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Assessment of the Effect of Corona Virus Disease (COVID-19) on Spices Consumption among Households in Nigeria

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ABSTRACT

Spices are good sources of vitamins, minerals and amino acids. There is a growing awareness on the use of spices to control disease. The study assessed the effect of COVID-19 disease outbreak on spices consumption among households in Nigeria. Snowball technique was used to reach respondents by sending them online questionnaire through social media (WhatsApp) platform. The results showed that 58.1% of the respondents sampled were females, with mean age of 42 years (41.68±8.73). All (100.0%) respondents consumed onion, while 83.87% and 82.26% consumed ginger and garlic respectively. Most(77.42%), of the respondents consume onion Nsukka yellow pepper (41.94%) as additive to food. There were significant differences when expenditure on some of the spices was compared during and before COVID-19, onion (t=6.03, p=0.000), turmeric (t=3.82, p=0.000) and Nsukka yellow pepper (t=2.40, p=0.023). Thus, this study concludes that respondents were aware of nutraceuticals compounds in spices in addition to using them for their primary role of enhancing flavor and appeal in foods. Furthermore, awareness of the potentialities of secondary metabolites in spices that yield vast quantities of chemical structures which are the basis for new drugs can aid policy directions in the line of preventive and therapeutic options of the novel disease.

Keywords: *spices, COVID-19, online questionnaire, spices expenditure*

INTRODUCTION

Spices are mostly found in the wild; in the forest (rainforest and mangrove) and savanna (derived, guinea and sudan) agro-ecologies in Nigeria (Adelaja *et al,* 2008). Some of the spices in Nigeria include African nutmeg, black pepper, guinea pepper, cumin, among others (Yahaya, 2021).Indigenous spices in Nigeria include ginger, garlic, onion, lemon grass, wild spinach, African nutmeg, African basil, African locust bean, among others (Adelaja *et al,* 2008). Some cultivated spices are sweet basil, curry, ginger, guinea pepper, African black pepper, and turmeric (Adelaja et al, 2008). They are a good source of vitamins, minerals and amino acids (Purseglove *et al,* 1991). Spices contribute significantly to the health and nutrition security of the populace (FAO, 1986 in Adewale and Oyesola, 2013).

Spices have several uses; they add flavor to dishes or as raw materials in pharmaceutical and skincare industry (Cue Africa, 2021). Also there is growing awareness on the utilization of spices to control diseases (Adewale and Oyesola, 2013). The authors observed that most of the respondents (farmers) (92.2%) utilized spices because of its medicinal benefits, while some used it for culinary purposes as well as religious/cultural reasons. Some of the spices utilized by farmers involved in the study are: The level of awareness in the country may be responsible for the increase in the cultivation of some of the spices in the country. For instance, Nigeria is the fourth largest producer of ginger globally with a production figure of about 31,000 metric tons (Cue Africa, 2021).

The COVID-19 is an infectious disease caused by the corona virus and is spread directly

from person to person via contact with infected persons. It is an infectious disease of high magnitude that necessitated the World Health Organization declaring it a Public Health Emergency of international concern due to the number of countries and deaths involved. Lockdown measure among others was taken by the Nigerian government to curtail the spread of the virus. Disruptions in the food systems notwithstanding, the pandemic has led to increased consumption of ginger and other herbs by people in a bid to boost their immune systems due to the anti-inflammatory and anti-oxidant properties of these spices (Cue Africa, 2021). Thus, this study aimed at assessing the effect of COVID-19 on spices consumption among households in Nigeria. Specifically, this study was set to:

- measure the frequency of spices consumption prior covid-19 era
- analyse the factors influencing habits of spices consumption before and during covid-19 era
- Compare expenditure on spices before and during covid-19 era

MATERIALS AND METHODS

A cross-sectional survey was conducted using online questionnaire to collect data from 62 respondents between June and July 2020 by sharing the link on social media (specifically WhatsApp platform). Snowball technique was used to reach the respondents who were either the household head, mother in the household or other adult household member.Responses were received from only 62 respondents who were willing to fill the goggle forms within the stipulated period. Respondents were from Oyo, Osun, Ogun, Ondo, Lagos, Kwara, Imo, Benue, and Kaduna states including the Federal Capital Territory, Abuja.

Informed consent

Informed consent was obtained from the subjects, as they affirmed their willingness to partake in the survey by responding to the question; "are you willing to be part of this survey?".

RESULTS AND DISCUSSION

Socioeconomic characteristics of respondents

The results presented in Table 1 showed that average42 years (41.68), (I think I'm comfortable with mean) age of the respondents sampled was above half (58.1%) were females, with average (5.08±1.80). household size of 5 members All(100.0%) the respondents had one form of tertiary education or the other, most (77.4%) of them had other postgraduate education apart from Bachelors and Higher National Diploma (21.0%), Ordinary National Diploma/National Certificate of Education (1.6%).

About one-third (29.03%) of the respondents were civil servants. Others were involved in banking, engineering, medical and other professional services (29.03%). Above ninety percent (91.9%) were Christians.

Table 1
Socioeconomic characteristics of respondents.

Variable	Frequency (percentage)	Mean (standard deviation)
Age (bold all the main variables)		41.68(8.73)
Sex: Male Female	 26(41.90) 36(58.10)	
Household size		5.08(1.80)
Educational status: National Diploma/National Certificate of Education Bachelors/Higher National Diploma Other post-graduate	 1(1.6) 13(21.0) 48(77.4)	

Main occupation:		
Academics	8(12.90)	
Farming	6(9.68)	
Civil/Public service	18(29.03)	
Entrepreneurship	7(11.29)	
Teaching	5(8.04)	
Others (Banking, Engineering, Medical and other professional services, music tutor, retiree)	18(29.03)	
Religion:		
Christianity	57(91.9)	
Islam	5(8.1)	
Average monthly income from main occupation		169,702.50(137,925.55)
Average food expenditure before COVID-19 (February)		45,953.11(33,194.49)
Average food expenditure during COVID-19 (May)		62,776.05(49,305.40)

Frequency of spices consumption prior COVID-19 era

Findings from the study revealed that all the respondents consumed the entire selected spices prior COVID-19 pandemic (Table 2). However, all (100.0%), of them consumed onion while larger (83.87%, 82.26%).) of respondents also consumed ginger and garlic respectively On the other hand, less than half (46.77%, 45.16%, 41.94%, 32.26%), of the respondents consumed turmeric Nsukka yellow pepper black pepper and alligator pepper respectively. Onion was most frequently consumed by 59.68 per cent of the respondents daily. Thus, only 40.71 per cent of those who consumed Nsukka yellow pepper did so daily while twenty-five percent of consumers of alligator pepper consumed it once in two weeks or once a month.

Table 2
Frequency of spices consumption prior COVID-19 era

Spices	Consume	Does not consume	Daily	At least thrice a week	At least once a week	Once in two weeks or once a month	No response
Onion	62(100.00)	-(0.00)	37(59.68)	3(4.84)	-(0.00)	1(1.61)	21(33.87)
Ginger	52(83.87)	10(16.13)	8(15.38)	2(3.85)	8(15.38)	3(5.77)	31(59.62)
Garlic	51(82.26)	11(17.74)	9(17.65)	1(1.96)	5(9.80)	7(13.73)	29(56.86)
Turmeric	29(46.77)	33(53.23)	4(13.79)	3(10.34)	4(13.79)	5(17.24)	13(44.83)
Black pepper	26(41.94)	36(58.06)	2(7.69)	2(7.69)	1(3.85)	3(11.54)	16(61.14)
Alligator pepper	20(32.26)	42(67.74)	-(0.00)	3(15.00)	-(0.00)	5(25.00)	12(60.00)
Nsukka yellow pepper	28(45.16)	34(54.84)	3(10.71)	2(7.14)	2(7.14)	3(7.14)	18(64.29)

Assessment of the factors influencing habit of spices consumption

There are different factors that influence respondents' habit of spices consumption. Most of the respondents consume onion (77.42%), Nsukka yellow pepper (41.94%), as additive to food (Table 3). Also, 30.65%, 30.65%, 22.58% and 16.13% respectively have the habit of including ginger, garlic, black pepper and alligator pepper as part of their food. A little above one-third of the

respondents (32.26%) consume ginger for its health benefits; while 29.03% consume turmeric for its health benefits and use as medicine respectively.

This finding differs to that of Adewale and Oyesola (2013) which observed that 92.2% of respondents (farmers) utilize spices for its medicinal benefits. This might be attributed to the emerging nature of COVID -19. However, the findings of the study could infer that spices have potentials for prevention of the disease because some spices recorded significant difference in their consumption during and before COVID-19 outbreak.

Table 3
Assessment of the factors influencing habit of spices consumption.

Spice	Part of food (As food adjunct /added to food)	As medicine	Health	Cultural	Nutritional content of the spices
Onion	48(77.42)	5(8.06)	10(16.13)	1(1.61)	15(24.19)
Ginger	19(30.65)	12(19.35)	20(32.26)	-	11(17.74)
Garlic	19(30.65)	15(24.19)	23(37.10)	-	13(20.99)
Turmeric	7(11.29)	18(29.03)	18(29.03)	1(1.61)	9(14.52)
Black pepper	14(22.58)	5(8.06)	8(12.90)	3(4.84)	4(6.45)
Alligator pepper	10(16.13)	7(11.29)	8(12.90)	3(4.84)	2(3.23)
Nsukka yellow pepper	26(41.94)	6(9.68)	7(11.29)	2(3.23)	6(9.68)

Average expenditure on food items, non-food items and selected spices consumed during and before COVID-19 pandemic

The results showed that average food and non-food expenditure increased when the mean values were compared during and before the advent of COVID-19 pandemic (Table 4). Comparing the means of the average expenditure on food and non-food items using paired t-test, revealed a significant difference. Specifically, average expenditure on food items among the respondents was significantly different during and before COVID-19 pandemic (t= 6.02, p=.000). In the same vein, average expenditure on non-food items during and before COVID-19 revealed a weak significant difference in mean values reported (Table 5). This could be as a result of rising costs of food and non-food items arising from the effect of the pandemic and not specifically that people had more money to spend. For instance, in a study by Iheme et al. (2020), more than half of the respondents reported a decline in earnings as a result of the pandemic.

Also, the results revealed that average expenditure on selected spices before and during COVID-19 varied. The average amount expended on all the six selected spices (onion, ginger, garlic, turmeric, black pepper, alligator pepper and Nsukka yellow pepper) increased during the COVID-19 pandemic (Table 4). Furthermore, the significance of changes observed was analyzed using paired samples t-test (Table 5). Thus, the results showed that average expenditure on onion, turmeric and Nsukka yellow pepper during and before the COVID-19 pandemic were significantly different at 1% (onion and turmeric) and 5% level (Nsukka yellow pepper) of significance. Specifically, the mean value of the average expenditure on onion during (1641.51±1379.76) and before (1194.34±138.14) the COVID-19 pandemic were significant (t= 6.03, p=.000). The mean value of the average expenditure on turmeric during (299.29±376.51) and before (137.14±168.83) the pandemic were significant (t=3.82, p=.000). In the same vein, the mean value of average expenditure on Nsukka yellow pepper during (310.00±429.94) and before (339.29±1,176.02) the COVID-19 pandemic was significant (t=2.40, p=.023). The implication of this finding could be that the significant difference (increase) experienced in the average expenditure of food and non-food items as

well as selected spices (onion, turmeric and Nsukka yellow pepper) were due to the COVID-19 pandemic. This is because households expended on food and non-food items as well as spices regardless of the high prices experienced during the pandemic. The findings of Iheme *et al.* (2020) buttressed that of this study which revealed that 30.8 per cent of the study population consumed local spices such as garlic, onion and ginger for protection against COVID-19.

Table 4
Average expenditure on food items, non-food items and selected spices consumed during and before COVID-19 pandemic

Variable	Average expenditure during COVID-19			Average expenditure before COVID-19		
	Mean	Standard Deviation	Standard Error Mean	Mean	Standard Deviation	Standard Error Mean
Food items	62,776.05	49,305.40	6,261.79	45,953.11	33,194.49	4,215.70
Non-food items	37,839.44	88,436.23	11,231.41	27,758.79	45,159.62	5,735.28
Onion	1,641.51	1,379.76	189.52	1,194.34	1,005.64	138.14
Ginger	511.43	474.28	67.75	471.43	961.55	137.36
Garlic	382.29	375.80	54.24	306.25	404.45	58.38
Turmeric	299.29	376.51	58.10	137.14	168.83	26.05
Black pepper	246.88	292.91	51.78	212.50	251.45	44.45
Alligator pepper	494.64	1,653.86	312.55	339.29	1,176.02	222.25
Nsukka yellow pepper	310.00	429.94	76.00	209.69	260.47	46.04

Table 5
Test of difference between average expenditure on food items, non-food items and selected spices consumed during and before COVID-19 pandemic.

Variables	Mean	Std Deviation	Std error Mean	T value	Df	Sig level
Average household expenditure on food items during COVID -19 versus Average household expenditure on food items before COVID -19 pandemic	447.17	539.71	74.14	6.03	52	.000***
Average household expenditure on non-food items during COVID -19 versus Average household expenditure on non-food items before COVID -19 pandemic	10080.65	45121.80	5730.47	1.76	61	0.084*
Average household expenditure on Onion during COVID-19 versus Average household expenditure on Onion before COVID-19 pandemic	447.17	539.71	74.14	6.03	52	.000***
Average household expenditure on Ginger during COVID-19 versus Average household expenditure on Ginger before COVID-19 pandemic	40.00	913.55	130.51	0.31	48	.761
Average household expenditure on Garlic during COVID-19 versus Average household expenditure on Garlic before COVID-19 pandemic	76.04	465.39	67.17	1.13	47	.263

Average household expenditure on Turmeric during COVID-19 versus Average household expenditure on Turmeric before COVID -19 pandemic	162.14	275.43	42.50	3.82	41	.000***
Average household expenditure on Black pepper during COVID -19 versus Average household expenditure on Black pepper before COVID -19 pandemic	34.38	167.25	29.57	1.16	31	.254
Average household expenditure on Alligator pepper during COVID -19 versus Average household expenditure on Alligator pepper before COVID -19 pandemic	155.36	522.70	98.78	1.57	27	.127
Average household expenditure on Nsukka Yellow pepper during COVID-19 versus Average household expenditure on Nsukka Yellow pepper before COVID-19 pandemic	100.31	236.45	41.80	2.40	27	.023**

****-1% level of significance, **- 5% level of significance, *-10% level of significance***

CONCLUSION

The effect of spices consumption during COVID-19 outbreak was assessed among respondents across Nigeria using online questionnaire. Data collected from 62 respondents and analyzed using descriptive statistics and paired t-test. All the respondents consumed the selected spices; however, most of them consume onion, ginger and garlic. In the same vein, most onion, Nsukka yellow pepper was consumed as additive to food. The study clearly demonstrates a significant difference in expenditure of selected spices (onion, turmeric and Nsukka yellow pepper) during as opposed to before COVID-19. This shows that respondents were aware of nutraceuticals compounds in spices in addition to using them for their primary role of enhancing flavor and appeal in foods. Drawing on the results of this study, awareness of the potentialities of secondary metabolites in spices that yield vast quantities of chemical structures which are the basis for new drugs can aid policy directions in the line of preventive and therapeutic options of the novel disease.

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