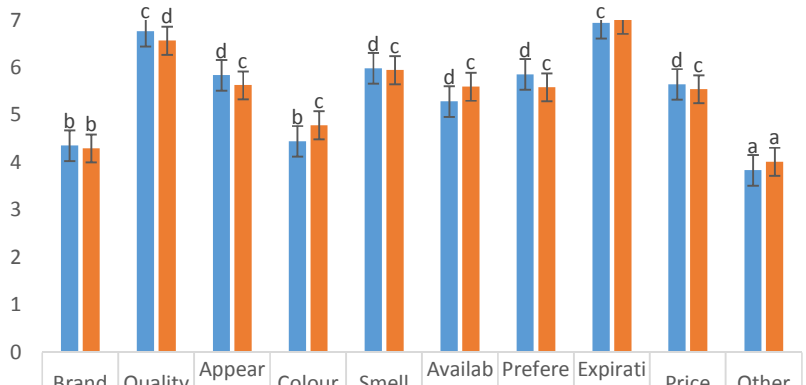


Fig. 4. Place of purchase of food by consumers before and during the COVID-19 pandemic (n = 181)



	Brand	Quality	Appearance	Colour	Smell	Availability	Preference	Expiration date	Price	Other
Before Covid-19 pandemic	4.36	6.77	5.84	4.45	5.99	5.29	5.86	6.94	5.65	3.84
During Covid-19 pandemic	4.3	6.57	5.63	4.79	5.95	5.6	5.59	7.01	5.55	4.02

Fig. 5. Comparison of ranked means of drivers that motivated respondents' choice of food before Covid-19 pandemic

(χ^2 = 269.001, df = 9, P-value < 0.01), and during the Covid-19 pandemic (χ^2 =253.251, df = 9, P-value < .01).
(Friedman Test with Wilcoxon Signed Ranks Test, P < .05)
**Rating scale from 1 = Extremely not important to 7 = Extremely important*

4. CONCLUSION

Based on the study findings, it can be concluded that during the lockdown period of the COVID-19 pandemic, consumers' food and diet choices in Ghana were skewed toward eating healthier homemade foods to boost their immunity. Ghanaian consumers' purchase preferences during the COVID-19 pandemic was driven by the expiration date and quality of food, as well as the sensory characteristics of the food products. A limitation of the study is that only online

participants were involved. A combination of an online and a face-to-face administration of the questionnaire could have given more insight. Further studies including a larger population, especially those in the informal sector with lower levels of education, is recommended.

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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