How important are supermarkets for the diets of the urban poor in Africa?

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Abstract:

Many developing countries are undergoing a profound transformation of food systems. Especially in larger cities, supermarkets have become increasingly popular, affecting consumers' food choices and diets. Previous research showed that supermarkets can have both positive and negative effects on dietary quality and nutrition. However, which households actually use supermarkets, and to what extent? While supermarket shopping is positively correlated with income, little is known about how important supermarkets are for the diets of the poor, who are of particular interest from a food policy perspective. The poorest of the urban poor often reside in informal settlements, so they are underrepresented in official surveys. We add to the literature by analyzing food consumption data collected from households in the poorest neighborhoods of Nairobi (Kenya) and Kampala (Uganda). We find high levels of nutritional deficiencies. Despite their ubiquitous presence, supermarkets are not yet very important for the diets of the urban poor. Supermarkets only account for 3% and 0.4% of sample households' total food expenditures in Nairobi and Kampala, respectively. Especially unprocessed foods, which make up the largest share of calorie consumption, are primarily purchased in traditional retail outlets. We also show differences by food groups and income strata.

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Keywords: Supermarkets, traditional retail, diets, urban poor, Africa

1. Introduction

Many low- and middle-income countries are undergoing a substantial transformation in food systems and diets. Evidence suggests that dietary patterns in these countries have shifted towards consumption of more energy dense, processed foods and sedentary lifestyles (Hassen *et al.*, 2017; Rischke *et al.,* 2015; Pingali, 2007; Popkin *et al*., 2012). This transformation is influenced by both supply and demand side factors including population growth, urbanization, income growth and modernization of the retail sector, characterized by rapid penetration of supermarkets (Hassen *et al.*, 2017; Hawkes *et al*, 2009; Pingali, 2007). Whereas supermarket growth was initially concentrated in developed countries in the early waves of diffusion, supermarkets have also become popular in many developing countries. In the recent past, this growth has also been reported in eastern and southern part of Africa (outside South Africa) (Reardon *et al.,* 2012). For instance, Kenya now ranks second after South Africa, with supermarket share of groceries accounting for over 10% of the national retail share in 2016 (Planet Retail, 2016). This share is higher in bigger cities (Chege *et al*., 2015), a trend that is expected to increase in other African countries.

There is a growing body of literature on the link between modern food retail (MFR) outlets and household diets and nutrition among urban consumers, particularly focusing on the role of supermarket purchases (Asfaw, 2008; Demmler *et al*., 2017; Hawkes, 2008; Kimenju *et al.,* 2015; Rischke *et al.,* 2015; Tessier, 2008). Although a certain level of association between supermarkets and diets is reported, the results are mixed. For example, studies by Asfaw (2008), Demmler *et al.* (2017) and Rischke *et al.* (2015) find that supermarket purchases increase the share of processed and highly processed foods. However, Hawkes (2008) finds that dietary implications of supermarkets can be ambiguous. For instance, the effects can be positive e.g. through access to more diverse diets, or negative e.g., by reducing the ability of marginalized

populations (e.g. the poor) to purchase high-quality diets, and encourage consumption of energy-dense, nutrient-poor highly-processed foods.

Whereas these are interesting findings for policy intervention, the results from these studies represent average urban consumers, therefore masking the actual dietary situation for households across different sub-populations. For instance, rapid urbanization in most developing countries has led to proliferation of informal settlements (also known as slums) in most cities. According to UN-HABITAT (2010), over 60% of urban residents in sub-Saharan Africa live in slums. Slums are generally characterized by abject poverty, overcrowding, poor quality of housing, limited access to quality education and health services, inadequate water and sanitation facilities, and high levels of food insecurity (APHRC, 2014; Kimani-Murage *et al*., 2015; UN-HABITAT, 2010). These adverse conditions exacerbated by inability for governments to provide suitable infrastructure and livelihood opportunities make slum residents more vulnerable to the effects of malnutrition. Yet, there is limited knowledge of their diets and purchasing patterns. This information is scarce because slum dwellers have systematically been unrepresented in most studies including national demographic and health surveys and living standards measurement studies (LSMS).

Therefore, whether supermarket purchases can lead to changes in dietary patterns among the urban poor or not, requires knowledge of what these households eat and where they purchase their food items. We address this research gap by; 1) Characterizing the diets and food choices of the urban poor population segment, 2) Establishing the role of supermarkets (modern retail outlets) relative to traditional retail food outlets among the urban poor in Kenya and Uganda. We contribute to literature in two ways. First, we provide a clear understanding of utilization of different retail outlets and their role on household diets, which is key in addressing food and

nutrition insecurity. Second, our focus on the urban poor population contributes to knowledge for intervention in enhancing nutrition among the target population. The rest of the paper is organized as follows: Section 2 gives a detailed description of methods which include study design and data, and key variables used. We discuss the results in section 3, and then conclude in section 4.

2. Methodology

2.1. Study design and data

For our analysis, we use consumer household survey data collected between November and December 2016 in Kenya, and January and February 2017 in Uganda. Kenya and Uganda are interesting countries for our research since the newest estimates (2014) show that about 56% and about 53% of the urban population were living in slums (or informal settlement) in Kenya and Uganda, respectively (World Bank, 2017). To select the specific areas of study, a multi-stage sampling design was used. In the first stage, Nairobi county and Kampala district (capital cities of Kenya and Uganda, respectively) were purposively selected. In the second stage, two constituencies in Nairobi county and two divisions in Kampala district with the highest poverty levels were purposively selected. In Nairobi, Mathare, Ruaka and Kibra (formerly Kibera) constituencies had more than 30% of individuals living below the poverty line based on information published by the Kenya National Bureau of Statistics (KNBS, 2015). Out of the three constituencies, we purposively selected two, Mathare and Kibra, which had the highest contribution to national poverty. In Uganda, recent poverty estimates were not available. Therefore, information on poverty proxies (e.g. slum coverage by area, estimated number of the poor) were obtained from a number of sources such as the 2002 poverty estimates (UBOS and ILRI, 2007), the 2014 population census (UBOS, 2014), and slum profiles published by the

Ministry of Lands, Housing and Urban Development of Uganda (Ministry of Lands, Housing and Urban Development, 2014). Based on this information, Kawempe and Nakawa divisions in Kampala district were selected.

In the third stage, we selected the poorest wards/villages based on information from the administrative offices in different urban sites. In Kenya, we selected three wards in Kibra (Laini saba, Lindi and Makina), and one village in Mathare North area (Mradi). In Uganda, we selected two villages in Kawempe (Bwaise I and Bwaise III), and two villages in Nakawa (Kinawataka and Banda). In the last stage, households were randomly selected using random walk method subject to having at least one child between 6-59 months-households which are considered more vulnerable. The use of random walk method was suitable here because the selected areas are mainly slums with temporary housing structures and no permanent address, or proper census data to identify the households in advance. In total, 600 households were interviewed (details of the sampling distribution are shown in Table A1 in the Appendix).

The questionnaire was carefully pretested in the field and included modules on socioeconomic characteristics, and detailed food and non-food consumption sections. A 7-day food consumption recall data was collected, where respondents were asked to report all the food items consumed during the last seven days prior to the date of the survey. The questionnaire included 112 food items organized in 11 categories: cereals, grains and cereal products; roots, tubers and plantains; nuts and pulses; vegetables; meat, fish and animal products; fruits; milk and milk products; sugars and sweets; oils and fats; and beverages, spices and condiments. We also collected information on whether the food consumed came from purchases, gifts/food aid or from own production (for those who did any urban farming or carried food from their rural homes). For all the food purchased, we asked information regarding the type of retail outlets where the food was purchased. In order to enhance the quality of data, the target respondent was the person

responsible for food choices and preparation within the household. However, other household members, especially households heads were also useful for other sections in the questionnare. We collected the data using the computer aided personal interviews.

Table 1 shows summary characteristics of the sampled households with difference in means between Kenya and Uganda. On average, 67% of the sampled households are headed by men, with approximately 9 years of formal schooling. This proportion is significantly higher in Kenya at 85% than in Uganda at 49%. The results further show that 73% of these households are poor. In Uganda, this proportion is significantly higher (90%) than Kenya (56%). The high level of poverty, also evident by the poor dwelling characteristics shown in Table A2 (see the Appendix), is a typical representation of most urban slum setting. For example, the results show that the average household size of 5. Yet, most of the households live in one roomed houses. This shows high levels of congestion in these households.

Table 1

Sample characteristics

Variables	Pooled sample (N=600)		Kenya (N=300)		Uganda (N=300)	
	Mean	SD	Mean	SD	Mean	SD
Male headed household (dummy)	0.67	0.47	0.85***	0.36	0.49	0.50
Age of household head (years)	35.72	10.71	35.84	8.63	35.60	12.46
Education of household head (years)	8.68	3.58	9.63***	2.64	7.70	4.12
Household size	4.96	2.13	5.09	1.91	4.84	2.33
Proportion of poor (dummy)	0.73	0.44	0.56***	0.50	0.90	0.30
Total dependency ratio	137.69	98.42	111.03***	63.76	164.35	117.98

Notes: *, **, *** significance level at 10%, 5% and 1% levels respectively; significance level is for the difference in means between Kenya and Uganda; SD, standard deviation. Poor households are classified as those with income below the international poverty line of 1.9PPP$.

2.2. Statistical methods

In this paper, we employ descriptive statistical methods to provide an understanding of the diets and purchasing patterns. In terms of diets, we focus on mean household dietary diversity scores, calorie consumption, consumption by processing levels, and their distribution across different income groups. We use household expenditure as a proxy for income. To assess the role of supermarkets, we show how various food retail outlets are utilized by the sampled households and the share of food expenditure allocated to the respective outlets. We also show where different food groups are mainly purchased. The following sub-sections provide a detailed discussion of how the various indicators are measured.

2.3. Household expenditure

Household expenditure was computed as a summation of food and non-food expenditure. Food expenditure was derived from the 7-day food consumption recall data where unit prices were recorded for all commodities purchased. Where applicable, foods that came from own production and gifts were assigned a market value based on the average price of similar products in the same village or a bigger geographical unit. Non-food expenditure was collected based on two reference periods: items purchased in the last one month or last twelve months, based on the frequency of purchase. Total expenditures were converted to monthly values and expressed in international dollar (PPP$) per capita, taking into account consumer price index (CPI)[1] for the respective countries. We further disaggregated the sampled households into three groups (terciles), each containing 33% of the household based on their total monthly expenditure as shown in Table 2. This was necessary to show the variation of the selected indicators across households.

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[1] PPP for year 2015: Kenya = 44.95KES; Uganda = 1185.81UGX. CPI for year 2015: Kenya = 159.60KES; Uganda = 150.75UGX. CPI for year 2016: Kenya =174.52 KES; CPI for year 2017: Uganda =165.45 (KNBS, 2016; UBOS, 2017). CPI for 2016 in Kenya is the average for November and December, while CPI for 2017 in Uganda is the average for January and February.

In both countries, average monthly per capita expenditure and food expenditure increases from the lowest to the highest terciles. Whereas these households spend 56% of their budget on food, we observe some variation across the three groups. In Kenya for instance, households in the lowest tercile spend up to 60% of their budget on food compared to 53% in the highest tercile. In Uganda, households in the lowest tercile spend up to 61% of their budget on food compared to 53% in the highest tercile. This is consistent with earlier research which show that poor households allocate a significant proportion of their income on food (Banerjee and Duflo, 2007; Bloem and de Pee, 2017).

Table 2

Household expenditure

Expenditure tercile	Monthly per capita expenditure (PPP$)		Monthly food per capita expenditure (PPP$)		Share of food expenditure (%)	
	Kenya	Uganda	Kenya	Uganda	Kenya	Uganda
Lowest	54.80	48.8	32.9	28.6	0.60	0.61
	(21.18)	(24.11)	(14.8)	(13.5)	(0.1)	(0.2)
Middle	81.07	80.32	44.9	44.5	0.56	0.56
	(25.77)	(30.01)	(15.3)	(18.3)	(0.1)	(0.1)
Highest	112.40	120.15	59.4	64.1	0.53	0.53
	(38.01)	(49.36)	(25.0)	(35.1)	(0.1)	(0.1)
Sample average	85.83	79.33	47.10	43.90	56.03	56.96
	(37.40)	(45.80)	(21.96)	(27.40)	(0.12)	(0.14)
Pooled	82.58(41.96)		45.49(24.87)		0.56(0.13)	

Note: Standard deviation in parenthesis. PPP is purchasing power parity.

2.4. Dietary indicators

Using the 7-day food consumption recall data, we computed household dietary diversity score (HDDS) and calorie consumption to describe diet composition and intake. HDDS is a count of the number of food groups consumed within a certain reference period prior to the date of the survey. HDDS has been used in previous literature as a proxy to household's economic access to variety of foods (Kennedy *et al.,* 2010; Swindale and Bilinsky, 2006). Following Kennedy *et al.* (2010), we use 12 food groups to compute HDDS. These include: cereals; white roots and tubers,

and plantains; vegetables; fruits; meat; eggs; fish and other sea food; legumes, nuts and seeds; milk and milk products; oils and fats; sweets and sugars; and spices, condiments and beverages.

To obtain calories consumed, the quantities of food consumed within the 7-day period were corrected for nonedible portions, and converted to calories using food composition tables for Kenya (Sehmi, 1993) and Uganda (Hotz *et al*., 2012). The quantity of calories consumed was divided by 7 to obtain daily calorie intake. Total consumption per day at household level was adjusted using adult equivalents (AE) to enable comparison across households of different sizes and composition. According to FAO, WHO and UNU (2001), the required daily intake for a moderately active male adult is 3000 kcal. However, a safe minimum threshold of 80% of the calorie requirement is allowed. This implies that a household is considered undernourished if its consumption is less than 2400 kcal per day per AE.

2.5. Food sources

We characterize all the food retail outlets used by the sampled households as shown in Table 3, by expanding an earlier version of the table developed by Demmler *et al*. (2017). Whereas other modern food retail outlets exist (e.g. hypermarkets, chain stores and convenience stores), supermarkets are the only modern food retail outlet used by these households. Traditional food retail outlets used include local markets/wet markets, roadside vendors, kiosks, mom-and-pop/small shops and hawkers. Supermarkets can either be small, medium or large. While most supermarkets have a large variety of food items, some of the supermarkets within the poor neighborhoods are very small with limited variety of products. Food items sold in supermarkets range from unprocessed to highly processed cereals, legumes, fruits and vegetables, spices, milk, meat etc. Mom-and-pop/small shops are almost similar to supermarkets in terms of food items sold (Demmler *et al.,* 2017). However, mom-and-pop shops have limited variety of products and they sell items in smaller packaging sizes to consumers. For example, more often you do not find

fresh vegetables and fruits in these shops. In addition, mom-and-pop shops are mostly operated by family members and in some cases, supplemented with hired labor (Kumar *et al*., 2008). Moreover, most of these shops may offer goods on credit to frequent and trustworthy customers.

Local markets/wet markets are mainly operated within fixed hours of the day at specific locations. Although they are organized on a daily basis, the number of retailers may increase on particular days of the week (Minten *et al.,* 2010). Main food items sold here include fresh fruits and vegetables, cereals, legumes and roots, tubers and plantains. Food items sold in local markets are sourced from distant rural areas or from neighboring peri-urban farms. Kiosks are temporary structures located close to residential areas with a limited variety of food items. Common food items sold here include fruits and vegetables. Food items sold in kiosks are either obtained from nearby local markets or from peri-urban farms. In addition, most kiosks also sell cooked food like cereals (e.g. roasted and boiled green maize, and beans) and roots and tubers (e.g. cassava and sweet potatoes). Roadside vendors have no fixed locations and operate mainly along busy roads/streets. Like kiosks, roadside vendors also sell cooked food. Hawkers move around residential areas on foot, bicycles, motorcycles or push carts selling food items at people's doorstep. They carry limited variety of food items, and in most cases, only one type of food. Hawkers mainly sell fruits and vegetables, and sometimes dry fish and fresh milk.

Table 3

Characterization of food retail outlets

Source	Characteristics	Main food items
Supermarket (Modern retail)	Self-service; Large variety of foods and brands; Highly processed foods; Refrigerated and frozen food; Limited offer of fresh foods; Non-food products; No credit possibility.	Bread, pasta, cereals, instant noodles, snacks, fats, oils, dairy products, sugar, fruits and vegetables.
Local market (Traditional retail)	Operate within fixed hours of the day; Clustered at specific points; Operate daily but the number of retailers might increase on specific days of the week (market days).	Fruits, vegetables, cereals, roots and tubers, spices.
Roadside vendors (Traditional retail)	Operate along busy roads/streets; No permanent location; Limited variety of food and non-food items; Individual ownership; Credit possibility.	Fruits, vegetables, cereals, roots and tubers.
Kiosks (Traditional retail)	Over the counter-service; Very limited variety of brands; Fresh fruits and vegetables; Unprocessed staples; Small packaging; Individual ownership; Credit possibility	Maize, other staple foods, fruits, vegetables, meat, milk.
Mom-and-pop/small shops (Traditional retail)	Fixed locations; Over the counter-service; Moderate variety of foods and brands; Some refrigerated foods; Small packaging; Processed staples; Individual/family ownership; Credit possibility.	Rice, wheat flour, edible oils, spices and condiments, sugars, milk.
Hawkers (Traditional retail)	No fixed locations; Move around residential areas; Single or a limited food variety of both food and non-food items; possibility of door -to-door delivery; Credit possibility.	Vegetables, fruits, dry fish, fresh milk.

Source: Modified version of Demmler, K. M. *et al.* (2017).

3. Results and discussion

3.1. Characterization of diets and food choices

3.1.1. *Food consumption patterns*

The results in Table 4 show a summary of dietary indicators for the sampled households disaggregated by expenditure terciles. On average, these households consume 2686 kcal per day per adult equivalent (AE). Calorie consumption is significantly higher in Kenya at 2928 kcal per day per AE than in Uganda at 2444 kcal per day per AE. This implies that 45% of households are undernourished, with higher prevalence of undernourishment recorded in Uganda. In both countries, the prevalence of undernourishment in the sampled households is very high compared to the national averages reported in 2015 (19.1% in Kenya and 39% in Uganda) (FAO, IFAD,

UNICEF, WFP and WHO, 2017). This confirms our earlier argument that the true dietary situation of such vulnerable households is generally masked within the national level statistics.

With respect to dietary diversity, diets in Kenya are more diversified (10.4) than Uganda (8.8). This shows that households in Kenya have a better access to food than Uganda. Disaggregated by expenditure terciles, we observe a gradual increase in diet diversification from the lowest to the highest tercile in both countries, thus suggesting a positive association between income and diet diversification. A similar trend is observed in calorie consumption such that as income grows, households consume more calories. This is consistent with previous findings from Rwanda, Uganda and Tanzania (Ecker *et al.,* 2010), which show a strong association between calorie consumption and income. In both countries, households in the lowest tercile consume below the recommended minimum threshold (2344 and 2063 kcal per day per AE in Kenya and Uganda respectively). As a result, there is a decrease in the prevalence of undernourishment from the lowest to the highest terciles. In Kenya, 53% of the sampled households in the lowest tercile are undernourished compared to 23% in the highest tercile. In Uganda, 74% of the households in the lowest tercile are undernourished compared to 42% in the highest tercile.

Table 4

Summary of dietary indicators by expenditure terciles

Expenditure tercile	Household dietary diversity score		Calorie consumption (kcal/day/AE)		Prevalence of undernourishment (%)	
	Kenya	Uganda	Kenya	Uganda	Kenya	Uganda
Lowest	9.46	7.49	2344	2063	52.56	73.77
	(1.55)	(1.70)	(813)	(1060)	(50.26)	(44.17)
Middle	10.43	8.99	3078	2567	25.23	57.30
	(1.30)	(1.47)	(1080)	(1013)	(43.63)	(49.74)
Highest	10.91	10.36	3187	2844	22.52	41.57
	(1.21)	(1.13)	(976)	(1195)	(41.96)	(49.56)
Sample average	10.36	8.79	2928	2444	31.33	59.33
	(1.45)	(1.90)	(1036)	(1135)	(46.46)	(49.20)
Pooled	9.57(1.86)		2686(1112)		45.33(49.82)	

Note: AE, adult equivalents. Standard deviation in parenthesis.

3.1.2. *Energy contribution by food groups*

To better understand the importance of different food groups to these households, we explore their diet composition and contribution of each food group to per capita calorie as shown in Table 5. On average, the results show that 58% and 47% of energy is derived from cereals in Kenya and Uganda, respectively. This corroborates earlier studies which show that cereals remain the most important food source contributing more than 50% of calorie in most developing countries (Alexandratos and Bruinsma, 2012; Kearney, 2010). In Kenya, this is influenced by high consumption of maize, rice, and wheat products. In Uganda, the main cereals consumed in these households are maize and rice. Unlike in Kenya, maize in Uganda is grown mainly as cash crop and not a major part of the diet. Traditionally, main staple foods in Uganda are roots, tubers and plantains (cassava, sweat potatoes, cooking bananas or '*matooke*' etc.) and legumes e.g., beans and groundnuts. However, increasing cost of traditional staple foods has resulted to increased maize consumption especially in urban areas (USAID, 2010). Nonetheless, our data indicates that legumes, and white roots and tubers and plantains also provide a considerable amount of calories in Uganda (17% and 11% respectively).

The results further indicate that consumption of oils and fats is high in Kenya, which is second after cereals, contributing 13% of per capita energy. According to Popkin *et al.* (2012), increased intakes of edible oils and fats could be attributed to availability of inexpensive oils in the market, resulting from enhanced technological advancement. However, there is a decrease in consumption of these oils and fats from the lowest to the largest terciles. This implies that poorer households consume more oils and fats. In both countries, consumption of nutritious foods such as vegetables, fruits, meat, eggs, fish and milk is relatively low. We further observe an interesting trend across expenditure terciles. In Uganda for instance, as the share of calories from cereals decreases from the lowest to the highest tercile, the share of calories from roots, tubers and

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plantains increases. This suggests that households which are better off economically have a preference for roots, tubers and plantains compared to cereals. In addition, the share of calories from fruits, meat and milk and milk products increases gradually from the lowest to the highest terciles in both countries. This means that as income grows, these households are likely to consume more nutritious foods. In both countries, cereals account for the largest share (32%) of the food budget (see Table A3 in the Appendix).

Table 5

Energy contribution by food groups and terciles

Food groups	Kenya				Uganda			
	Total	Lowest	Middle	Highest	Total	Lowest	Middle	Highest
Cereals	57.91	58.43	57.80	57.66	46.73	51.97	44.17	42.10
White roots and tubers, & plantains	2.87	2.33	2.71	3.41	11.12	8.55	11.77	13.97
Vegetables	3.87	4.07	3.71	3.89	1.18	1.23	1.07	1.23
Fruits	2.65	2.12	2.65	3.02	1.09	0.54	1.10	1.84
Meat	1.38	0.77	1.04	2.16	1.28	0.35	0.96	2.86
Eggs	0.64	0.72	0.58	0.63	0.20	0.09	0.23	0.32
Fish & other seafood	2.14	1.84	2.32	2.16	3.70	4.95	2.90	2.78
Legumes, nuts & seeds	4.20	4.03	4.23	4.29	16.95	17.95	18.76	13.76
Milk and milk products	3.14	2.75	3.37	3.19	1.98	0.73	2.38	3.30
Oils & fats	12.89	14.31	13.57	11.22	6.73	6.50	7.13	6.64
Sweets & sugars	8.21	8.59	7.94	8.20	8.89	7.04	9.26	11.04
Spices, condiments & beverages	0.10	0.05	0.07	0.17	0.17	0.11	0.26	0.15

3.1.3. *Characterization of food by processing levels*

We further classify all the food items consumed based on their level of processing as shown in Figure 1. Following FAO (2015), the three main classifications include; unprocessed, medium processed and highly processed. We observe that most food groups are mainly consumed in unprocessed form. However, cereals, which constitute the largest share of the diet, are largely consumed in medium processed form. A small proportion of highly processed cereals, milk products and spices, condiments and beverages is observed in both countries, with higher quantities recorded among households in highest terciles.
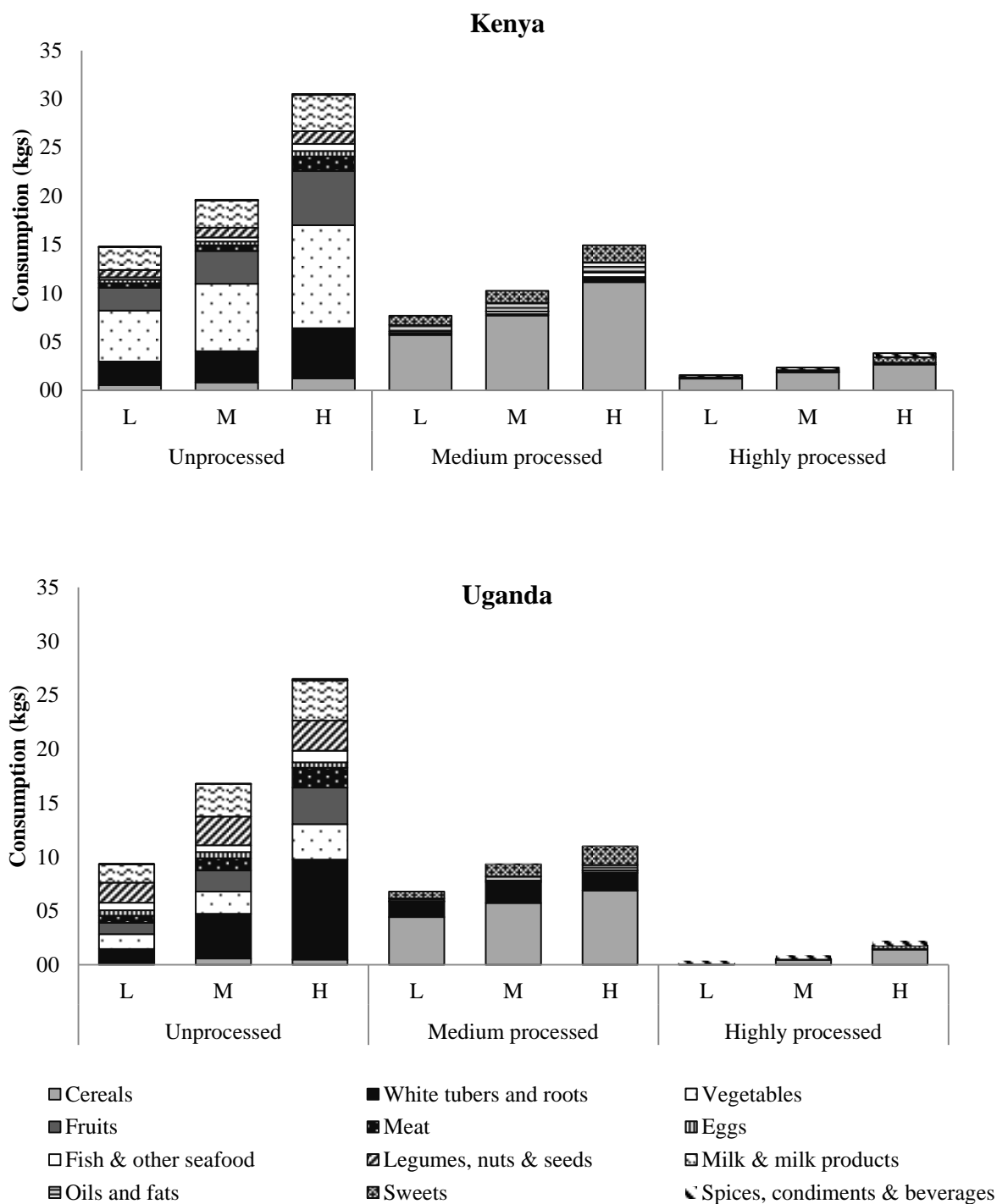
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Figure 1: Consumption of different food groups by processing levels

Notes: L, M and H are lowest, middle and highest terciles respectively. Consumption is based on 7-day recall period. Refer to Table A4 (see the Appendix) for detailed food classification by processing levels.

In general, higher quantities of processed foods are consumed in Kenya than Uganda. However, the quantity of medium to highly processed food consumed increases from the lowest to highest terciles in both countries. This indicates that consumption of processed food is also positively associated with income. While previous studies show that consumption of processed and highly processed food is linked to supermarket purchases, traditional food retail outlets could also be linked to such foods.

3.2. The role of supermarkets

3.2.1. *Utilization of food retail outlets*

Figure 2 shows how the food retail outlets are used across different terciles. Despite the rising importance of modern food retail outlets, only 12% (74 households) of the sampled households had purchased at least one food item from supermarkets within the seven day period. The proportion is significantly higher in Kenya (21%) than Uganda (4%). Across the terciles, the results show that most households that purchased items from supermarkets in both countries are mainly in the highest terciles, therefore suggesting a positive association between supermarket shopping and level of income as shown in other studies (Figuié and Moustier, 2009). In Uganda, no item was purchased from supermarkets within the lowest tercile. While there is an increasing trend of supermarket shopping in urban areas, our results indicate that this is not true for poor households. Mom-and-pop shops are the most popular outlets where nearly all households in both countries purchased at least one food item within the reference period. Kiosks and local markets are also largely used in Kenya and Uganda, respectively. Across expenditure terciles, mom-and-pop shops and kiosks are the more popular in Kenya, while mom-and-pop shops and local markets are more popular in Uganda. We also note that the proportion of households buying from hawkers in Uganda is higher than Kenya.

Kenya

Uganda
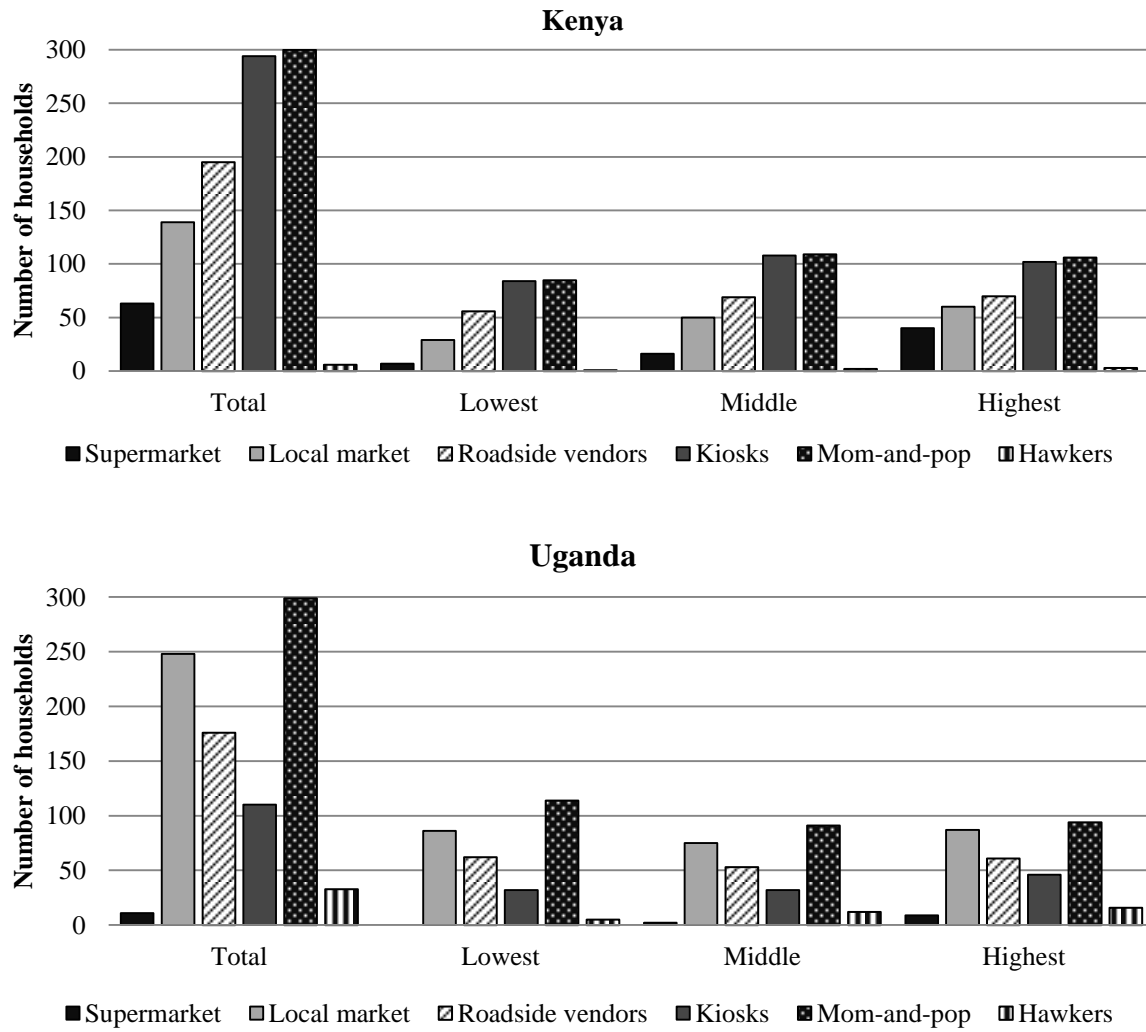
Figure 2: Utilization of different food retail outlets by terciles

We further show the role of supermarkets by comparing the share of food budget allocated to different food outlets. The results in Table 6 show that households shopping from supermarkets only allocate a very small share of the food budget on these outlets (3% in Kenya and 0.4% in Uganda). As expected, households in the highest tercile spend a higher budget share in supermarkets compared to those in the lowest terciles. More than half of the food budget (51% in Kenya and 62% in Uganda) is spent in mom-and-pop shops

Table 6

Share of food expenditure by point of purchase (%)

Retail outlets	Kenya				Uganda			
	Expenditure tercile				Expenditure tercile			
	Lowest	Middle	Highest	Mean	Lowest	Middle	Highest	Mean
Supermarket	0.7	1.0	6.7	3.0	0.0	0.8	0.4	0.4
Local market	5.5	7.4	9.0	7.5	15.1	20.8	31.3	21.6
Roadside vendors	8.3	7.0	7.7	7.6	11.2	11.0	8.1	10.2
Kiosks	31.1	31.2	29.3	30.5	3.5	4.4	6.3	4.6
Mom-and-pop	54.3	53.4	47.3	51.3	69.7	62.3	52.3	62.3
Hawkers	0.1	0.0	0.1	0.1	0.5	0.7	1.6	0.9

One would argue that the popularity of traditional retail outlets in this context could be driven by their ease of access, especially kiosks and mom-and-pop shops, as shown in Table 7. Rationally, this would make them suitable especially where several trips are needed to get all the necessary food items (Reardon and Hopkins, 2006). However, supermarkets are located very close to the residents in Uganda than Kenya, yet only a small proportion of households are shopping from supermarkets. In addition, local markets are located the farthest in both countries compared all the other outlets, yet they are second most utilized in Uganda, and more utilized than supermarkets in Kenya. This implies that distance may not necessarily be an important factor influencing where to purchase food among urban poor households.

Table 7

Mean distance to retail outlets

Variables	Pooled		Kenya		Uganda	
	Mean	SD	Mean	SD	Mean	SD
Supermarket (meters)	953	769	1209***	783	697	664
Local market (meters)	1505	1366	2118***	1528	892	804
Mom- pop-shop (meters)	113	135	136***	143	89	123
Kiosks (meters)	98	121	114***	122	83	119

Notes: *, **, *** significance level at 10%, 5% and1% level respectively. Significance level is for the difference in means between Kenya and Uganda; SD, standard deviation.

3.2.2. *Purchasing points for selected food groups*

The decision to purchase from a particular retail outlet is partly influenced by the type of food item needed. Figure 3 shows that different food groups are purchased from different retail outlets. Market share for different outlets was computed as the proportion of food group purchased from different outlets to the total quantity of the specific food group purchased in the household. Cereals, which constitute a significant share of the diets, are mainly purchased from mom-and-pop shops. Probably this explains the popularity of mom-and-pop shops in both countries. A considerable share of cereals is also purchased from supermarkets in Kenya. In Uganda, local markets are very important because a variety of food items including roots, tubers and plantains, vegetables, milk, meat, and sweets and sugars are purchased there.

In Kenya, vegetables are mainly purchased from kiosks, with a large share also coming from local markets and roadside vendors. In both countries, fruits are mainly purchased from local markets. However, kiosks and hawkers also provide a large share of fruits in Kenya and Uganda respectively. The results further show that in both countries, fruits and vegetables are entirely purchased from traditional retail outlets. This is consistent with findings from studies in Kenya, Zambia (Tschirley *et al.,* 2010), and Nicaragua (Reardon *et al.,* 2010), which showed that over 90% of the fruits and vegetables are purchased from traditional food outlets. Other studies (Gómez and Ricketts, 2013; Neven *et al.*, 2006) also provide evidence that food groups which are important sources of micronutrients including fruits, vegetables and meat are mainly accessed through traditional food outlets. Although moderate share of cereals, milk and milk products, meat, and sweets and sugars are purchased from supermarkets (especially in Kenya), large shares of these foods are obtained the different traditional retail outlets.

Preference for TFR outlets among these households could be associated with a number of factors. First, while TFR outlets may not necessarily sell some food products at lower cost compared to supermarkets, their ability to offer such items in smaller or desirable packaging sizes often attract low-income consumers who may not afford to purchase similar goods in bulk (Minten *et al*, 2010; Rischke *et al.,* 2015). For instance, mom-and-pop shops often buy food items in bulk from large wholesalers, and then repack them in smaller units based on consumer preference before reselling. For some food commodities like meat, the quantities sold vary based on the amount of money the consumers have, which may not be possible in supermarkets. Second, supermarkets mainly focus on offering labelled or branded products, which are relatively more expensive and therefore less sought by the poor (Minten *et al.,* 2010). Third, local markets are associated with fresh food products obtained directly from producers, which attracts both low and high-income consumers. Some kiosks also obtain fruits and vegetables directly from producers or from local markets. In some supermarkets, fruits and vegetables are sourced as far as neighboring countries, and after long travel hours these perishables are no longer fresh regardless of the cooling systems. Lastly, evidence shows that fresh fruits and vegetables are generally expensive in supermarkets compared to traditional retail outlets (Schipmann and Qaim, 2010; Gómez and Ricketts, 2013), hence not affordable for poor households.
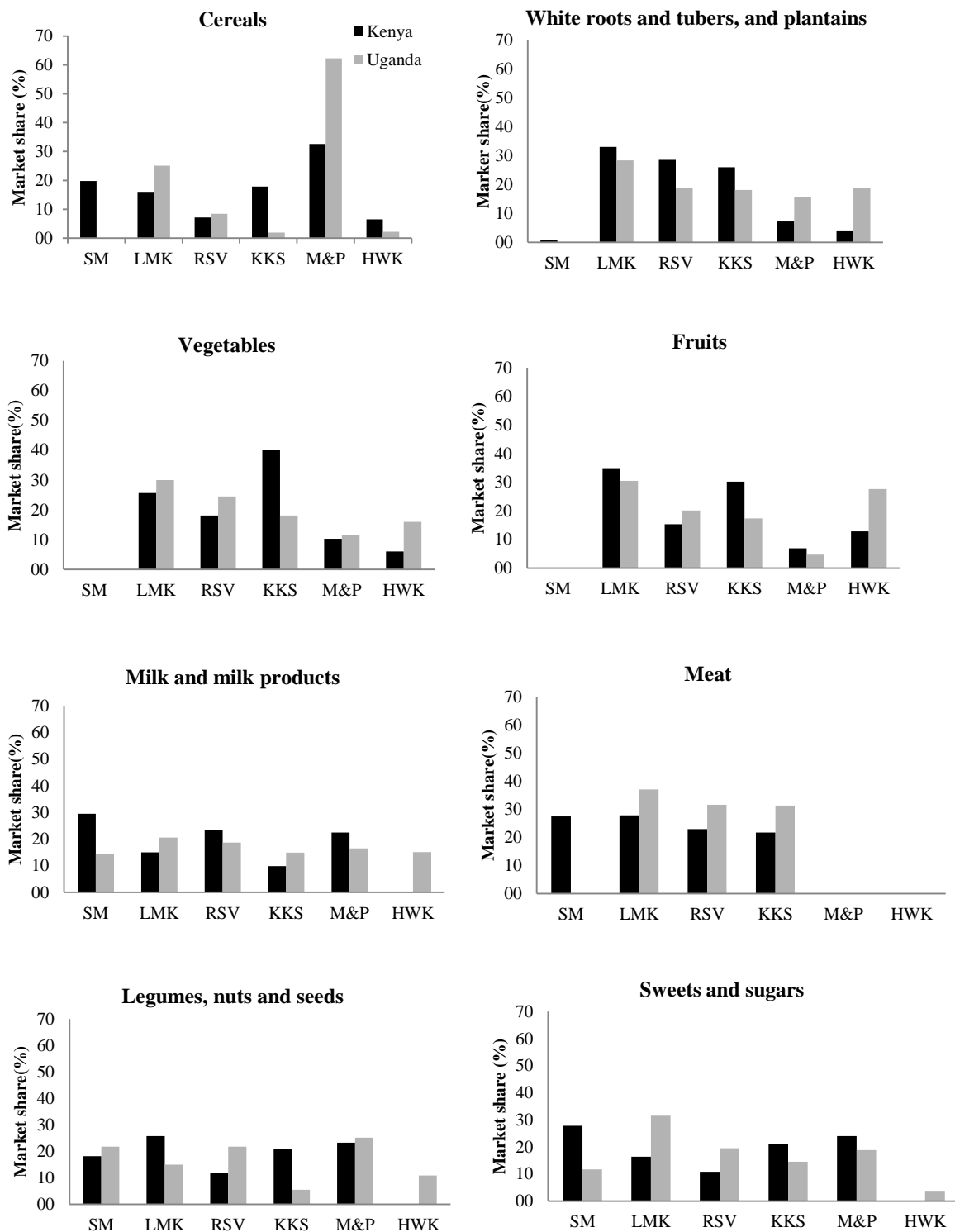
Figure 3: Points of purchase for selected foods groups

Notes: SM, supermarket; LMK, local markets; RSV, roadside vendors; KKS, kiosks; M&P, mom-and-pop shops; HWK, hawkers.

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4. Conclusion

Many low- and middle-income countries are experiencing a substantial transformation in food systems and diets. This is driven by supply and demand side factors including population growth, urbanization, income growth and modernization of the retail sector, characterized by rapid penetration of supermarkets. As result, dietary patterns in these countries tend towards consumption of more energy-dense, processed foods and sedentary lifestyles. Supermarkets in particular are seen as an avenue through which consumers can access more diverse, safe and high quality food products. However, supermarkets can also reduce the ability of marginalized populations e.g. the poor, to purchase high-quality diets, and encourage consumption of energy-dense, nutrient-poor highly-processed foods. The current study describes diets and food consumption patterns among the urban poor, and further explores the role of modern food retail outlets among these household. Using data from consumer household survey in urban Kenya and Uganda, we find that most poor households' diets are largely comprised of carbohydrates from starchy cereals while consumption of nutritious foods like fruits, vegetables and meat is relatively low. Whereas a significant proportion of the household budget is allocated to food, we observe high levels of undernourishment especially in Uganda.

Despite the rapid growth of supermarkets, traditional food retail outlets continue to dominate among the urban poor neighborhoods. Only a small proportion of households, mainly in the highest terciles, are utilizing supermarkets. This portion is much lower in Uganda (4%) than in Kenya (21%). Mom-and-pop shops are the most popular form of TFR outlets used in both countries. This may partly be explained by the fact that cereals, which contribute a significant share of diets, are largely purchased from mom-and-pop shops. In both countries, fruits and vegetables are entirely purchased from TFR outlets across all income groups. Although these households are largely dependent on TFR outlets, we also observe moderate consumption of

medium to highly processed food. Processed food is largely observed in cereals, milk and milk products, oils and fats, sweets and sugars, and spices, condiments and beverages, especially among households in highest terciles. While shopping in supermarkets has been linked to consumption of processed and highly processed foods, traditional retail outlets-particularly mom-and-pop shops could be linked to similar foods.

Even though supermarket growth is expected to continue in the low- and middle-income countries, it is evident that the urban poor households are likely to continue relying on traditional retail outlets. The relevance of traditional food retail outlets among these households could be driven by their competitive edge with respect to convenience in terms smaller or desirable packaging, lower prices especially for fresh fruits and vegetables, availability of fresh produce and credit possibilities. While households with slightly higher income may purchase more food from supermarkets, rising incomes could also create a demand for improved housing and other amenities, thereby causing these households to move to other neighborhoods with better facilities. In the end, other poor households come in the slums, thus creating a continuous cycle. Our findings imply that traditional food retail outlets remain as important avenues for improved food access among these households. Ensuring food and nutrition security would therefore require a more targeted approach towards the marginalized and vulnerable populations. Policies to encourage and promote traditional food retail outlets, especially mom-and-pop stores, to sell more healthy food would enhance better nutritional outcomes among urban poor households.

In spite of these findings, we acknowledge a few limitations in our study. While 7-day food consumption recall data is appropriate in our context, it has a number of shortcomings (de Haen, Klasen and Qaim, 2011; Zezza *et al*., 2017). First, this approach does not account for seasonal variability. For instance, the survey in Uganda was conducted in January and February which is

considered a lean period when food prices are generally high, and so consumption might be slightly lower. On the contrary, the survey in Kenya was conducted in November and December which was shortly after the main harvest season, and so consumption might be slightly higher. However, the effect may not be significant like in farm households since urban households largely rely on markets for food. Second, this approach measures food availability and not actual intake. Third, we are not able to account for intra-household food distribution since we do not capture consumption at individual level and also food consumed away from home. Although we capture this information under the 24-hour recall consumption section included in the questionnaire, we do not use this data for three reasons; (1) the 24-hour recall data is available for only two individuals within the household (one child between 6-59 months and one woman of reproductive age) which does not represent the true picture of the entire household, (2) our main aim was to see how different food retail outlets are utilized, which is not captured under the 24-hour recall data, (3) based on the 24-hor recall data, food consumed away from home was very small to affect the results. Despite these limitations, we do not expect systematic bias in the results.

Further research may consider use of panel data collected over different time periods may improve our understanding of shifts is dietary patterns among these households. In addition, food consumption with shorter recall periods e.g. repeated 24 hour recalls for all household members and anthropometric data may provide useful individual level information on actual consumption.

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Appendix

Table A 1

Sampling distribution

Survey site	County /District	Constituency /division	Ward/Village	Number of households
Kenya	Nairobi	Kibra	Laini saba	50
			Lindi	50
			Makina	50
		Mathare	Mathare North (Mradi)	150
Uganda	Kampala	Kawempe	Bwaise I	70
			Bwaise III	80
		Nakawa	Kinawataka	80
			Banda	70
Total				*600*

Table A 2

Dwelling characteristics

Item	Description	Pooled	Kenya	Uganda
House	Number of rooms in the house	1.2	1.1	1.1
Roofing material (%)	Tiles	2.5	5.0	0.0
	Corrugated metal	95.7	95.0	96.3
	Plastic sheeting	0.2	0.0	0.3
	Thatched/vegetable matter/sticks	1.7	0.0	3.3
Type of floor (%)	Earth/mud/Cow dung	39.0	38.7	39.3
	Concrete/cement	58.7	58.7	59.0
	Tile/brick	2.2	2.7	1.7
Type of wall (%)	Earth/mud/Cow dung	18.0	30.8	43.7
	Concrete/cement	19.0	18.7	18.3
	Tile/bricks	52.0	28.3	4.7
	Wood	2.7	2.3	2.0
	Iron sheet	1.7	16.3	31.0
	wood/mud	6.7	3.5	0.3
Type of toilet (%)	Flush toilet	0.8	1.7	0.0
	Ventilated improved	8.5	5.0	12.0
	Pit latrine	55.3	26.3	84.3
	Bush /field	0.2	0.0	0.3
	Pour flush	34.0	66.7	1.3
	Flying toilet	0.2	0.3	0.0
	Others	1.0	0.0	2.0
Use of toilets (%)	Shared only within the household	4.8	1.0	8.7
	Shares with members within the plot	59.3	54.0	64.7

	Shared within the community	35.8	45.0	26.7

Table A 2

(..*Continued*)

Item	Description	Pooled	Kenya	Uganda
Type of cooking fuel (%)	Electricity	1.2	2.0	0.3
	Piped or liquid propane	2.8	5.7	0.0
	Kerosene	36.7	73.0	0.3
	Firewood	4.5	0.7	8.3
	Charcoal	54.5	18.3	90.7
	Briquettes	0.3	0.3	0.3
Source of drinking water (%)	Pond	0.3	0.0	0.7
	Dam/sand-dam	0.2	0.0	0.3
	Stream/river	0.5	0.0	1.0
	Unprotected spring	0.2	0.0	0.3
	Protected spring	12.8	0.0	25.7
	Wells	10.7	0.0	21.3
	Piped into the house	0.3	0.3	0.3
	Piped into the compound	14.2	19.7	8.7
	Piped outside compound	50.2	59.0	41.3
	Water kiosk	10.0	20.0	0.0
	Water hawkers/cart/bicycle	0.5	1.0	0.0
	Others	0.2	0.0	0.3

Table A 3

Food expenditure share by food groups

Food group	**Kenya**	**Uganda**
Cereals	31.49	32.29
White roots and tubers, and plantains	4.08	15.01
Vegetables	15.31	8.27
Fruits	4.44	3.38
Meat	6.82	4.69
Eggs	2.48	0.54
Fish & other seafood	5.59	4.42
Legumes, nuts & seeds	3.62	14.46
Milk & milk products	10.04	3.68
Oils and fats	5.61	3.01
Sweets & sugars	8.55	8.17
Spices, condiments and beverages	1.97	2.09

Table A 4

Food classification by processing levels

Level of processing	Food groups	Examples
Unprocessed	Eggs, milk & milk products	Eggs, fresh whole milk, natural yoghurt
	Fruits & vegetables	Mango, orange, green leafy vegetables, tomatoes, onions
	Meats	Beef, pork meat, fresh chicken, fresh fish
	Legumes, nuts & pulses	Lentils, black beans, cowpea, groundnuts etc.
	Roots and tubers	Arrow roots, cassava, yams, potato, cooking bananas
	Cereals	Amaranth, sorghum, green maize
Medium processed	Meats	Frozen fish, frozen chicken, dried fish
	Cereals	Rice, maize flour, wheat flour, oats
	Sugars	Jaggery, Sugar
	Oils & fats	Butter, margarine, vegetable oils, peanut butter
Highly processed	Cereals	Bread, cornflakes, pasta
	Milk & milk products	Flavored yoghurt/milk, tinned baby milk
	Meats	Sausages, bacon, ham
	Sugars	Glucose powder
	Sweet drinks and snacks	Chips, soft drinks, cake, popcorn

Source: FAO. 2015