Poor Dietary Quality is Nigeria's Key Nutrition Problem

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The Triple Burden of Malnutrition

Nigeria faces a growing triple burden of malnutrition. First, chronic childhood undernutrition remains stubbornly high. Nationwide, 36.8% of children under five years were estimated to be stunted in 2018—only slightly down from 40.8% in 2008. This corresponds to an annual average decline of less than 0.4 percentage points over the last decade and was almost exclusively due to a reduction in the prevalence of child stunting in urban areas (Table 1). Second, micronutrient malnutrition, including iron deficiency anemia, is extremely widespread among young children and women of reproductive age. While the prevalence rate of anemia among children under five years slightly declined in rural areas between 2010 and 2018, it substantially increased in urban areas. Third, overweight and obesity among adults has been rising rapidly in both urban and rural areas. Over the last decade, the national prevalence rates of overweight and obesity (the extreme form of overnutrition) among nonpregnant women 15 to 49 years of age increased faster than the rate of child stunting decreased, driving the growth of the triple burden. Obesity significantly increases the risk of diet-related non-communicable diseases (NCDs) such as type-2 diabetes, cardiovascular diseases (like heart attack and stroke), and

Key Findings

- Nigeria faces a growing triple burden of malnutrition.
- Poor dietary quality is the root cause of all forms of malnutrition.
- Poor dietary quality is a universal problem in Nigeria.
- Observed dietary diversification is mainly driven by increased consumption of empty, non-staple calories.
- Agricultural seasonality tends to have limited effects on dietary quality in general.
- Agricultural and related trade policies have an important role to play in improving household diets and reducing the triple burden of malnutrition.
- Policymakers should consider adopting a food system framework for reforming federal and state-level food and nutrition policies.

hypertension. The root cause of all forms of malnutrition is poor dietary quality, while poor water, sanitation, and hygiene (WASH) conditions aggravate malnutrition.

Table 1: Prevalence of different forms of malnutrition in Nigeria

Survey year	Child stunting (%)[1]		Overweight among women (%)[2]		Obesity among women (%)[3]		Survey year	Children with anemia (%)[4]	
	Urban	Rural	Urban	Rural	Urban	Rural		Urban	Rural
1990	40.1	51.3							
2003	31.9	47.3	27.7	16.6	9.6	3.6			
2008	31.3	45.0	30.8	17.0	9.5	4.0	2010	55.2	75.1
2013	26.0	43.2	33.0	18.2	11.4	4.5	2015	65.3	73.5
2018	26.8	44.8	36.4	20.7	14.5	5.8	2018	62.0	72.5

Source: ICF, 2015. The Demographic and Health Survey (DHS) Program STATcompiler: http://www.statcompiler.com. Accessed February 13, 2020.
Note: [1] Percentage of children under five years with a height-for-age z-score below -2. [2] Percentage of non-pregnant women age 15-49 with a body mass index of 25.0 or higher. [3] Percentage of non-pregnant women age 15-49 with a body mass index of 30.0 or higher. [4] Percentage of children under five years with a blood hemoglobin level below 11.0 g/dl.

Dietary Diversification

Along with economic growth and increasing production of staple crops, the per capita availability of calories to the Nigerian population rapidly increased in the late 1980s and early 1990s. This trend exceeded the level of 2,500 kcal/day in 1995 and continued to increase on a flatter trajectory into the 2010s (Figure 1). However, the share of calories from non-staple foods has remained constant, suggesting a lack of food consumption diversification at the national level. The non-staple calorie share in national food availability is considerably lower in Nigeria than the national average across all other developing countries around the world; even though the calorie availability per capita is higher in Nigeria. This high and stable reliance on staple foods for calorie consumption implies a generally weak compliance with Bennett's law among the Nigerian population. The law states that, as economies grow and people's income rise, the share of (cheap) calories from staple foods in relation to total food calories consumed tends to decline (Bennett, 1941); it hence reflects consumers' general desire for a high-quality, diversified diet.

Figure 1: Calorie availability per capita (solid lines) and share of calories from non-staple foods (dashed lines) in Nigeria (black lines) compared to the national average across all other developing countries (gray lines)

Calorie availability (kcal/day)   Non-staple calorie share (%)
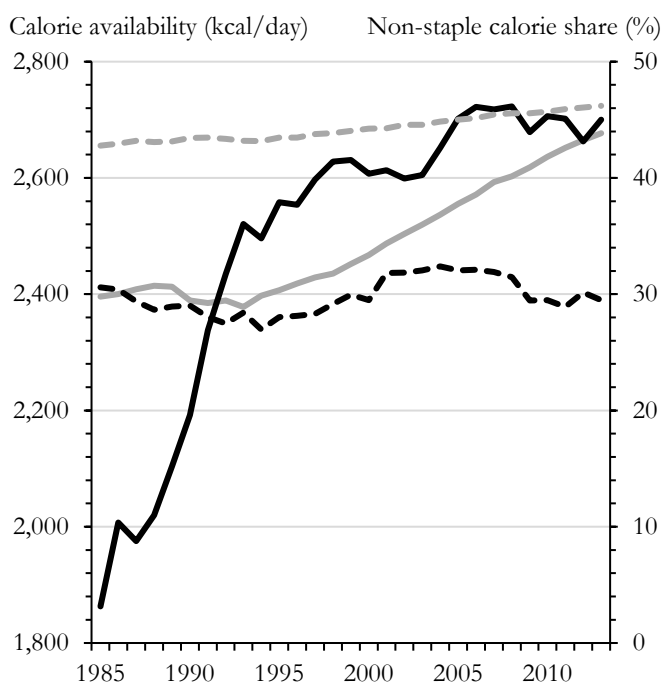
Source: Based on data from the FAO Food Balance Sheets (old methodology): http://www.fao.org/faostat/en/#data/FBSH. Accessed February 13, 2020.
Note: Non-staple foods include all foods except grains, starchy roots and tubers, plantains, alcoholic beverages, and stimulants.

Poor dietary quality is a universal problem in Nigeria: Urban and rural households—across all income quintiles—obtain too many calories from staple foods and far too few calories from vegetables and fruits, pulses, and animal-source foods (including fish, poultry, and eggs; red meat; and dairy products), relative to the optimal calorie intake levels of the "EAT diet" (Figure 2). The EAT diet is a global reference diet recommended by the EAT-*Lancet* Commission that optimizes healthy nutrition and minimizes its environmental footprint (Willett et al. 2019). According to this diet, only about one-third of the daily total calorie intake (34.0%) should be obtained from staple foods (including grains and starchy roots and tubers). Among urban households in Nigeria, the average share of total calories consumed at home which comes from staple foods is 52.5% for the highest income quintile (Q5) and 66.8% for the lowest income quintile (Q1). The calorie consumption shares are even higher among rural households, with 60.0% for the richest quintile and 76.2% for the poorest quintile.

The calories obtained from staple food consumption are similar for the middle-income quintile (Q3) and the highest income quintile, especially in urban areas (Figure 2). In both urban and rural areas, the increase in total calorie consumption across income quintiles is mainly due to increased consumption of the food group "fats and sugars," which also includes sweets, savory snacks, and sugar-sweetened beverages. These patterns suggest that dietary diversification in Nigeria is primarily driven by an increase in the consumption of more expensive (non-staple), "empty" calories rather than diversification into high-value, nutritious foods. The fact that total calorie consumption in rural areas is higher than in urban areas (despite lower rural overweight and obesity rates) can be explained by higher average calorie requirements due to the heavier manual labor common in rural areas.

## Dietary Imbalance and Seasonality

Staple food consumption among urban and rural households exceeds the optimal intake levels set by the EAT diet largely because of overconsumption of starchy roots and tubers (Figure 3). Cassava and yam are Nigeria's main staple crops, in addition to rice, maize, and sorghum. The consumption of pulses, vegetables, and fruits falls far short of the optimal intake levels. The average quantity of vegetables consumed by urban and rural households is less than half of the optimum. Regarding animal-source food consumption, Nigerian households vastly under-consume dairy products—most notably milk. Red meat consumption among both urban and rural households, on average, is low but sufficient according to the EAT diet. The average consumption quantity of fish, poultry, and

eggs together is below the optimal intake level for urban and rural households and mainly consists of fish consumption, which is substantial across Nigeria. The average consumption of fats and sugars and of ultra-processed foods rich in these substances considerably exceeds the optimal intake level in urban and rural areas. In urban areas, it is more than three times that of the optimum.

There is a perception that dietary quality in Nigeria varies considerably between agricultural seasons, as food availability, especially in rural areas, is considered to be subject to the agricultural production cycle (e.g., Ayenew et al., 2018; Maziya-Dixon et al., 2018). Analysis of the Nigeria General Household Survey does not provide strong supportive evidence for this perception. As such, any direct link between food consumption and agricultural production might be weaker than expected: Only around one-third of the food consumed in farm households comes from own-production (in monetary value terms). The mean share of own-produced food in total food consumption was just 29.7% in the 2015-16 post-harvest season and 35.4% in the 2012-13 post-harvest season (and 28.7% and 32.3% in the respective post-planting seasons).

Moreover, patterns of food group consumption for urban and rural households do not show distinct seasonal variations, including for perishable products such as vegetables and fruits (Figure 3). Hence, consumers may substitute foods of the same food group with each other to reduce the effects of seasonal food availability on dietary quality. Consumption estimates for the post-planting season (August – October) and the post-harvest season (February – April) in 2015-16 indicate a small seasonal substitution effect for staple foods among rural households. The mean consumption of roots and tubers was higher in the post-harvest season than in the post-planting season, whereas the consumption of grains, which can be better stored, was higher in the post-planting season than in the post-harvest season. Total calorie consumption per adult equivalent was similar in the 2015-16 post-planting and post-harvest seasons among both rural households (2,907 kcal/day and 2,990 kcal/day, respectively) and urban households (2,666 kcal/day and 2,589 kcal/day, respectively), with a difference of less than 3%. The drop in staple food consumption in the 2012-13 post-harvest season can be largely explained by ripple effects of a decline in Nigeria's oil revenues and the associated slowdown in GDP growth (Ecker & Hatzenbuehler, 2020).

Figure 2: Calorie consumption per adult equivalent among urban and rural households by income quintile, compared to the optimal calorie intake of the EAT diet
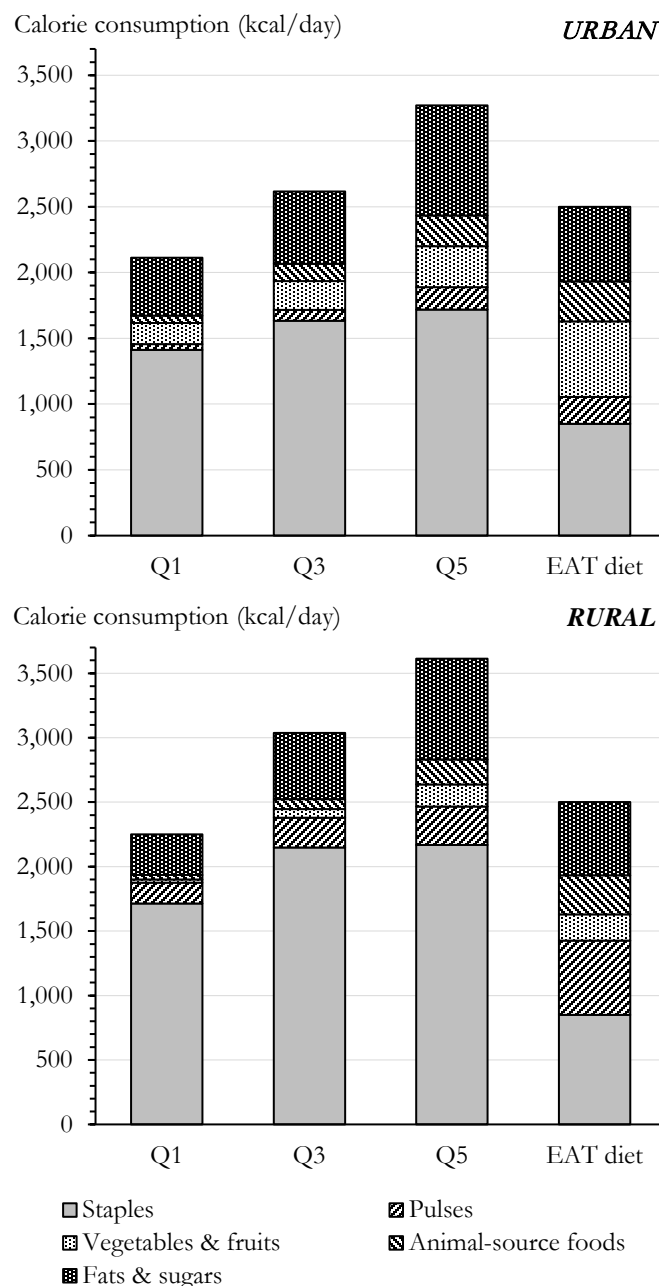
Source: Based on data from the Nigeria General Household Survey – Panel, Year 3 (2015-16): Balanced household samples (N_{urban} = 1,128, N_{rural} = 2,690).
Note: Calorie consumption is averaged across the post-planting and post-harvest survey observations and reported as unweighted averages. The calculation considers only food consumed at home. It does not account for food waste within the household and therefore may overestimate calorie intake, especially among richer households. The EAT diet is designed for a total calorie intake of 2,500 kcal/day.

Policy Implications

Six important policy implications emerge from the findings of this analysis. First, the rapidly growing triple burden of malnutrition in Nigeria and its health and economic impacts deserve more attention from federal and state policymakers, program implementers, and international development partners. In addition to the findings detailed in this analysis, the recent global COVID-19 pandemic is likely to reduce household incomes in Nigeria and further exacerbate the triple burden (Headey & Ruel, 2020).

Second, interventions should emphatically focus on improving people's diet, rather than focusing on the physical outcomes of malnutrition such as reducing child stunting. Improving household access to, and the intake of, high-quality diets—that is, tackling the leading cause of malnutrition—has multiple beneficial health and development effects beyond physical outcomes across different sex and age groups. These benefits include improved immune functions and cognitive skills that are becoming increasingly important for overall labor productivity in developing societies.

Third, to reduce malnutrition substantially and sustainably, nutrition-sensitive policies and programs that address the underlying determinants of malnutrition—including poverty, food insecurity, and lack of access to the components of healthy diets and to adequate WASH services—are needed. Nutrition-specific interventions (such as micronutrient supplementation, food fortification, breastfeeding promotion, and therapeutic feeding programs) make important contributions to improved nutrition. However, these often are limited in achieving large-scale and lasting impact. It is estimated that scaling up 10 effective nutrition-specific interventions will reduce child stunting by only 20% in developing countries, including Nigeria, in which are found 90% of the world's stunted children (Bhutta et al., 2013).

Fourth, nutrition-sensitive agricultural programs (such as promoting integrated homestead food production systems, home vegetable gardens, small-scale livestock production, and aquaculture and biofortification of staple crops and legumes) are particularly promising. These have been shown to positively impact several underlying determinants of malnutrition (Ruel et al., 2018). However, the evidence of the impact of these programs on nutrition outcomes is inconclusive, and, except for biofortification, the scalability of the interventions is questionable.

Fifth, agricultural and related trade policies have an important role to play in improving household diets and reducing the triple burden of malnutrition in Nigeria.

Figure 3: Food group consumption per adult equivalent among urban and rural households by survey round and agricultural season, compared to the optimal calorie intake of the EAT diet
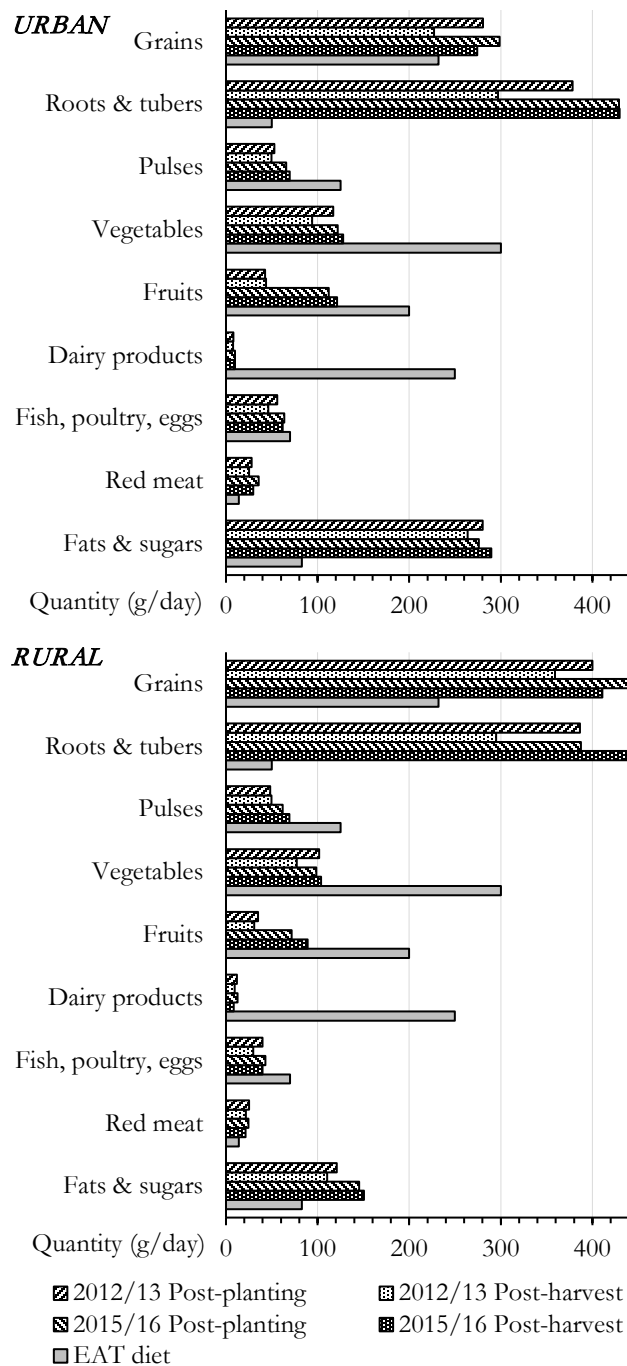
Source: Based on data from the Nigeria General Household Survey – Panel, Year 2 (2012-13) and Year 3 (2015-16): Balanced household samples (N_{urban} = 1,128, N_{rural} = 2,690).

Note: Food group consumption is averaged across the sample population and reported as unweighted averages. The calculation considers only food consumed at home and does not account for food waste within the household. The EAT diet is designed for a total calorie intake of 2,500 kcal/day. The food group "fats and sugars" excludes beverages here.

Agriculture accounted for 36.4% of total employment (in 2019) and is the main livelihood source of the rural poor. More than 90% of the food consumed in Nigeria is produced domestically (FAOSTAT, 2020), but the country also imports food worth between USD 3 billion and 5 billion annually, especially wheat, rice, fish, and milk (FMARD, 2016). Yet, it also bans imports of beef, pork, poultry, and eggs. Agricultural and trade policies influence food availability, farm incomes, and (relative) food prices by defining the regulatory framework, setting production incentives, subsidizing/taxing production, and restricting food imports and agricultural inputs, among other levers. Assessing the dietary effects of these policies, and finding the right policy mix, requires further research.

Sixth, policymakers should consider adopting a food system framework for reforming national food and nutrition policies—as should donors and researchers who aim at supporting evidence-based policy making. The food system goes beyond agricultural production and includes three other main components: food trade and transport, food processing, and food retailing and services (IFPRI, 2018). The characteristics of all four components shape consumers' food environments, and sectoral policies directly influence consumers' diets. As economies grow, the "off-farm" components become more important in terms of value added and total workforce and eventually come to dominate national food systems. In Nigeria, the food system accounted for 33.8% of the national GDP in 2017, with agriculture (including the production of all crops and livestock, fishery, and forestry) accounting for 21.9% (Thurlow, 2020). The off-farm components that comprise the economic activities in upstream and downstream sectors directly linked to food production added 6.2% in trade and transport, 4.2% in processing, and a combined 1.5% in other sectors. Moreover, the rapid rise of food (ultra-)processing and "modern" retailing (such as supermarkets and kiosks) occurring throughout the developing world—including Nigeria—could potentially further aggravate the triple burden of malnutrition and increase the risk of diet-related NCDs (Monteiro et al., 2013; Popkin et al., 2020).

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