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ANALYSIS OF EXPENDITURE PATH BEYOND STAPLE FOODS CONSUMPTION IN NIGERIA

Purpose. *This study investigates the food expenditure path segmented by staples and non-staples in Nigeria.*

Methodology / approach. *A multi-stage sampling procedure was used to sample a cross sectional data of 438 urban households from two randomly selected urbanising states in South West, Nigeria. The study used descriptive statistics such as percentages and means to determine households' food budget shares and their per capita food expenditure*

Results. *From the expenditure estimates, a differential effect in budget share of food was found with an increase in staples diet of Low Urban Area (LUA) households (33 %). However, consumption of non-staple foods was more pronounced among households residing in high urban areas (HUA) (35 %). Per capita food expenditure was higher for LUA households (₦1377.52), while their food shares for processed cereals were equal with those of HUA. Findings suggest a more diverse diets, thus revealing a quality-quantity nexus within urban locations.*

Originality / scientific novelty. *This is the very study that explains urban differential beyond staple food consumption and nutritional outcome. The household food expenditure pattern brought to fore location-specific variations in urban diet in the study area.*

Practical value / implications. *The switch away from consumption of staples was beyond income responsiveness, but, towards changes in level of urbanization. The differential path in per capita expenditures on staple and non-staples are shown to have implications on nutrition within urban areas.*

Key words: *Food expenditure, Urban households, Budget share, Nutrition.*

Introduction and review of literature. Globally dietary patterns are changing as a result of socioeconomic, population growth, rapid urbanization, increased disposable incomes of households and improved food distribution (Drewnowski and Poulain, 2018). Aggregate growth in food expenditure as a result of these drivers is expected to influence the food system and welfare outcome (Zhou and Staaz, 2016). Increased rural-urban migration of people into cities for better livelihoods, often with relatively sedentary occupations with trade and investment liberalization influences the food landscape (Godfray et al., 2010). However, the resultant effect of these changes often brings about a gradual shift in food structure, dietary patterns and nutritional status that vary with the socioeconomic strata. Cockx et al., (2017) identifies urbanization as one of the driving forces behind the nutrition transition which often sharpen dietary patterns. In recent times, traditional diets built around staple starchy crops, such as cassava or rice, are gradually being replaced by more varied diets containing more animal products, more vegetables and fruit, and more processed foods (Drewnowski and Poulain, 2018). However, nutritional knowledge

on dietary diversification, food safety and quality are transforming the path of food expenditure. Leppman (1999) notes household expenditure as a valid measure of food composition which is a reflection of standard of living. Therefore, change in dietary preferences can be understood through household food expenditure pattern. Due to an increase in income, diets contain more animal source foods and fewer staples, even as the proportion of income used to purchase food declines.

Consequent on expected growth in urban population, demand for food will rise substantially with a subsequent shift in composition of food. Nigeria, faces a high rate of population growth, with total population of about 200 million with its urban population growing at 4.75 % per annum (United Nations, 2019). As the nation is the most populous country in Africa with its rapid urbanization and rising per capita income within urban areas, analysis of food expenditure pattern and its implication on nutrition is essential. Poor information and coordination of food expenditure estimates from disaggregated urban consumption patterns might hinder effective integration of food policies and nutritional status of the population. Over time, poor understanding of the changing consumption patterns has resulted in disjunction between food policies and changes in food preferences. In Nigeria, several government policies for self-sufficiency in production and attaining food security have been implemented. Some of these agricultural policy instruments included the Presidential Initiatives Campaign on Cocoa, Cassava, and other food crops (1999–2007); FADAMA projects (2008) at its various stages and Agricultural Transformation Agenda (ATA) of 2012, designed to improve farmers' income and food security and to transform the export opportunities of local food market (Obayelu and Obayelu, 2014). Also, the Agricultural Promotion Policy (APP) of 2015, was designed to resolve food shortages and improve output quality of food produce (Federal Ministry of Agriculture and Rural Development, 2016). The low response from such policies by actors along food value chains could be attributed to poor alignment of food expenditure signals with food policies. Coupled with this is the disparities in emergence of dual burden of malnutrition among households in the context of changing global nutrition landscape. In some cases, over-nutrition (obesity) is often prevalent among the high-income, while the low income is vulnerable to undernourishment (World Health Organisation, WHO, 2018; Hansen 2018). Thus, consumption patterns at the disaggregated level would provide better information as aggregation might not explain relative shift in consumption patterns.

Several studies note changing food preferences, away from staples and towards high value commodities (Tripathi and Srivastava, 2011; Haggblade et al. 2017; Ndubueze-Ogaraku, 2016; Cheng and Larochelle, 2016; Hoang, 2018; Chisanga and Zulu-Mbata, 2018). Literature have provided evidence of rural-urban locational differences in food consumption patterns, but rarely discussed the disparities in food expenditure segmented by staples and non-staples within urban areas (Ashagidigbi et al., 2012). At country level, Cheng and Larochelle, (2016) examined demand elasticities for food staples in Niger and Nigeria. Results showed that poor households allocated a larger share of their food budget to staples and become less

responsive to income change as economic status improves. Haggblade et al. (2017) assessed food security implication of staple food substitution in Sahelian West Africa. From both rural and urban locations, the poor are more likely than the non-poor to devote additional income to food (Engel's law). In response to price changes, the poor are also more sensitive than the non-poor. On the other hand, Humphries et al. (2014) estimated differential responsiveness of animal source food consumption to changes in total household expenditures. Households with lower total expenditures spent greater proportion of expenditures on food but with lower percentages on animal source foods.

Analysis of household consumption expenditure on selected staple foods was investigated by Ndubueze-Ogaraku et al. (2016) in Nigeria. The study concluded that the estimated average household expenditure on meat was the highest followed by rice, yam and beans, while expenditure on garri and plantain were low. Jovanović (2016) analysed the impact of income and its changes on the structure of consumption expenditure by certain groups of products and in different areas in Montenegro. From the results, the structure of food consumption for the urban residents on the share of meat and fruit decreases, whereas vegetables, milk, cheese and eggs increased. Obayelu et al. (2011) analysed the differential in households' food expenditure between urban and rural households in North-central, Nigeria. Results revealed that households in the rural areas spend over half of their expenditure on food compared to the urban. Also, expenditure on food decreased with household per capita income which was in line with Engel law, while expenditure on staple food items was highest in both rural and urban areas.

This study used a cross-sectional data from 438 households randomly selected through a multi-stage sampling procedure from two randomly selected urbanising states in South West, Nigeria. South west zone is noted for its rapid level of urbanization owing to high concentration of urban activities (Ikwuyatum, 2016). The two states namely Ekiti and Oyo are representative of low urbanised areas (LUA) and high urbanized areas (HUA), respectively. The criteria for grouping was based on their level of urbanisation, population size and density as well as other administrative activities (Ikwuyatum, 2016, National Population Commission, NPC, 2006). These criteria have been identified as a crucial factor sharpening urban food demand (Seto and Ramakkutty, 2016), therefore making the study areas suitable for the research. Information were collected on socioeconomic variables and records of the expenditure of foods purchased by the households on a one-week period.

Changing dietary patterns often associated with the nutrition transition, can be linked to two classic laws of economics (Drewonski and Poulain, 2018). The two laws related to changing food consumer preferences are Bennetts law and Engel's Law. These laws describe the budget shares of food differently. However, Bennett's law, states that the ratio of starchy staple foods consumed decreases when income increases (Bennett, 1941). It implies that the proportion of calories a household derives from the basic starchy staples (mostly grains and root crops) falls with rising income. Engel's law describes the budget share of (total) food as a declining linear

function of the logarithm of total consumption expenditure (Engel, 1895). This means poorer households devote a higher share of income to food than richer households (Holcomb et al., 1995). Several versions of Engels law have been used in literature as they relate to food, rent, sundries and so on. However, it validates the principles of distribution of expenditures under conditions of increasing or decreasing income. Specifically, the poorer is a family, the greater is the proportion of the total expenditure which must be allocated for food for maintenance of physical sustenance. The proportion of the outgo used for food, other things being equal, measures the standard of living of a population. In other words, Engel, upholds the state of rising income when food expenditures increased at an arithmetical rate. (Zimmerman, 1932).

Following Theil et al. (1987), let *Yi* be the total consumption expenditure in household *i*, and W_{TFi}, the per capita budget share of total food for household *i*. By Working's (1943) model, it is predicted that W_{TFi} is a declining linear function of the logarithm of *Yi*, given as;

$$W_{TFi} = \alpha_i + \beta_i log\ Y_i + \varepsilon_i \qquad (1)$$

where β is the slope and ε_i is a random error term. If total food is subdivided into staple and non-staple, then W_{si} and W_{nsi} represent the per capita budget shares of staple and non-staple foods, respectively, for household i. Therefore, the logarithm of the ratio of the expenditures on these foods, is a linear function of log Y*i* which is expressed as:

$$Log\ W_{si}/W_{nsi} = \gamma_i + \delta_i log\ Y_i + e_i \qquad (2)$$

Clement and Si, (2018) explain a broader implication of Engel's law based on the food expenditure pattern. As food occupies a larger share of the poor's budget, there is tendency of less diversity relative to more affluent consumers, therefore, they are regarded as food-intensive. Specifically, within their food budget, cheaper, more-starchy foods (such as rice, potatoes, and bread) are likely to be predominant for the poor, leading to less nutritious, less diversified diets (Li, 2011; Chai and Moneta, 2012; Khoury, et al. 2014; Chai, et al., 2015). Another perspective of this law is its relationship with quality. With luxuries food share taking a greater proportion of the affluence, such that an additional income is spent on these goods suggest they are preferred, or of higher quality. This approach to the measurement of quality has been studied by Theil (1976) and extended by Clements and Gao (2012).

The study used descriptive statistics such as percentages and means to assess food shares. Total food was defined as the summation of staple and non-staple foods. Weekly food expenditure for staples and non-staples was generated by summing all the respective food items in each food group. Further, weekly budget shares for food were generated by dividing food expenditures (total food, staple, and non-staple) by weekly household head income, which was generated by dividing monthly household income by 4. Per capita expenditure on food was the percentage share of total food, staples and non-staples group relative to the number of household members.

The food items included in the study are rice, wheat, processed cereals, plantain, garri, yam, pulses, milk and milk products, meat, fish, and eggs, vegetables and fresh

fruits. However, grouping of food items by their nutritional contents often provide clear understanding on their caloric shares. Following Tripathi and Srivastava, (2011), food items were classified as staple and non-staple foods based on nutrient capabilities. The staples foods derived from cereals and root crops included rice, wheat, processed cereals, plantain, garri, yam whereas the non-staples group included all other food items (pulses, milk and milk products, meat, fish, and eggs, vegetables and fresh fruits) which is regarded as high value foods. Food expenditures were further disaggregated into eight groups: meat (beef, pork, chicken, fish), dairy (cheese, milk), fruits and vegetables (fresh fruits and vegetables), wheat (unprocessed wheat meal), processed cereals (bread, pasta, semovita), pulses (beans, legumes), other cereals (yam, plantain, cassava products) and rice (milled, parboiled). Expenditure share for the disaggregated food items were calculated to know their relative weights in weekly income.

The purpose of the article. Due to diversity in food habits, empirical understanding of urban heterogeneity in food consumption is important considering different social status and location variation within urban locations. The aim of this study is to assess the expenditure pattern of staple and non-staple foods among urban households in Southwest, Nigeria. Specifically, the study determines the relative food budget shares and the per capita food expenditures of the households on staple and non-staple foods. This study fills the gap by examining expenditure differential beyond staples consumption within two urban locations in Nigeria. Disaggregation of commodity-specific food expenditure by place of residence would likely impact policy changes on agrofood transformation and welfare outcome. Such information is particularly crucial for Nigeria with its drive for improvement in food security and challenges of rising diet-related diseases in urban areas.

Results and discussion. Summary statistics of household heads and the mean values of food expenditure across the two urban areas are presented in Table 1. Result revealed that majority of the household heads were male with a higher percentage in HUA (70 %). There was no significant difference with respect to age of household heads across the two locations (about 47 years). About three quarters of household heads had tertiary education but more prevalent in high urban households (81.0 %). Income per week for residents in LUA (₦16633.08) was lower compared to HUA. Mean value for household size in LUA averaged at 5 persons. Findings suggest that household food consumption pattern in the urban centres considered are likely to be affected by different socioeconomic characteristics. With respect to food expenditure estimates (Table 1), residents in low urban area expended more money on staples (₦4510.18) compared to households in HUA. Increase in intake of food sourced from grains and roots and tubers might be linked to its availability and often price insensitive nature. The decrease in staples intake among households in HUA confirms the Bennett's law which states that the caloric ratio of starchy staples (grains and root crops) falls with rising income. This implies that residents in urbanized areas often consume less calories in comparison to residents in low urban areas, probably because of sedentary nature of urban lifestyles. However, an increase

in expenditure on non-staple foods was observed among HUA households (₦6336.50) relative to LUA. Findings corroborated Drewnowski and Poulain, (2018) in that urban diets are more varied been linked to less dietary energy. Changing socioeconomic position, reduced physical activities and concern for food quality might be responsible for this shift.

Table 1

Summary Statistics of Household Characteristics and Mean Food Expenditure

Variables	LUA (N=156)		HUA (N=282)		FULL SAMPLE (N=438)	
	MEAN	SD	MEAN	SD	MEAN	SD
Demographics						
Sex (1= male)	0.67	0.47	0.70	0.46	0.67	0.45
Age of household head (in years)	47.25	9.60	47.53	10.55	47.28	10.78
Household size (numbers)	4.70	1.59	4.29	1.53	4.51	1.56
Educational status (1=formal)	0.77	0.42	0.81	0.40	0.79	0.41
Income/week in Naira	16633.08	5798.48	17951.63	5850.85	17482.01	5859.81
Weekly food expenditure(₦)						
Staple	4510.18	2323.46	3511.10	1577.49	4199.47	2065.97
Non-staple	5298.14	2603.58	6336.50	3087.89	5966.67	2963.67
Total food	10808.32	4613.83	9847.60	4440.86	10466.14	4571.14

Source: field survey, 2018.

The food budget shares describe the percentage of money allotted to food and the two food groupings. The budget share as presented in Table 2 revealed a differential effect in share of staples across the two locations. There was a reduction in staples (20 %) and total food shares (55 %) among households in HUA. This finding suggests a sizeable diversity in food composition within urban households been modified by the level of income (total expenditure) and quest for diverse diets. Also, the staple index in HUA (20 %) was lower than LUA (33 %) which suggests that Bennett's law was substantiated. Within the LUA household's food budget share, over half (65 %) of household's total expenditure was devoted to food. This was in line with the explanation of Engle's law which states that a greater proportion of expenditure goes to food as income improves (Engel, 1857). Chakrabarty and Hildenbrand (2009) and Gao (2012) also provided the validity of Engel's law. This finding agrees with Clement and Si, (2018) that the poor might spend as much as one-half of their income on food, so their budgets can be said to be food-intensive, or specialized. In addition, the likely increase in cheaper, starchy staple foods (33 %) relative to HUA (20 %) might lead to monotonous diets often with less nutritious and diversified food intake as reported by Clement and Si (2018). Conversely, the higher percentage of budget shares of high value foods in HUA (35 %) suggests preference for foods with higher nutritional quality. This buttress the fact that changing socioeconomic status and often occupational activities in most urban areas might be responsible for this. This luxury attributes, therefore, implies that the overall quality of consumption was location-specific. This aligns with previous studies which reported that the declining staple food share that accompanies income growth tends to quality in food consumption (Ashagidigbi et al, 2012; Clements and Si, 2018).

The levels of per capita non-staples consumption are, in general, higher in urban areas. The better-off urban consumers tend to have a high level of per capita consumption towards nutritious foods (₦1626.11) as established in this study (Table 2). Such trend towards the preference for non-staples explains the lower level of consumption of starchy staples in urban Nigeria. This might probably be as a result of increase in dietary knowledge towards quality and nutritional capabilities of food consumed. In addition, the demand for higher utility through diverse diet for quality sets in as income rises, when basic food requirements have been met. Considering urban disparities, it is expected that there would be likely variation in per capita food expenditure by place of residence. The LUA per capita for staple (₦1377.52) was relatively higher which suggests a greater proportion of income is spent on staple foods which are often inexpensive and rich in calorie to meet basic food requirements with an additional household member. This corroborates Obayelu et al. (2011) who reported expenditure on food to have increased with number of household members, while money expended on staple food items was the highest in both rural and urban areas Nigeria.

Table 2

Estimates of Weekly Food Budget Share and Per Capita Expenditure

Variables	LUA (N=156)		HUA (N=282)		FULL SAMPLE (N=438)	
	MEAN	SD	MEAN	SD	MEAN	SD
Food budget share (%)						
Staple	0.3313	0.09	0.1956	0.08	0.2364	0.09
Non-staple	0.3171	0.10	0.3518	0.11	0.3394	0.11
Total food	0.6484	0.15	0.5475	0.14	0.5958	0.15
Per capita food expenditure(₦)						
Staple	1377.52	1349.20	1120.59	816.87	1212.10	1043.99
Non-staple	1576.53	1478.51	1626.11	1326.76	1608.45	1381.23
Total food	2954.05	2741.52	2746.70	2053.02	2820.55	2320.77

Source: field survey, 2018.

With reference to the disaggregated food items result reported in Table 3, the contrast in food preferences away from cereals and other staples towards animal source foods and fruits and vegetables also raises some concern on their nutritional implications. With the rise in disposable income and urban population growth, this trend might not be limited to diversification of diets but reduction in per calorie intake coupled with non-communicable diseases (NCDs) resulting from differentiated diets. The challenge of this trend should be anticipated in view of increase in diet-related diseases, such as overweight, obesity, hypertension, cancer and diabetes mellitus, which is now prevalent in most urban cities in Nigeria (Ekpenyong and Akpan, 2013; Awosan, Ibrahim, Essien, Yusuf, and Okolo, 2014; Olawuyi and Adeoye, 2018). In addition to health effect, most livestock products are often price sensitive which might be too expensive for less urbanised and low income household to access. This is a constraint to households' means of accessing sufficient food quantity and adequate food quality which has been identified as a critical challenge in developing countries (Ruel et al., 2017). In Table 3, expenditure level across food

items suggest variation in caloric share of food within urban areas. On the aggregate, meat had the highest share, but more pronounced in HUA (24 %). This implies that about 24 % of total food expenditure is spent on meat and its products. Previous study in Nigeria by Ndubueze-Ogaraku et al. (2016) reported that meat and its product had the highest average household expenditure. However, this finding was different from Jovanović (2016) who reported a decline in the structure of meat and fruit consumption for the urban residents. Meanwhile, money expended on intake of fruit and vegetables was higher in HUA (10.3 %). This might be the health implication of their consumption as source of vitamins and minerals.

Notwithstanding, the gradual shift away from staples to non-staples as shown in table 3, revealed that rice and other cereals (yam, plantain, cassava products etc.) provided about 29 % of the total caloric intake of households. Although, Cheng and Larocelle (2016) confirmed the relatively larger share of rice in Nigerian diet, this paper observed caloric differences between LUA (14.8 %) and HUA (12.1 %). Tripathi and Srivastava (2011) also supported that the caloric share of rice in rural areas exceeded that of urban areas. Despite, the shift away from domestically produced staples, roots and tubers accounted for about 16 % of the food budget shares in the aggregate where LUA had the largest share (15.1 %). Pulse, a good source of protein was a percentage higher for households in LU areas than residents in HUA. This contrast the findings of Cheng and Larochelle, (2016) who reported large share on legumes in Nigeria which might be as a result of country-specific without disaggregation effect across locations. It is interesting to know that share of processed foods within the two locations were almost equal (0.08). Within non-staple food items, dairy products, and pulses have marginal differences within each location. This indicates that as non-staples foods become more diversified, with the higher demand for meat products, their implication on health and production should be anticipated considering high rates of obesity in Nigeria. This implies urban areas are liable to different categories of malnutrition.

Table 3

Estimates of Food Expenditure for Disaggregated Food Items across Urban Locations

Variables	LUA (N = 156)		HUA (N = 282)		FULL SAMPLE (N = 438)	
	MEAN	SD	MEAN	SD	MEAN	SD
Rice	0.1476	0.11	0.1210	0.07	0.1305	0.08
Wheat	0.0632	0.04	0.0455	0.03	0.0524	0.04
Other cereals	0.1609	0.08	0.1511	0.11	0.1574	0.09
Processed cereals	0.0773	0.09	0.0796	0.06	0.0788	0.07
Pulses	0.0592	0.04	0.0482	0.03	0.0518	0.04
Meat	0.2239	0.20	0.2457	0.11	0.2380	0.15
Fruits and vegetable	0.0830	0.09	0.1033	0.06	0.0960	0.07
Dairy	0.0265	0.03	0.0272	0.03	0.0270	0.03

Source: field survey, 2018.

At one point, subpopulation is undernourished, while at another, they are said to

experience over nutrition and other NCDs. These findings are useful in devising effective nutrient-enhancing strategies for diversified consumption basket.

Conclusions. The growing and changing evidence on food expenditure estimates provides a greater opportunity for understanding disparities in food consumption patterns. Food occupies the major share of household total consumption expenditures, especially in LUA. The switch away from consumption of staples is beyond income responsiveness, but, towards changes in level of urbanization. This was established in differential path of staple and non-staple per capita consumption, which revealed varying food expenditure levels across urban areas. This is indicative of the more varied diets in consumption choice, especially among urban households. These demand patterns also provide information that guides policy-makers in the formulation of food and nutrition policies.

The existing evidence is capable of identifying which food commodities can bring larger nutritional outcome to vulnerable groups. Thus, the study recommends that strategies towards location specific disparities in food consumption could be checked. This could be achieved through strengthening of the agrofood structure through policies on research and development and infrastructural transformation by relevant stakeholders (government, private sector etc.). Therefore, policy interventions in bridging rural-urban food linkages will help in addressing the issue of malnutrition as a result of monotonous diets. This will also improve availability and accessibility of high value foods (mostly perishables) needed for increased micronutrient consumption.

References

1. Ashagidigbi, W. M., Yusuf, S. A. and Okoruwa, V. O. (2012), Determinants of Households' Food Demand in Nigeria. *World Rural Observations*, vol. 4, is. 4, pp. 17–28.

2. Awosan, K. J., Ibrahim, M. T. O., Essien, E., Yusuf, A. A. and Okolo, A. C. (2014), Dietary pattern, lifestyle, nutrition status and prevalence of hypertension among traders in Sokoto Central market, Sokoto, Nigeria. *International Journal of Nutrition and Metabolism*, vol. 6, is. 1, pp. 9–17. https://doi.org/10.5897/IJNAM2013.0158.

3. Bennett, M. K. (1941), Wheat in national diets. *Wheat Studies of the Food Research Institute*, vol. 18, is. 2, pp. 37–76.

4. Chai, A. and Moneta, A. (2012), Back to Engel? Some Evidence for the Hierarchy of Needs. *Journal of Evolutionary Economics*, vol. 22, is. 4, pp. 649–676.

5. Chai, A., Rohde, N. and Silber, J. (2015), Measuring the Diversity of Household Spending Patterns. *Journal of Economic Surveys*, vol. 29, is. 3, pp. 423–40. https://doi.org/10.1111/joes.12066.

6. Chakrabarty, M. and Hildenbrand, W. (2009), Engel's Law Reconsidered. Working paper, Indian Institute of Management, Calcutta, India. https://doi.org/10.1016/j.jmateco.2011.01.006.

7. Cheng, Z., and Larochelle, C. (2016), Estimating household demand for millet and sorghum in Niger and Nigeria. Socioeconomics Discussion. Paper No. 39.

International Crops Research Institute for the Semi-Arid Tropics.

8. Chisanga, B. and Zulu-Mbata, O. (2018), The changing food expenditure patterns and trends in Zambia: Implications for agricultural policies. *Food Security*, vol. 10, is. 3, pp. 721–740. https://doi.org/10.1007/s12571-018-0810-7.

9. Clements, K. W. and Gao, G. (2012), Quality, Quantity, Spending and Prices. *European Economic Review*, vol. 56, is. 7, pp. 1376–1391. https://doi.org/10.1016/j.euroecorev.2012.06.006.

10. Clements, K. W. and Si, J. (2018), Engel's Law, Diet Diversity, and the Quality of Food Consumption. *American Journal of Agricultural Economics*, vol. 100, is. 1, pp. 1–22. https://doi.org/10.1093/ajae/aax053.

11. Cockx, L., Colen, L. and De Weerdt, J. (2017), From corn to popcorn? urbanisation and food consumption in Sub-Saharan Africa: Evidence from rural-urban migrants in Tanzania. LICOS Discussion Paper Series, Discussion Paper 390/2017. https://doi.org/10.22004/ag.econ.249270.

12. Drewnowski, A. and Poulain, J. (2018), What Lies Behind the Transition from Plant-Based to Animal Protein? *AMA Journal of Ethics*, vol. 20, is. 10, pp. E987–993. https://doi.org/10.1001/amajethics.2018.987.

13. Ekpenyong, C. E., and Akpan, E. E. (2013), Urbanisation drift and obesity epidemic in sub-Saharan Africa: A review of the situation in Nigeria. *European Journal of Sustainable Development*, vol. 2, no. 2, pp. 141–164. https://doi.org/10.14207/ejsd.2013.v2n2p141.

14. Engel, E. (1857), *Die Productions- und Consumptionsverhaltnisse des Konigreichs Sachsen* [The Production and Consumption Conditions of the Kingdom of Saxony]. Reprinted in Engel's Die Lebenskosten belgischer Atbeiter-Familien [Cost of Living in Belgian Working-Class Families], Dresden, Germany.

15. Engel, E. (1895), Die Lebenskosten Belgischer Arbeiter-Familien Fruher and Jetzt. *International Statistical Institute Bulletin*, vol. 9, pp. 1–74.

16. Federal Ministry of Agriculture and Rural Development (FMARD) (2016), The Agriculture Promotion Policy (2016-2020), available at: https://fmard.gov.ng/the-green-alternative.

17. Gao, G. (2012), World Food Demand. *American Journal of Agricultural Economics*, vol. 94, is. 1, pp. 25–51. https://doi.org/10.1093/ajae/aar133.

18. Godfray, H. C. J., Crute, I. R., Haddad, L., Lawrence, D., Muir, J. F., Nisbett, N. et al. (2010), The future of the global food system. *Philosophical Transactions of the Royal Society B. Biological Sciences*, vol. 365, is. 1554, pp. 2769–2777. https://doi.org/10.1098/rstb.2010.0180.

19. Haggblade, S., Me-Nsope, N. M. and Staatz, J. M. (2017), Food Security Implications of Staple Food Substitution in Sahelian West Africa. *Food Policy*, vol. 71(C), pp. 27–38. https://doi.org/10.1016/j.foodpol.2017.06.003.

20. Hansen, A. (2018), Consuming Development: Capitalism, Economic Growth and everyday Life. Development Economics, available at: https://developingeconomics.org/2018/01/11/consuming-development-capitalism-economic-growth-andeveryday-life.

21. Hoang, H. K. (2018), Analysis of food demand in Vietnam and short-term impacts of market shocks on quantity and calorie consumption. *Agricultural Economics*, vol. 49, is. 1, pp. 83–95. https://doi.org/10.1111/agec.12397.

22. Holcomb, R. B., Park, J. L. and Oral Capps, Jr. (1995), Revisiting Engel's Law: Examining Expenditure Patterns for Food at Home and Away from Home. *Journal of Food Distribution Research*, vol. 26, is. 2, pp. 1–8. https://doi.org/10.22004/ag.econ.27224.

23. Humphries, D. L., Behrman, J. R., Crookston, B. T., Dearden, K. A., Schott, W. et al. (2014), Households across all income quintiles, especially the poorest, increased animal source food expenditures substantially during recent Peruvian economic growth. *PLoS ONE*, vol. 9, is. 11. e110961. https://doi.org/10.1371/journal.pone.0110961.

24. Ikwuyatum, G. O. (2016), Migration and Urbanisation: exploring the factors of the nexus in Nigeria. *International Journal of Humanities and Social Science*, vol. 6, is. 8, pp. 161–175.

25. Jovanović, M. (2016), Empirical Analysis of Income Changes Impact on Food Consumption Expenditure. *Agriculture & Forestry*, vol. 62, is. 3, pp. 49–56. https://doi.org/10.17707/AgricultForest.62.3.04.

26. Khoury, C. K., Bjorkman, A. D., Dempewolf, H., Ramirez-Villegas, J., Guarino, L., Jarvis, A., Rieseberg, L. H., and Struik, P. C. (2014), Increasing Homogeneity in Global Food Supplies and the Implications for Food Security. *PNAS*, vol. 111, vol. 11, pp. 4001–4006. https://doi.org/10.1073/pnas.1313490111.

27. Leppman, E. J. (1999), Urban-Rural Contrasts in Diet: The Case of China, *Urban Geography*, vol. 20, is. 6, pp. 567–579. https://doi.org/10.2747/0272-3638.20.6.567.

28. Li, N. (2011), An Engel Curve for Variety. Working paper, University of California, Berkeley, available at: http://individual.utoronto.ca/econ_nick_li/ecv.pdf.

29. National Population Commission (NPC) (2006), Population and Housing Census of the Federal Republic of Nigeria, vol. I. Priority Tables, NPC, available at: http://www.population.gov.ng.

30. Ndubueze-Ogaraku, M. E., Governor Ekene Oyita, G. E. and Anyanwu, S. O. (2016), Analysis of Household Consumption Expenditure on Selected Staple Foods in Ika North East Local Government Area of Delta State, Nigeria. *Direct Research Journal of Agriculture and Food Science*, vol. 4, is. 10, pp. 300–307.

31. Obayelu, A. E and Obayelu, O. A. (2014), Strength, Weakness, Opportunities and Threat (SWOT) analysis of the Nigerian Agricultural Transformation Agenda (ATA). *Nigerian Journal of Agriculture Economics*, vol. 4, is. 1, pp. 25–43. https://doi.org/10.22004/ag.econ.267889.

32. Obayelu, A. E., Okoruwa, V. O. and Ajani, O. Y. I. (2011), Analysis of Differences in Rural-Urban Households Food Expenditure Share in Kwara and Kogi States of Nigeria. *Global Journal of Agricultural Sciences*, vol. 10, is. 1, pp. 1–18.

33. Olawuyi, A. T. and Adeoye, I. A. (2018), The prevalence and associated

factors of noncommunicable disease risk factors among civil servants in Ibadan, Nigeria. *PLoS ONE*, vol. 13, no. 9, e0203587. https://doi.org/10.1371/journal.pone.0203587.

34. Ruel, M. T., Garrett, J., Yosef, M. and Olivier, M. (2017), Urbanisation, food security and nutrition: in Nutrition and Health in a Developing World, ed. S. de Pee, D. Taren and M. Bloem. 3rd ed. Springer Science and Business Media, New York, USA.

35. Seto, K. C. and Ramankutty, N. (2016), Hidden linkages between urbanisation and food systems. *Science*, vol. 352(6288), pp. 943–945. https://doi.org/10.1126/science.aaf7439.

36. Theil, H. (1976), Theory and Measurement of Consumer Demand. (Study in Mathematics & Managerial Economics), vol. 2. North-Holland Publishing Company, Amsterdam, Netherlands.

37. Theil, H., Seale, Jr. J. L., and Chung, C. F (1987), A Regional Analysis of Food Consumption in China. *Empec*, vol. 12, pp. 129–135.

38. Tripathi, A. and Srivastava, S. (2011), Interstate Migration and Changing Food Preferences in India. *Ecology of Food and Nutrition*, vol. 50, is. 5, pp. 410-428, https://doi.org/10.1080/03670244.2011.604586.

39. United Nations (UN) (2019), Department of Economic and Social Affairs, Population Division. World Urbanization Prospects: The 2019 Revision.

40. Working, H. (1943), Statistical laws of family expenditure. *Journal of the American Statistical Association*, vol. 38, pp. 43–56.

41. World Health Organization (WHO) (2018), Double burden of malnutrition, http://www.who.int/ nutrition/double-burden-malnutrition/en.

42. Zhou, Y. and Staatz, J. (2016), Projected demand and supply for various foods in West Africa: Implications for investments and food policy. *Food Policy*, vol. 61, pp. 198–212. https://doi.org/10.1016/j.foodpol.2016.04.002

43. Zimmerman, C. C. (1932), Ernst Engel's Law of Expenditures for Food. *The Quarterly Journal of Economics*, vol. 47, is. 1, pp. 78–101.

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