

IMPACTS, APPROACHES AND EMERGING NUTRITIONAL AND HEALTH ISSUES OF LOW AND MEDIUM INCOME

EARNERS IN POST COVID-19 ERA: NIGERIA RELATABLE PERSPECTIVES.

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ABSTRACT

There is compelling evidence to the saying that food is healthcare while medicine is sick-care. Hence, making food the medicine saves the torture of making medicine the food. The intertwine between nutrition and health had propelled scientists to several investigations on nutrition in relation to human health over the decades, and the importance of nutritious diet cannot be overemphasized as it is evident that nutritional deficiency or unhealthy diet can lead to one disease or other food inclined health afflictions in human. The COVID-19 pandemic has all the makings of a perfect storm for global malnutrition and health challenges which by implication has damning effect on the nutrition and health status of low and medium income earners (LMIes). An overview of the post COVID-19 challenges to burden LMIes in Nigeria which can subsequently stress their daily dietary intake and by implication, their health is presented with discussions of established and emerging interventions for consideration to a conscious post COVID-19 healthy living. Product inflation, income losses, unstable food supply chain among others are peculiarities of the storm to sway the nutrition and health status of LMIes in the post COVID-19 era. The impacts, approaches and emerging issues to circumvent post COVID-19 afflictions to nutrition and health of LMIes are discussed in this review.

Keywords: inflation, food system, nutrition, health, COVID-19.

INTRODUCTION

Since the declaration of COVID-19 as a global pandemic on 11th March, 2020 by the World Health Organization (WHO, 2020), millions of enterprises had faced existential threat and unprecedented challenges to public health, food systems and man livelihood. The pandemic brought border closure both on the international and local stages, trade restrictions and human confinement, hence preventing access to farms, markets, works and other socio-cultural activities. This led to disruption of the food supply chain and access to diverse diet as well as change in dietary habits. This by implication transcends to the post COVID-

19 era because the experience is a new normal and near restart of the previous normal. Evidently, jobs were lost mostly by those in the private sectors, the food security and nutrition of millions of men and women are under threat with hardest hit on low and medium income earners (LMIes). High working poverty level is inflicted to those low income countries as a result of lack of labour protection and government support. This is subsequently characterized by low and irregular incomes. Needless to say, the focus is shifted to 'eating to survive' rather than 'eating healthy to stay healthy'.

Emerging studies and reports had showed that prior to the COVID-19 wave, there had been nutritional challenges in Nigeria facing different categories of human, ranging from infants to the elderly population. For instance, the report of NNHS (2018) through National Bureau of Statistics in collaboration with UNICEF, USAID and UK aid indicated that children in Nigeria suffer from severe acute malnutrition (SAM). Similarly, women of childbearing age also suffer from acute malnutrition hence, stunting and wasting is prevalence and occur mostly in the northern part of the country. Afolabi *et al.* (2015) affirmed inadequate nutrient intake of the elderly especially in protein and micronutrients as a result of low intake of food of animal origin and fruits. Also, Adebuseye *et al.* (2012) reported under-nutrition prevalence in population who are self supporting financially and lived below the poverty line of \$1 a day. This was corroborated by Alao *et al.* (2015) that poverty is a major contributing element to many of the dietary inclined disorders.

With the existing nutritional challenges coupled with impact of COVID-19 wave, it became more tasking in the post COVID-19 era to implement mitigating measures on the setback caused to human nutrition and health. Academic researchers and food sector experts will face enormous challenges in ensuring food safety and security, identifying alternative safe protein sources that meet nutritional expectations of LMIEs and development of functional foods and nutraceuticals fortified with bioactive compounds and antioxidants that promote health and support immune system (Charis, 2020).

This article while noting the impacts of the COVID-19 wave also explored circumventing interventions to secure nutritious food for LMIEs in Nigeria. The information provided will help every stakeholders familiarize themselves with modalities that can be used to provide healthier diets for LMIEs to improve their nutritional status for a healthy living in the post COVID-19 era.

METHODOLOGY

In this paper, background knowledge of the impacts of COVID-19 with an overview on its implication on food system, economy and human health were highlighted. This was related to the Nigeria perspectives and followed by the specific objective of this work: to assess and present a review of the available research literature examining circumventing interventions that can be used to improve and facilitate the nutritional status of LMIEs in Nigeria by assessing measures of significant importance to minimize financial burden on the budget of low and medium income earners while also ensuring the availability and accessibility of healthy diet

The review was prepared by assessing (through the google search engine) available related literatures, reviewing numerous books, academic journals, conference proceedings, government and non government publications containing topics related to impact, approaches and emerging issues on the economic, nutrition and human health as posed by the wave of COVID-19.

Overview of the Impact of COVID-19 on Health and Nutritional Status of Low and Medium Income Earners (LMIEs)

Before COVID-19, the number of Nigerians living in poverty was expected to increase by about two million, largely due to population growth (The World Bank Publication, 2020). The World Bank report noted that without bold reforms, strong fiscal and monetary policy actions the macroeconomic implications of COVID-19 in 2020 and 2021 will be severe which will include loss of life, and possibility of five million more Nigerians being pushed into poverty. In the finding of Adesoji and Simplice (2020), the COVID-19 had caused negative effect on the macroeconomic variables as inflation was observed and exchange rate affected with subsequent devaluing of the Nigeria currency. This infliction by extension posed negative implication on the food system of LMIEs with ripple effect of decline in both nutrition and health status of people in this category. In the post COVID-19 era, LMIEs purchasing power of healthy diet will reduce due to income losses and inflation. Similarly, the disruption in the food supply chain as a result of COVID-19 is expected to aggravate all form of malnutrition. It is therefore expected that LMIEs will eventually settle for unhealthy diet and adulterated food in a bid to arrest hunger and keep surviving rather than conscious attention to eating nutrient-rich diets that will optimize their health. All these will have exacerbating effect on the health status of LMIEs. Fig. 1 summarized the food system of LMIEs and the challenging consequences to healthy diet and healthy living.

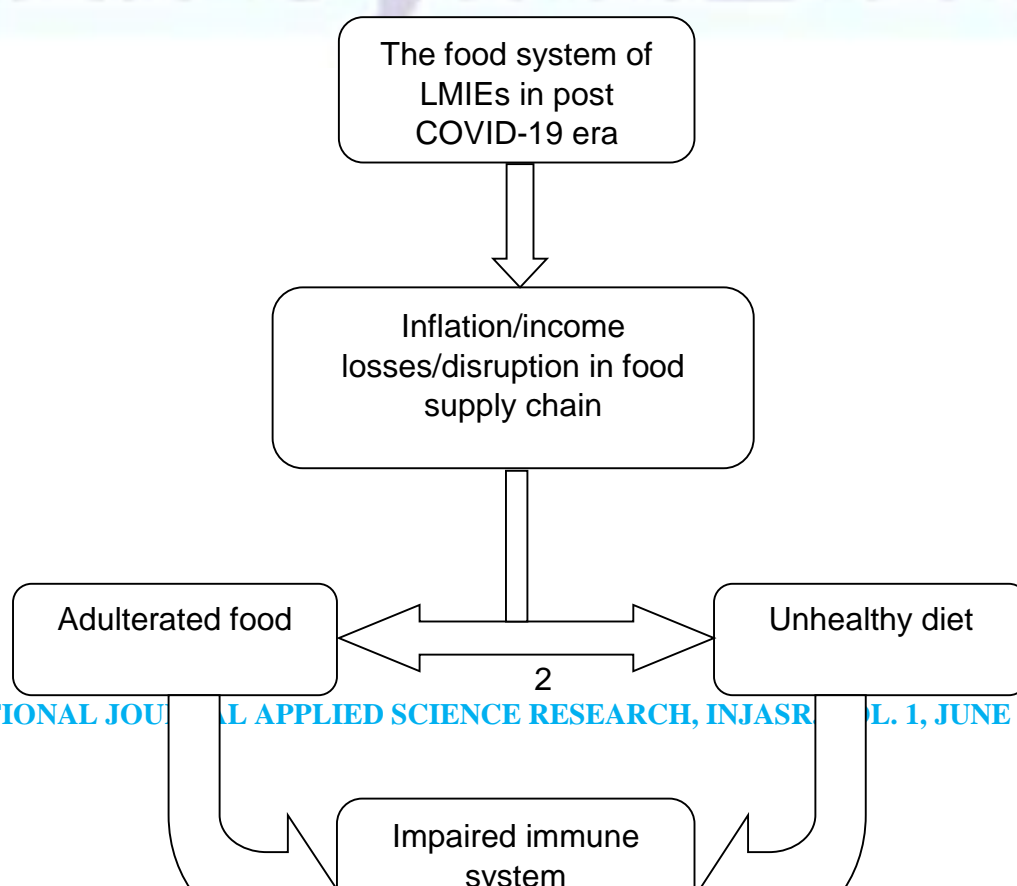


Figure 1. LMIEs food system and challenging consequences to health in post COVID-19 era.

Inflation (increase in the prices of goods and services and decline in the value of money) is the vehicle that brings about food security crisis especially for LMIEs since they have lesser tendency to food availability, food access and food utilization and these have a greater tendency of impairing their health since they cannot build up emergency reserves of food and money but could only depend on market for the majority of their daily food purchases.

Inflation, income losses as well as unstable food supply chain has drastically affected food security which is the ability of all people at all times to have both physical and economic access to sufficient food to meet their dietary needs for productive and healthy lives; food access which is the ability of individuals to obtain available food and of course, food utilization which is the way people's bodies are able to use the food they eat. Income losses coupled with hike in fuel price and electricity bills, value added tax, property and other taxes all at a swoop has worsened the whole scenario. Unstable food supply chain will eventually make food vendors and hawkers to cut corners by adulterating food and using cheaper supplements that are not health friendly.

Recognized challenges associated with inflation, income losses and disruption in food supply chain of LMIES in the post COVID-19 era.

Drastic reduction in dietary quality:

The consumption of functional foods and foods rich in vitamins helps to boost the immune system (Gibson *et al.*, 2012), but most LMIEs cannot afford to incorporate them in their diets for such a time as this, hence they are likely to be more vulnerable and experience impaired health. The importance of vitamins in the body cannot be overlooked. For instance, Vitamin C which plays a protective role as it supports the immune functions and is necessary for the development and repair of all the body tissues (Carr and Maggini, 2017) as well as restricts susceptibility of the lower respiratory tract to infections (Hemila, 1997) while Vitamin A rich foods such as sweet potatoes, carrots, spinach

which comprises of a group of fat-soluble compounds that play essential role in immune function as well as lower susceptibility to infectious disease (Huang *et al.*, 2018) cannot be afforded by this category of people.

The post COVID-19 economic crisis according to Derek and Marie (2020) will affect diets primarily through declining demand in essential micronutrient sources such as vegetables, fruits, and animal-sourced foods. But these demand shock can lead to breakdown in the value chains that supply them. It is noteworthy that majority of these essential micronutrient sources are highly perishable if not used immediately or processed and stored adequately for later use, however, processing and storage will impose additional purchasing cost thereby placing them in the 'out of reach' category for LMIEs. This will further impose exacerbating effects on LMIEs and make them shift to monotonous, nutrient-poor diets.

Loss of jobs as a mitigating measures resulting from COVID-19, coupled with existing widespread unemployment rate prior to COVID-19 and the general disruption in livelihood imposed by COVID-19 will definitely affect the capacity of low and medium income earners in accessing quality food. They will rather go for the cheapest calories with or without nutritive values as long as it sustains them and their families. Suffice to say, the repercussion of drastic decline in income is evident in vulnerable households giving up nutrient-rich food quickly in order to preserve their caloric intake. This happened during the 1998 Indonesian financial crisis, when real wages fell by 33% between August 1997 and August 1998 (Derek and Marie, 2020). People's livelihoods were endangered by fall in economic activities and in this period a quarter of all SMEs were shut down and this resulted to rising unemployment and a food price crisis, for instance, price of rice tripled (Wee, 2002; Derek and Marie, 2020). Strikingly, even as rice prices skyrocketed, rice consumption continued to rise during this period and by this effect, imposing a monotonous diet as food diversification may prove costly to attain.

This was further corroborated by Meerman and Aphane (2012) that shifting from diversified diet rich in micronutrients to one that is derived predominantly from high carbohydrate staples is a common response to declines in income. Thompson (2019) also noted that despite the monotonous feeding habit, not all poor people will be able to maintain caloric intake in the face of economic crisis as they cut back expenditures on other essential items that may jeopardize longer term food security. The consequences are highlighted by Meerman and Aphane (2012) as a compromise in both macro and micronutrient intake thus increasing risk of stunting, micronutrient deficiencies, associated poor health outcomes, impaired immunological function, increased risk of maternal and infant death, impaired eyesight, decline

physical productivity in adults and cognitive as well as physical development in children. All these will compromise human capital and definitely put in motion 'sick-care' because the 'healthcare' aspect which is food (specifically diet-rich nutrition) has been neglected or unaffordable due to economic crisis.

Diets play a vital role to the health status of people around the world and need for healthy diet begins almost immediately after birth. This is why emphasis on child nutrition is important and equally used as important indicator of nutritional status and health in populations (WHO, 2010) because nutritional disorder at childhood can stretch to adulthood if not properly addressed. Malnutrition severely weakens people's immune systems and creates vulnerability to illness and death. Iron, iodine, folate, vitamin A, and zinc deficiencies are widespread occurrence, with over 2 billion people affected worldwide. This "hidden hunger" not only increases the risk of morbidity and mortality, but also contributes to poor growth, intellectual impairment, and perinatal complications (Muhammad and Martien, 2020).

Emerging issues in post COVID-19 era

Rise in food prices to increase nutrition insecurity

The United Nations World Food Programme (2020) has projected a rise in number of people expected to face food crises due to the impact of the COVID-19 unless swift action is employed. This is sufficient enough to say that people can only eat if they earn a wage and eat well if the wage earned is commensurate to cater for nutrient-rich diet alongside other essential items that may be prioritized over nutritious diet. For LMIEs who by all indications will lose their purchasing power and right are at the mercy of poor nutrition and possibly face chronic hunger. Needless to say, their nutrition security is threatened. The nutrient-rich diet will be priced out of their earnings and procuring expensive health benefiting diet will be more tasking. In the same vein, the disruption of the food supply chain from the COVID-19 impact will create price crisis of available food thereby restricting accessibility and possibly retained purchasing power only to the higher income earners. Due to the available information on how unhealthy diets created pre-existing diet-related health conditions (such as diabetes, obesity, heart diseases etc) that exposes patients to suffer more serious consequences from COVID-19 coupled with the awareness of the importance of micronutrients in boosting immune system to help combat viral infections in human as complimentary to clinical procedure to maintain or restore health (Alfredo *et al.*, 2020), there will be competition to be nutritionally secured. According to Muhammad and

Martien (2020), experience from 2008 points to an impending nutrition crisis in the studies carried out in Bangladesh, Cambodia, and Mauritania which assessed the impact of the 2008 global food price crisis, suggesting it increased acute malnutrition by 50% among poor children. Other studies found evidence of a significant rise in stunting among both urban and rural children

Occurrence of Jobs and Income Losses to impose direct result of infections among LMIEs

COVID-19 evidently is a virus that threatened lives, businesses, jobs, economy and the world government at large. At its peak, while the developed countries like USA gave stimulus package to cushion the impact imposed to citizen's productivity and income, developing countries such as Nigeria face a more exacerbating effect due to pre-existing economy instability coupled with COVID-19 shock that threatened most jobs, reduced wage and completely loss of financial capability in some instance. According to Adie (2020) while quoting Nigeria's Minister of Labour and Employment projection of unemployment rate in 2019, reported unemployment rate increase to 33.5% in 2020 (39.4 million people) as against 23.1% in 2018 (20.9 million people). The Ministry of Labour and Employment put the total number of job losses in Nigeria to about 39.5 million (Adesoji and Simplice, 2020) and this will in turn affect nutrition as well as health of the vulnerable. Unemployment and falling incomes of daily wage labourers and industry workers have taken a heavy toll on LMIEs (Thurlow, 2020). Further compounding this is the issue of food pricing and its consequences as noted earlier. Post COVID-19, if these concerns are not properly addressed, LMIEs will be exposed to price spikes and food shortages, while low agricultural productivity and breaks in the food import-export system will disrupt local food markets and small businesses (The World Bank, 2020). The consequences will be brutal to LMIEs nutrition and by implication, support avoidable nutritional disorders and encourage vulnerability to infections other than COVID-19.

Reduced income and limited financial resources will aggravate pre-existing diet related disorders and possibly encourage high prevalence

According to WHO (2021), the prevalence of diabetes for example rose from 108 million between 1980 and 2014 to 422 million with increased prevalence in low and middle-income countries when compared with high-income countries. This record is a testament to the fact that low and middle income earners suffer the most of diet related disorders. This can easily be attributed to their feeding habit consisting mainly of staple foods reinforced with carbohydrates and low in other essential nutrients. Their income is in no doubt part of barrier to healthy nutrition.

An imbalanced diet is regarded as one of the main causes of malnutrition, a denial of sufficient amount of vitamins and/or minerals, protein and fat to maintain a healthy body weight or perform proper bodily functions which extremely compromised immune system (Shahid and Anwar, 2013; Ashagidigbi and Dahunsi, 2018). This is in part worsening by food price and unavailable/inaccessible healthy food. LMIEs will prefer to spend the least Naira on diet low or missing completely in essential micronutrients needed by the body than spend higher to procure diet reinforced with micronutrients for bodily function due to their reduced income/limited financial resources. Malnourished individual are 10 times likely to die of treatable diseases like cold or diarrhea (Shahid and Anwar, 2013) and this is part of the challenges to face LMIEs post COVID-19. For individual already diagnosed with one or more nutritional related disorder, it will be difficult to maintain health with functional and bioactive foods. This situation will encourage the prevalence of nutrition disorder and a relapse in the effort made globally to reduce the incidence of malnutrition.

Approaches to Circumvent Nutritional and Health Challenges Posed by COVID-19 Wave in the Post COVID-19 Era for LMIEs in Nigeria

1. Secure nutritious food at affordable prices for LMIEs

In one of the solutions proffered by Muhammad and Martien (2020) in order to protect people's health during COVID-19 was to secure food at affordable prices mainly for poor communities. Focus must be concentrated to adopt favourable policies to benefit the nutrition pattern of the vulnerable in post COVID-19 era. Attention to international trade must be complemented by steps to keep domestic food production, processing, and marketing functional and safe food and social safety net programs are essential to provide resources for families who have lost the ability to secure nutritious food.

2. Food insecurity interventions

Agricultural sector should be mobilized to drive economic recovery. A range of radical agrarian reforms should be employed to focus on revitalizing institutions for land, livestock, capital, and labour, while shifting land ownership from the state to private households should be considered for mass production of food (Wigle *et al.*, 2020). The significance of this household production was corroborated in the findings of Ahmad and Dotti (2014) with positive relationship between household production enterprise and food security to medium income earners.

Agrarian land reforms focused on shifting land ownership and adopting innovative/efficient agricultural practices which may yield dividends on under-nutrition in the long term, immediate solutions also have value. One of Ethiopia's solutions to food insecurity (i.e., the Productive Safety Net Program) was aimed at providing emergency food aid to 15 million individuals vulnerable to food insecurity and was considered important to the country's stunting-reduction narrative (Tasic *et al.*, 2020). Such long- and short-term solutions addressing both supply and demand-side challenges could be considered for nutrition protection in post COVID-19 era.

3. Collaboration among every stakeholders to ensure the maintenance of better nutrition through experts advice and other interventions

Nutrition stakeholder's participation to improve LMIEs diet plan should be encouraged. Plans for expanding nutrition programme and development of country nutrition specific advocacy campaigns should be made. Better nutrition should be advised and encouraged by nutrition experts and also create awareness of the importance of nutritious diet in boosting people's immune system and lower the risk of diet-related conditions and food borne illnesses. The consumption of fruits and vegetables, whole grains and plant-based protein capable of substituting for food of animal origin which may be expensive for LMIEs should be promoted. Fruits, vegetable and grains offer important vitamins, minerals, fibres and phytochemicals (Aynsley, 2017). These can be secured through kitchen gardens, growing bio-fortified crops, and diversifying food produced for domestic consumption. Cold chains for more perishable nutritious food should be improved, fresh food markets should be upgraded, and food safety should be ensured (Muhammad and Martien, 2020). Breast feeding should be encouraged among women of child bearing age and when breast milk cannot meet the nutritional requirement of the baby, complementary food reinforced with nutrients capable of meeting the baby's requirement for growth should be promoted. Government and community leaders should **support enhanced homestead food production to increase access to nutrient-rich vegetables, fruits, and eggs to improve diet quality** (Derek and Marie, 2020). The use of local food of health importance with minimum financial implication should be encouraged with adequate sensitization. Numerous investigations of local food of significance health benefits are in the public space (Naik *et al.*, 2010). A review of some potential Nigerian local food as source of functional food and their health promoting benefits was carried out by Israel *et al.* (2018).

4. Public spending must be aligned to encourage healthy nutrition

Nutrition bottlenecks to effective spending by LMIEs on nutritious diet must be identified. Food items discussed in the preceding circumventing interventions should be made affordable and accessible to low and medium income earners. Policy frameworks by government to address the financial peculiarities of LMIEs in procuring nutritious diet should be formulated and executed. For example, governments can subsidize healthier foods and mandate adequate labeling on processed foods. Food manufacturing sectors should also be encouraged to prioritize the production of nutritious food at affordable price in a convenient form for LMIEs. Similarly, increase taxation on unhealthy foods and regulation of their marketing and advertising can help promote healthy living by LMIEs (Muhammad and Martien, 2020).

5. Develop innovative ways to motivate LMIEs demand for nutrient-rich foods.

Understanding nutrition definitions and its importance as well as the peculiar challenges of LMIEs are some of the first steps to develop innovative ways to stimulate demand for nutrient-rich food. One of the strategies used by Nigeria Centre for Disease Control (NCDC) during the COVID-19 pandemic was the constant mobile phone messages sent to citizens to help sensitize them on the novel disease and provide update on guidelines to help stay safe. This template can also be copied and use as one of national nutrition policies to stimulate demand for nutrient-rich foods by LMIEs. This was also in line with the opinion of Derek and Marie (2020). The use of the media to promote nutrient-rich diet can also help LMIEs change their reinforced calories, unhealthy and imbalance feeding habit. The nutrition stakeholders should partner with the poor communities to develop nutrition campaign that will help provoke the demand for nutrient-rich foods. As noted earlier, food manufacturers can be incentivized to help develop affordable convenient nutritious diet for LMIEs and this will encourage their purchasing power to continuous demand of nutrient-rich food.

6. Improve and leverage on social safety programs to improve dietary quality

Social protection program is seen by the international communities, regional bodies and national governments as policy tool to address development challenges. According to Holmes and Akinrimisi (2012), Nigeria lagged behind in implementation of social protection policy despite a chapter being committed to social protection in implementation plan of vision 20: 2020. For countries that leverage on social

safety programs to scale up their development, cash transfer strategy to low income people for example have been found useful in improving their purchasing power. This was found to achieve significant improvement in dietary diversity because majority of the transfer was spent on food (Parkinson and Deo, 2019). Food transfers is another strategy to improve dietary quality however, focus should be on bio-fortified (micronutrient-rich) crops (Derek and Marie., 2020).

7. Promote food and nutrition surveillance system of the LMIEs population

This has to be based on regular collection of nutritional data. Data collected will be analyzed to define indicators of present or future change of nutritional status (WHO, 2013). Innovations in phone and web-based surveillance systems offer new tools for timely monitoring of vulnerable populations to improve targeting and program design in a time of unparalleled uncertainty (Derek and Marie, 2020). Element for a successful implementation of the surveillance system must provide technical support to conduct food and nutrition survey of LMIEs and improve the quality and use of collected data to help government formulate, modify and apply nutrition policies in order to promote the wellbeing of LMIEs

Concluding thoughts

COVID-19 has dramatically disrupted the way of life thereby increasing global attention to human wellbeing with increasing focus on the vulnerable such as LMIEs. However, there will be impedance to progress but with bold positive steps to cushion the impact, the world can systematically overcome the afflictions in due time. Scientists had relentlessly delved into studies aimed to assess and deescalate the negative impact of COVID-19. Study of interventions to deescalate the impact of COVID-19 in post COVID-19 era however, remains in its relative infancy and much scientific research needs to be done to identify credible modalities with potential to arrest further damages. With the knowledge currently available, it is understood that LMIEs are at the mercy of nutritional cum health afflictions in the post COVID-19 era and this is largely due to the loss of their purchasing power in accessing healthy diets. This loss of purchasing power by implication resulted from inflation, losses of income and disruptions in the food supply chain among others as impacted by the wave of the COVID-19. With the key nutritional circumventing interventions identified in this paper, it will definitely require every key players input to achieve success. Imperatively, the food scientific, nutrition and dietetics community in collaboration with the government and other drivers of the Nigerian

economy must stay abreast of the expanding problems, familiarize with evidence-based interventions that can facilitate and secure food, make it accessible to all and sundry and nutritious for healthy living in the post COVID-19 era.

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