

# HOW IMPORTANT ARE TRADITIONAL RETAIL OUTLETS FOR SOURCING HEALTHY FOODS IN KENYA AND INDIA?



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## SUMMARY

Healthy diets are unaffordable to over 2 billion people worldwide and food access remains a challenge for many. The food environment illustrates the interaction of consumers with different food retail outlets to acquire and consume food. Food access, which includes both physical (proximity) and economic (affordability) factors, is a key component of food security. Understanding where consumers in low- and middle-income countries (LMIC) purchase nutritious foods is the first step to determining which food systems interventions and innovations are most important for these consumers. Despite a large amount of literature considering food procurement in rural or urban communities, there is little agreement on categories of food outlets or terminology and few studies have assessed food procurement patterns across the population and within specific vulnerable groups. We reviewed relevant literature to determine a typology of food retail outlets that can be applied across contexts for easier comparisons. In addition, we analysed secondary data from Kenya (nationwide) and India (2 states) that includes the place of purchase of foods or food groups, to better understand food sourcing patterns. Data are presented disaggregated for rural, peri-urban and city households. The analysis highlights the importance of traditional markets and other informal food outlets for nutritious diets for LMIC consumers, especially those experiencing vulnerability

### KEY MESSAGES

- Understanding where consumers purchase nutritious foods is fundamental to supporting healthy diets with food systems interventions.
- This analysis confirms that traditional markets are central to food sourcing behaviours across residence and income groups, and that population groups more likely to experience vulnerability (esp. female headed households) rely even more on less formal outlets like kiosks and roadside vendors.
- This suggests that food systems approaches must consider how to include and support informal food retail outlets.

## INTRODUCTION

Tackling malnutrition and food insecurity remains a major challenge in the 21<sup>st</sup> century. Worldwide, one in three people is overweight or obese, while over 760 million people are estimated to be undernourished (1,2). Furthermore, food systems have faced unforeseeable shocks—including the COVID-19 pandemic and the war in Ukraine—further increasing food insecurity throughout the world (2). According to the State of Food Security and Nutrition in the World 2022, 350 million people were added to the count of experiencing moderate or severe food insecurity in 2021 compared to the year before the pandemic, and this is likely increasing (2). These global shocks highlight the importance of a comprehensive approach to strengthening food systems to support healthy diets among low-income consumers worldwide.

The urban food system governance literature reflects the importance of the informal food economy, and it is understood that most rural residents are both consumers and producers. The informal food economy is known to be a source of food and livelihood for many (3). However, there is not a comprehensive understanding of the relative importance of a range of food sources across population sub-groups, inside and outside of cities, in low- and middle-income countries (LMICs). Understanding food sourcing strategies among low-income consumers will help to determine which food systems interventions and innovations are most important for these consumers (4,5).

This study contributes to this understanding by analysing the relative importance of various food sources (points of purchase for different food items) across different regions, across socioeconomic brackets, and for different types of nutritious foods. We first review existing literature on food sourcing strategies to define a typology of food sources useful for cross-country comparison. Then we analyse data on household food purchases in Kenya and two states in India, contrasting population sub-groups according to their residence and socio-economic characteristics to better understand food purchase patterns of consumers in LMICs. The emphasis of this study is on various food purchase outlets, as this is least covered in the existing literature. However, given the importance of non-purchased food (including own-production, gifts, and food aid) for low-income consumers' food security, we include this in our analysis of secondary data when possible.

## BACKGROUND

### CLASSIFICATIONS OF FOOD SOURCES

Across the literature, food sources are described and classified differently. While this reflects different food source options across different contexts, there is a need to develop a typology that is broadly applicable to assist in comparisons across studies and contexts.

Authors often differentiate between modern and traditional retail forms. Modern retailers are typically described as selling a wide variety of products—including processed foods, refrigerated and frozen foods, as well as non-food products, and often offer a limited selection of vegetables and fruits (6–9). In addition, they may also be characterised by large floor spaces, multiple cash tills, self-service, and not allowing shoppers to use informal credit (6–9). Supermarkets are the most commonly discussed type of modern retailer. They tend to emphasise a positive customer experience to increase sales (10). Other types of modern retail include hypermarkets—larger warehouse-like outlets, often selling larger quantities—and convenience stores, which are smaller and offer a more limited selection of products (8). Often supermarkets, and other modern outlet types, are owned by multinational corporations and belong to food retail chains offering similar products and brands in different countries and continents (8,11).



Lower prices, higher safety standards, and a larger range of food items are seen as advantages of modern retail (12,13), but there are a number of attributes that make them less advantageous for poor consumers. For instance, the unit sizes are often unaffordable for poor consumers, and they are often located in inconvenient locations, have limited opening hours, and do not provide credit (12).

Traditional food outlets are typically characterised by small floor space (10-30m<sup>2</sup>), few or no cash tills, and over-the-counter service; they often offer purchases on credit and tend to have flexible operating hours (6-9,14). Traditional food outlet types include vending stands, mobile vendors, home-based operators (like spaza or tuck shops), street food vendors, and local, open, or wet markets. Traditional enterprises also tend to be small or micro, unincorporated or unregistered, and thus may be referred to as informal outlets (7-9,14). Traditional markets (also called wet, local, or open markets), are a distinct sub-category of traditional food outlets, as they are made up of many—sometimes hundreds of—vendors. They operate within fixed opening hours, have a fixed location, and may have fixed structures. Products sold are primarily fresh, including cereals, legumes, fruits, vegetables, roots, tubers, and spices (7-9). Small or general shops are small traditional shops with fixed locations and similar offers to small supermarkets in terms of food sold. Typically, no fresh fruits and vegetables and a small range of processed foods are on offer, with smaller packaging sizes; most offer goods on credit to personally known customers (7-9,15-17). Roadside vendors, on the other hand, operate with no fixed structures and mainly along busy roads/streets, offering a limited amount of food and non-food items with credit possibility (7,9). Kiosks or neighbourhood kiosks (1-10 m<sup>2</sup>) are often classified as temporary structures (consisting of fixed or mobile stalls) located close to residential areas with a limited variety of food items, and over-the-counter services with credit possibilities. Such kiosks are typically individually owned, offering small amounts of cereals, fruits, vegetables, roots, and tubers; small units of processed and packaged foods and beverages; and sometimes also cooked foods (7-9,15,18). Hawkers, pushcarts, or mobile vendors operate with no fixed location and move around residential areas on foot, bicycle, or motorcycle while selling food items at people's doorstep. Thus, they offer a limited variety of food items or sometimes only one type of food item, often with negotiable prices (7,9,16,17). Advantages of traditional outlets include proximity or mobility, convenient hours, and provision of credit (6,7,9,14). However, limited vendor awareness and knowledge have been argued to increase the risk of food contamination and hazards and limited infrastructure and missing facilities may pose health and social challenges (6). Based on the reviewed literature, we present a classification of food retail outlets and their typical characteristics in Table 1. In the following sections, we apply this classification and definitions of food outlets or specify when we do not have sufficient information to do so.

Table 1. Classification of food retail outlets

	Retail format	Outlet type	Characteristics	Main food items
More formal ↑	Modern	Hypermarkets	Typically located in big shopping malls; No price negotiations; No credit facilitation	Large variety of food and non-food products, fruits and vegetables, frozen, canned, and cooked food
		Supermarkets	Self-service; Large variety of food samples and brands; No price negotiations; No credit facilitation	Fresh fruits and vegetables; Highly processed foods; Refrigerated and frozen food; Non-food products;
		Convenience stores	Located mostly at small shopping malls; No price negotiations; No credit facilitation	Limited variety of food and non-food products, limited variety of fruits and vegetables, frozen and canned foods
	Traditional fixed	Traditional market	Clustered at specific points; Operate daily but the number of retailers might increase on specific days of the week (market days) Fixed locations and stalls, sometimes facilities available (such as sanitation and waste disposal); Includes open and/or wet markets.	Products sold are primarily fresh (vegetables and fruits) but can also include cereals, legumes, roots, tubers and plantain, spices, and animal-source foods
		General shops	Small Shop/Micro small enterprises; Fixed location; Over the counter/Semi self-service; Limited variety of foods and brands; Sometimes credit possibility; Small packaging, sometimes refrigerated food items; Includes so-called “mom and pop shops” and speciality shops like a butcher.	Rice, flour, sugar, fats and edible oils, spices and condiments, milk, a small range of processed foods and normally no fresh foods
		Kiosk	Fixed or mobile stalls with and without a fixed location; Over the counter-service; Limited variety of brands; Small packaging; Individual ownership; Credit possibility	Maize, other unprocessed staple foods, roots and tubers, fruits, vegetables, meat, milk, a large variety of legumes and cereals, as well as small units of processed and packaged food and beverages, sometimes cooked food (ready-to-eat meals) or packaged snacks
Less formal ↓	Localised ambulant	Roadside vendors	No fixed structure; Operate along busy roads/streets; Limited variety of food and non-food items; Individual ownership; Credit possibility	Fruits, vegetables, cereals, roots, and tubers
		Hawkers or mobile vendors	No fixed locations; Move around residential areas (by foot, bicycle, motorcycle); Single or limited food variety of both food and non-food items; Possibility of door-step delivery; Credit possibility and negotiable prices	Vegetables, fruits, dry fish, fresh milk

Adapted and summarised from Demmler (6), Demmler et al. (7), Khonje et al. (8), Wanyama et al. (9), Global Alliance for Improved Nutrition (GAIN) (15), and the Ministry of State for Planning, National Development and Vision 2030 (16).

## ASSESSING THE IMPORTANCE OF FOOD OUTLET TYPES

In the literature, the relative importance of food sources is measured in two main ways—**purchase of a food or food group at a given food outlet** or **food expenditures at a given outlet**. The first captures where particular foods tend to be purchased and thus allows consideration of the importance of food outlets in terms of how many or what types of foods are purchased there. Typically a binary variable, this indicator tracks whether or not a specific food item or food group is purchased (during the recall period) at a range of food outlets (8,9,11,19–26). The second measure captures how much money consumers spend at particular outlets to capture the importance of food sources in terms of quantities purchased. This indicator is typically calculated using the share of household food consumption expenditure (of a specific food item, food group, or corresponding caloric value) at each food source (8,9,22,24,27). However, a weakness of this measure is that it is difficult to disentangle relative prices across food sources from quantities of foods or food groups purchased.

Studies investigating food sourcing and purchases in cities have largely focused on what is commonly described as the ‘supermarket revolution’, which refers to the growing number of supermarkets in urban areas of LMICs (28–30). A number of studies have explored the tension between traditional and modern retail, as well as the growing role of supermarkets in urban food environments and diets (22,28–30). This has explored the link between supermarkets, consumer diets, and nutrition. Debela et al. (31) showed positive effects of supermarket shopping on child nutrition, while others have found that buying in supermarkets increases adult body mass index (BMI) (7).

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### *Measures of the importance of food outlets*

- *Purchase of a food or food group at a given food outlet*
  - *Food expenditures at a given outlet*
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An extensive household survey in 2008-2009 by the African Food Security Urban Network (AFSUN) analysed the state of food sourcing in 11 South African cities (20,22,32). Households were asked where they purchase food and the **frequency of shopping at the cited food outlets**. Differences in the relative prevalence of use of traditional markets and supermarkets were found across the cities. Out of this initiative, the Hungry Cities Food Purchase Matrix (HCFPM) was established to measure food sourcing behaviour for a pre-defined list of food items. For each item, the matrix captures **whether the food item was purchased in the month before the survey (yes/no), the frequency of purchase**, the typical source, and the respective geographical location of the outlet. The studies found that specific food items are paired with specific food outlets. For example, in Nanjing, most households obtained vegetables, fruits, fresh chicken, and fish from wet markets, while in Maputo fruits and fresh chicken are mostly purchased at formal markets and vegetables at informal markets characterised as all unregistered vendors, street sellers, and stalls on residential plots (11,23). While in Windhoek almost 50% of households purchased food items from a traditional market, and nearly all households sourced food items from supermarkets (97%). Over 90% of households sourced maize meal, pasta, rice, and millet flour from supermarkets, which were also the dominant source for dairy products, meat, and vegetables (25,33).

More recent data from Lusaka, Zambia demonstrate that supermarkets have gained importance in recent years. Food sources were captured via a **seven-day food consumption recall for purchased food items**. While 73% used supermarkets to obtain food items, the same proportion sourced items from the traditional market (8). The average frequency of visits was higher for traditional retail (the

authors defined the traditional retail sector as roadside vendors or traditional markets, grocery stores, and/or neighbourhood kiosks). In addition, the **share of household food expenditures by type of retail** was analysed, showing that 42% of food expenditure is spent in modern retailers (hypermarkets, supermarkets, convenience stores, fast-food restaurants), with observed differences across different income groups (8). Results from a study in urban low-income areas of Nairobi, Kenya and Kampala, Uganda displayed that the vast majority of households (over 80%) shopped at the traditional (open/wet) markets (9). Fifty-one percent and 62% of households in Nairobi and Kampala, respectively, spent more money at general shops than any other outlet. Those with higher incomes used supermarkets more, although still less than other outlets. Similarly, results from a peri-urban community survey of 75 households in Accra, Ghana found that almost all (99%) households sourced food from traditional markets and the vast majority (87%) reported that traditional markets were their preferred outlet (19).

Berger and van Helvoirt (21) surveyed 108 supermarket customers in Nairobi, Kenya, administering an exit survey at a pre-selected supermarket on food sourcing strategies. The data show that kiosks were the **most prevalent source of food** among the survey respondents for food-insecure households (48% reported shopping at kiosks), followed by supermarkets (41%) and traditional (open/wet) markets (7%), while the food-secure respondents acquired most of their food from supermarkets (53%), traditional (open/wet) (23%), and kiosks (17%). The reasons given for patronising the supermarket were availability, lower prices, or discounts (21). In Thailand supermarkets have gained importance as a food source due to perceived improved food safety, better atmosphere, and convenience characteristics (34), however, prices remain significantly higher in supermarkets compared to traditional markets (13).

There were fewer studies that calculated the **types of food purchased at the different food outlets**. In the previously mentioned study in Ghana, the sampled households sourced fresh produce (vegetables and fruits), cereals, roots, tubers, and plantain from traditional markets, while canned goods were purchased from supermarkets or minimarkets (19). Similarly, across multiple studies on urban populations in Thailand, Mozambique, and India, households source fresh produce mainly from traditional (open/wet/traditional) markets or street vendors (23,34,35), whereas packaged goods are purchased from supermarkets (23,34). A survey of slum-dwellers in Nairobi and Kampala showed that most households sourced fresh produce (vegetables and fruits) from kiosks and traditional markets (9)—though, in Nairobi, 20% of households did use supermarkets for this (9).

There is a dearth of literature exploring food sourcing strategies and preferences of rural households beyond tracking own production versus purchased foods. One study from Northern Vietnam contrasts rural, peri-urban, and urban food sourcing patterns, **asking for the source of the consumed food items** aggregating the quantity of food intake by type of retail (26). The rural study population remained reliant on food from home production, while urban households mainly purchase food from traditional (open/wet) markets and specialised shops. In peri-urban districts, a process is evident of shifting from home production towards purchase at the traditional (open/wet) market (26).

## METHODOLOGY

We analyse secondary datasets from Kenya and India to identify the type and quantity of foods that are purchased from specific retail food outlets, contrasting rural, urban (cities), and peri-urban patterns and socio-economic factors using household level consumption data. The relevance of this data for diets is limited because it does not consider intrahousehold allocation. Therefore, we apply the conceptualisation of household food security, as articulated by FAO 2008, comprised of availability, access, utilisation, and stability (36,37). Food availability refers to food supply, access to economic access (or effective demand) and physical access (proximity to markets), utilisation to the



biological processing of food, and stability to being food secure over time. The basket of food consumed by the household reflects food access (with availability as a prerequisite).

## DATA

Based on a scan of publicly available datasets (listed in Annex Table 1), two datasets were identified for inclusion in the analysis. To identify purchase and sourcing patterns, survey data must include the point of purchase of food items in food consumption survey modules.

The **Kenyan integrated household budget survey 2015-2016 (KIHBS)** is the eighth of its kind, produced and collected by the Kenya National Bureau of Statistics and Ministry of Devolution and National Planning (38). The survey collects data on socioeconomic indicators, including household consumption and expenditure patterns, and household characteristics. The specific module of interest is Section T: 'Purchase and consumption of food and related items over the past 7 days' (39). The seven-day household food consumption recall consisted of a pre-defined food item list covering 206 food and beverage items. For each food item, quantity, expenditure, and the point of purchase were captured. Ten different points of purchase for food items were categorised: open markets, kiosks, general shops, roadside vendors/hawkers, supermarkets, specialised shops, establishments/institutions, online local and international, outside of Kenya, and other households. More specifically, supermarkets, hypermarkets, and shopping malls, so-called one-stop shopping points, were grouped into the category of supermarkets. Butchers, chemists, and shops that deal with a specific type of goods were categorised as specialised shops, while establishments/institutions referred to entities where households purchase or pay for a good and service, such as schools and hospitals, but also hotels, restaurants, and other outlets, which sell ready-to-eat goods (39).

The **Drivers of Food Choice eastern India 2017** survey includes data on consumers' attitudes toward food choice and diet diversity in eastern India. It was collected by the International Rice Research Institute within the Drivers Of Food Choice<sup>1</sup> initiative (40). The data were collected in 2017 from 501 respondents in low- and middle-income households in urban and rural districts in the states of West Bengal and Odisha in eastern India. Amongst other topics, information on purchase behaviour and food access was collected in a section on 'Purchase habits and food access'. Respondents were asked to recall where selected food products are usually purchased. The selection of store types was the weekly market, local grocery stores, supermarkets, hypermarkets, and online stores/shops. The data are publicly available and were accessed via the Dataverse platform (41).

## STATISTICAL METHODS

In total, the KIHBS collected data for 21,755 households across the country, while the Indian datasets consist of 501 households in two states, including rural and urban households. Descriptive statistical methods were used to analyse the role of different types of retail outlets in household food consumption and expenditure patterns using Stata 15 statistical software. Continuous variables are summarised using means and standard deviations (SD); the mean comparisons were done using a two-sample t-test. Categorical variables were summarised using frequencies and percentages, and comparisons were analysed using chi-square. Comparisons were done by residence (rural, peri-urban, and city) as well as household structure: female-headed households (FHH) and dual/male-

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<sup>1</sup> <https://driversoffoodchoice.org/>

headed households (D/MHH). The dual/male designation acknowledges that most households described as male-headed also have a female adult in the household.

## MEASUREMENT OF KEY VARIABLES

### FOOD SOURCES

The importance of various food outlets was calculated both across all household consumption and by food group. Food outlet purchases were calculated as a sum of all purchases of individual foods from a given food outlet category within the recall period. Purchases by food group were calculated as a sum of all purchases of individual foods within a given food group during the recall period.

Frequencies (number of purchases by households patronising a food outlet category for one or all food groups) are also presented as the share of households (or household sub-group) patronising a food outlet category. For the Kenya data, food groups were calculated based on guidance from Kennedy et al. (2011) for calculating the Household Dietary Diversity Score (HDDS), but maintaining only 9 of the 12 groups – fruits, vegetables, four animal-source foods, and two staple foods – which comprise critical sources of micro- and macronutrients (42). The system of categorisation of food outlet types presented in Table 1 was applied to both datasets for easier comparison (see Table 2).

**Table 2. Categorising Indian and Kenyan retail outlet types**

India	Kenya	Authors' classification
Supermarkets (supermarkets & hypermarkets)	Supermarket	Supermarket
Vendor	Roadside vendor/hawker	Vendor
Local grocery store	General/specialised shop	General shop
Weekly/wholesale market	Open market	Traditional market

*Note: The retail outlets' dealer, wholesale market, rice mill, and ration shop were not grouped and used within the comparison*

### ECONOMIC ACCESS TO FOOD

Consumed food items were grouped into 12 pre-defined food groups according to Kennedy et al (2011), namely cereals, white roots, tubers and plantain, vegetables, fruits, meat, eggs, fish and seafood, legumes, nuts and seeds, milk and milk products, oil and fats, sweets, and condiments. These food groups are used to calculate the HDDS, which is a household level count of food groups consumed by household members (42). Because it does not account for how food is allocated across household members, this measure is conceptualised as a household's economic food access and is a validated proxy for household food expenditures and household caloric availability (43,44), although there are no validated cut-off points or thresholds (42,45,46).

## RESULTS

This section presents the results of the secondary data analysis, starting with a more detailed analysis of the Kenya IHBS data, and then contrasting these results with the less detailed analysis of data from two states in India.

### FOOD SOURCE PATTERNS IN KENYA

The prevalence of consumption across 12 food groups is displayed by residence and household headship in Table 3. Differences across residence areas were small but statistically significant across most categories. Notably, the prevalence of meat, egg, and fish consumption was highest in cities and lowest in rural communities. Fruit consumption was also highest in cities. However, consumption of vegetables, roots and tubers, milk products, and sweets was highest in peri-urban areas. The prevalence of consumption of legumes/nuts, oils and fats, sweets, and condiments was lowest in

cities. Furthermore, there were statistically significant patterns between D/MHH and FHH. FHH were more likely to report consuming vegetables, fruit, legumes, and milk products, while D/MHH were more likely to report consuming meat, eggs, and fish products.

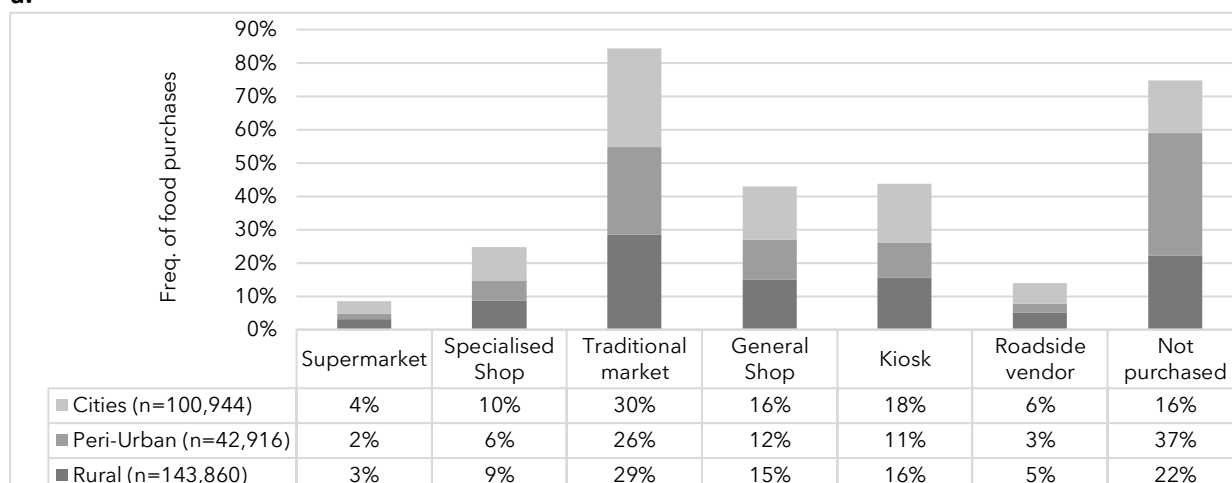
**Table 3. Prevalence of consumption of food groups , comparing residence subgroups to total and dual/male headed households to female headed households**

Food groups	Total (n=21,755)		Rural (n=13,077)	Peri-Urban (n=2,684)	Cities (n=5,994)	FHH (n=7,386)	D/MHH (n=14,369)
	n	%	%	%	%	%	%
Cereals	21,093	<b>97</b>	98***	98***	93***	<b>99</b>	96***
White Roots & Tubers	14,026	<b>64</b>	62***	69***	68***	<b>66</b>	64**
Vegetables	19,820	<b>91</b>	90***	97***	92**	<b>92</b>	91***
Fruit	14,488	<b>71</b>	65**	76***	82***	<b>69</b>	72***
Meat	11,800	<b>54</b>	48***	54	69***	<b>49</b>	57***
Egg	7,481	<b>34</b>	30***	36	44***	<b>31</b>	36***
Fish	7,039	<b>32</b>	30***	33	37***	<b>32</b>	33
Legumes & Nuts	16,700	<b>77</b>	80***	80***	68***	<b>80</b>	75***
Milk & Milk products	18,980	<b>87</b>	87	89**	86**	<b>87</b>	87
Oil & fats	20,300	<b>93</b>	94***	96***	90***	<b>95</b>	93***
Sweets	20,808	<b>97</b>	96***	97***	94***	<b>96</b>	95**
Condiments	21,196	<b>97</b>	99***	99***	94***	<b>98</b>	97***

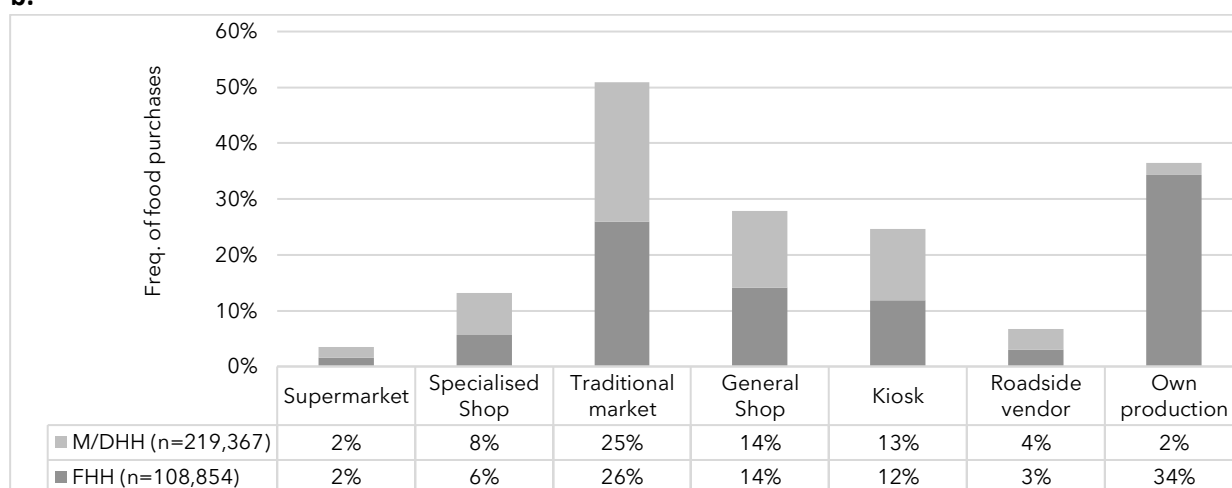
*Note: All variables are binary and displayed as frequencies and/or percentages of the total number of purchases of individual foods within a particular food group. For comparison, a chi-squared test was used, comparing residence sub-groups to non-residence of the sub-group, with levels of significance signalled as follows: \*\*p<0.05, \*\*\*p<0.01. Comparator is in bold.*

In contrast to Table 3, all subsequent analyses included only key nutritious food groups that are typically lacking in diets of LMIC populations, dropping condiments, oils and fats, and sweets. Figure 1 compares the importance of retail outlets by residence (a) and household structure (b), measured as frequencies of purchase of individual food items across nine food groups. Traditional markets were similarly important across sub-groups, although differences were statistically significant: 30% of food purchases in cities were from a traditional market, compared to 29% of rural purchases and 26% of peri-urban purchases. The frequency of traditional market purchases was higher for FHH than DHH by a small but statistically significant amount. Purchases from specialised shops, general shops, roadside vendors, and kiosks were more numerous in cities and among DHH. While the frequency of procuring food without purchasing it (*not purchased* category includes any food items sourced from own production, gifts, or food aid) was vastly higher among FHHs (34%) compared to DHHs (2%) and higher for rural (22%) and peri-urban (37%) households compared to those in cities (16%).

a.



b.



**Figure 1: Frequency of food purchase by food outlet, comparing residence (a) and household structure (b)**

*Note: Includes nine food groups. Dummy variables are displayed as frequencies and/or percentages of the total. n=total number of individual foods purchased for all households (or sub-group of HH's) across 9 food groups. Not purchased includes any food items sourced from own production, gifts, or food aid. For comparison, a chi-squared test was used. All comparisons were significant at  $p < 0.01$ . Sub-groups by residence were compared to non-residence of the sub-group and DHHs were compared to FHHs.*

Table 4 goes into more detail, showing the frequency of purchases at different food outlets. Frequencies are broken down by food group. While patterns were broadly similar across the residence, there were statistically significant differences in most categories, especially comparing rural or city dwellers to the total sample (non-residence group members).

**Table 4. Frequency of food purchases by food group, residence subgroups compared to total**

	Total		Rural	Peri-urban	Cities	Total		Rural	Peri-urban	Cities
	n	%	%	%	%	n	%	%	%	%
<b>Vegetables (n=86,128)</b>						<b>Meat (n=15,249)</b>				
Supermarket	253	<b>0</b>	0***	0	1***	150	<b>1</b>	2***	0**	2***
Specialised Shop	723	<b>1</b>	1***	1	2***	11,746	<b>77</b>	84***	79	85***
Traditional market	39,078	<b>45</b>	49***	46	50***	258	<b>2</b>	2***	2	3***
General Shop	2,729	<b>3</b>	2***	3	2***	169	<b>1</b>	1	1**	1
Kiosk	13,707	<b>16</b>	21***	11***	26***	114	<b>15</b>	1**	2***	1
Roadside vendor	4,581	<b>5</b>	8***	5***	9***	155	<b>1</b>	2***	1	2***
Not purchased	22,315	<b>26</b>	17***	30***	11***	2,408	<b>16</b>	8***	15	6***
<b>Fruits (n=36,224)</b>						<b>Egg (n=7,485)</b>				
Supermarket	122	<b>0</b>	0***	0	1***	66	<b>1</b>	2***	0	2***
Specialised Shop	307	<b>15</b>	1***	0***	2***	64	<b>1</b>	1***	1	2***
Traditional market	15,452	<b>43</b>	48***	41*	50***	247	<b>33</b>	5***	5**	5***
General Shop	956	<b>3</b>	2***	2	2**	2,353	<b>31</b>	44***	24***	51***
Kiosk	5,269	<b>15</b>	20***	8***	24***	1,068	<b>14</b>	20***	11***	23***
Roadside vendor	2,496	<b>7</b>	10***	5***	11***	88	<b>1</b>	12***	1	2***
Not purchased	10,746	<b>30</b>	16***	40***	8***	3,288	<b>44</b>	24***	55***	13***
<b>Cereals (n=68,642)</b>						<b>Fish &amp; Seafood (n=9,339)</b>				
Supermarket	2,636	<b>4</b>	8***	4	10***	41	<b>0</b>	1***	0	1***
Specialised Shop	1,601	<b>2</b>	3***	2	3***	638	<b>7</b>	11***	3***	14***
Traditional market	7,046	<b>10</b>	12***	12***	11***	5,390	<b>58</b>	53***	68***	50***
General Shop	19,258	<b>28</b>	30***	24***	33***	317	<b>3</b>	3***	4**	2***
Kiosk	7,892	<b>12</b>	11***	12**	10***	1,112	<b>12</b>	11**	11	11**
Roadside vendor	379	<b>15</b>	1***	1	1***	837	<b>9</b>	11***	5***	14***
Not purchased	30,000	<b>44</b>	37***	46**	33***	576	<b>6</b>	51***	4**	5***
<b>White Roots &amp; Tubers &amp; Plantain (n=20,905)</b>						<b>Milk &amp; Milk products (n=23,715)</b>				
Supermarket	32	<b>0</b>	0***	0	0***	855	<b>4</b>	7***	2***	10***
Specialised Shop	158	<b>1</b>	1***	1	1***	1,035	<b>4</b>	8***	3***	9***
Traditional market	8,836	<b>42</b>	52***	43	56***	699	<b>3</b>	4***	6***	3**
General Shop	706	<b>3</b>	3***	3	3***	4,437	<b>19</b>	31***	15***	38***
Kiosk	2,271	<b>11</b>	15***	8***	17***	2,013	<b>8</b>	14***	9	17***
Roadside vendor	693	<b>3</b>	5***	3	6***	879	<b>4</b>	5***	3	5***
Not purchased	7,611	<b>36</b>	24***	39***	16***	8,532	<b>35</b>	16	36	7***
<b>Legumes &amp; Nuts (n=24,131)</b>										
Supermarket	321	<b>1</b>	3***	1	3***					
Specialised Shop	390	<b>2</b>	3***	1	4***					
Traditional market	5,587	<b>23</b>	28***	24	30***					
General Shop	4,595	<b>19</b>	21***	16***	24***					
Kiosk	2,067	<b>9</b>	9**	9	9**					
Roadside vendor	372	<b>2</b>	3***	1***	4***					
Not purchased	10,442	<b>43</b>	33***	48***	26***					

Note: "Not purchased" combines food items from own production, own stock, and gifted. Dummy variables are displayed as frequencies and/or percentages of the total number of food purchases. For comparison, a chi-squared test was used, comparing residence sub-groups to non-residence of the sub-group, with levels of significance signalled as follows:

\*\* $p < 0.05$ , \*\*\* $p < 0.01$ . Comparator is in bold.



Traditional markets were the most common source of purchase of roots and tubers (42% of purchases in this food group), vegetables (45%), fruits (43%), seafood (58%), and legumes and nuts (23%). General shops were the most common source of purchase for cereals (28%), as well as eggs (31%) and milk products (19%). Most households purchase meat from specialised shops (77%). Kiosks were not the most common purchase source for any food group, but they were the second-most-common source for all food groups except meat and legumes and nuts.

Traditional markets and kiosks were comparatively more important for city dwellers than for those in other residence areas (Table 4). Non-purchase was a more common source in rural and peri-urban areas, second only to traditional markets. Traditional markets were also most common for purchasing fish and seafood, whereas meat was primarily purchased in speciality (butcher) shops (Table 4). Rural residents were more likely to have non-purchased meat compared to city residents, for whom speciality shops were more important. General shops were more important for the purchase of eggs and milk in cities, while in rural areas these foods were more likely to be non-purchased. In cities, traditional markets were significantly more important for roots, tubers, plantains and legumes and nuts, whereas general shops were more important for cereals. City dwellers also relied more on general shops for roots, tubers, and plantains and general shops for legumes and nuts, compared to those in other areas.

As discussed above, HDDS (Household Dietary Diversity Score) is a proxy for a household's economic access to food (43). To understand how purchase patterns differ depending on HDDS, Table 5 compares patterns for the lowest quartile of HDDS to the highest quartile. For cereals, roots, tubers, plantains, legumes, and nuts, traditional markets and general shops were more important for high-HDDS households, while kiosks were more important for low-HDDS households. Supermarkets were also slightly more important for high-HDDS households for these food groups.

For fruits and vegetables, patterns were similar: high-HDDS households were statistically more likely to purchase these foods from traditional markets whereas low-HDDS households were more likely to purchase them from a kiosk or roadside vendor. For high-HDDS households, fish and seafood were more likely to be purchased at traditional markets, speciality shops, and – to a small but statistically significant extent – supermarkets, whereas meat was sourced from speciality shops and supermarkets but not traditional markets. Low-HDDS households were statistically more likely to source these animal-source foods from kiosks. For eggs, the only statistically significant differences in sourcing patterns were more purchases from general shops by high-HDDS households and roadside vendors for low-HDDS households. Only for milk and among low-HDDS households were respondents more likely to source a food group not by purchasing it (51%).

**Table 5: Food sourcing patterns by household dietary diversity score (HDDS), comparing low HDDS and high HDDS to the total sample**

	Low HDDS (<=8)							High HDDS (>=10)						
	Supermarket	Specialised Shop	Traditional market	General Shop	Kiosk	Roadside vendor	Not purchased	Supermarket	Specialised Shop	Traditional market	General Shop	Kiosk	Roadside vendor	Not purchased
<b>Cereal (n=68,642)</b>	254	498	1,626	3,706	3,280	80	7,856	2,063	774	4,136	11,849	3,051	238	16,226
(% purchases) / p-value	(1%)*	(3%)*	(9%)*	(21%)*	(20%)*	(0%)*	(45%)*	(5%)*	(2%)*	(11%)*	(31%)*	(8%)*	(1%)*	(43%)*
<b>White Roots &amp; Tubers &amp; Plantain (n=20,905)</b>	3	16	839	122	297	106	1,019	27	115	6,639	430	1,517	433	5,050
(% purchases) / p-value	(0%)*	(1%)*	(34%)*	(5%)*	(12%)*	(4%)*	(41%)*	(0%)*	(1%)*	(45%)*	(3%)*	(10%)*	(3%)*	(34%)*
<b>Vegetables (n=86,128)</b>	21	133	6,898	683	2,865	1,022	5,229	208	449	25,008	1,442	8,298	2,655	12,327
(% purchases) / p-value	(0%)*	(1%)*	(39%)*	(4%)*	(16%)*	(6%)*	(30%)*	(0%)*	(1%)*	(48%)*	(3%)*	(16%)*	(5%)*	(24%)*
<b>Fruits (n=36,224)</b>	11	35	1,428	120	751	391	1,607	98	223	11,874	690	3,658	1,693	6,932
(% purchases) / p-value	(0%)*	(1%)*	(32%)*	(3%)*	(17%)*	(9%)*	(36%)*	(0%)*	(1%)*	(46%)*	(3%)*	(14%)*	(7%)*	(27%)*
<b>Meat (n=15,249)</b>	2	1,062	21	15	33	9	509	137	8,940	201	130	53	126	1,561
(% purchases) / p-value	(0%)*	(63%)*	(1%)*	(1%)*	(2%)*	(1%)*	(30%)*	(1%)*	(79%)*	(2%)*	(1%)*	(0%)*	(1%)*	(14%)*
<b>Egg (n=7,485)</b>	4	6	14	139	82	35	199	59	54	217	2,018	863	45	2,684
(% purchases) / p-value	(1%)*	(1%)*	(3%)*	(28%)*	(17%)*	(7%)*	(40%)*	(1%)*	(1%)*	(4%)*	(33%)*	(14%)*	(1%)*	(43%)*
<b>Fish &amp; Seafood (n=9,339)</b>	2	41	738	60	201	106	143	39	544	3,813	208	704	616	346
(% purchases) / p-value	(0%)*	(3%)*	(54%)*	(4%)*	(15%)*	(8%)*	(10%)*	(1%)*	(8%)*	(58%)*	(3%)*	(11%)*	(9%)*	(5%)*
<b>Legumes &amp; Nuts (n=24,131)</b>	18	34	733	812	790	47	2,214	273	295	4,011	2,987	916	286	6,160
(% purchases) / p-value	(0%)*	(1%)*	(16%)*	(17%)*	(17%)*	(1%)*	(47%)*	(2%)*	(2%)*	(27%)*	(20%)*	(6%)*	(2%)*	(41%)*
<b>Milk &amp; Milk products (n=23,715)</b>	84	151	201	740	627	166	3,236	687	703	303	3,012	976	548	3,603
(% purchases) / p-value	(1%)*	(2%)*	(3%)*	(12%)*	(10%)*	(3%)*	(51%)*	(5%)*	(5%)*	(2%)*	(23%)*	(8%)*	(4%)*	(28%)*

Note: 'Not purchased' combines food items from own production, own stock, and gifted. Dummy variables are displayed as frequencies and percentages of the total number of purchases. For comparison between HDDS sub-groups with all households, a chi-squared test was used, with levels of significance signalled as follows: \*\*p<0.05, \*\*\*p<0.01.

## FOOD SOURCING PATTERNS IN TWO INDIAN STATES

The data from India reflect a smaller sample and have less detail than those from Kenya. However, they provide a useful opportunity to explore food purchase patterns by applying the food outlet typology. In total, data on food choices and consumer behaviour were available for 501 households from eastern India. Data were collected in two states, Odisha (51%) and West Bengal (49%), with equal distribution across urban and rural areas. Most of the households (58%) were considered low-income. Participants were asked to identify where they usually purchase five different food groups: rice, fruits, vegetables, meat/poultry/fish, and other cereals. In contrast to the Kenya data, the respondents were only asked to identified one source – where they usually purchase these foods – for each food group.

**Table 6. Food sourcing behaviour in Odisha and West Bengal, India, comparing urban residents to rural**

	Total (n=501)		Rural (n=248)	Urban (n=253)
	n	%	%	%
<b>Meat/fish/poultry</b>				
Traditional market	7	1	<b>2</b>	2
General Shop	484	97	<b>94</b>	99**
Supermarket	9	2	<b>4</b>	0***
<b>Vegetables</b>				
Traditional market	485	97	<b>94</b>	100***
General Shop	12	2	<b>5</b>	0***
Wholesale market	3	1	<b>1</b>	0*
Vendor	1	0	<b>0</b>	0
<b>Fruit</b>				
Traditional market	471	94	<b>90</b>	98***
General Shop	10	2	<b>2</b>	2
Dealer	1	0	<b>0</b>	0
<b>Rice</b>				
Traditional market	115	23	<b>31</b>	15***
General Shop	362	72	<b>63</b>	81***
Supermarket	5	1	<b>1</b>	2
Ration shop	3	1	<b>0</b>	1*
Dealer	5	1	<b>1</b>	1
<b>Cereal</b>				
Traditional market	100	20	<b>36</b>	4***
General Shop	388	77	<b>63</b>	91***
Supermarket	11	2	<b>0</b>	4**

*Note: Dummy variables are displayed as frequencies and percentages. For comparison between urban and rural areas, a chi-squared test was used, with levels of significance signalled as follows: \*\*p<0.05, \*\*\*p<0.01. Comparator is in bold.*

Table 6 displays the frequencies and percentages of households shopping for specific food groups at different retail outlets by residence. For this Indian sample, traditional markets were by far the most important source of fruits and vegetables for rural (90% and 94%) and urban (100% and 98%) households. General shops were more common for rural households purchasing fruits and vegetables, and the difference was statistically significant for the latter. Meat, fish, and poultry were almost exclusively purchased at general shops (97%). All urban residents sampled reported purchasing these animal-source foods at general shops, compared to rural residents who also used supermarkets (4%). Rice was mostly purchased at general shops for rural (63%) and urban (81%) households sampled, but traditional markets were significantly more important for rice purchase

among rural residents (31% compared to 15%). Similar patterns were found for the purchase of other cereals, with most households purchasing from general shops (77%), while traditional markets were more important for rural residents and supermarkets were more important for urban residents.

## DISCUSSION AND CONCLUSION

This study set out to review existing literature on food retail sources to determine a common typology of food retail outlets in LMICs and to examine the patterns of food sourcing across different segments of the population, based on detailed nationwide data from Kenya and more limited data from India. In particular, we were interested in understanding the extent to which traditional markets and other informal outlets – often absent from discourse around improving food systems – are important for sourcing food.

Traditional markets are the most important sources for purchasing **fresh fruits and vegetables** across both countries and all population groups analysed, consistent with a number of other studies (23,34,35). In Kenya, fish, roots and tubers, and legumes and nuts are also commonly sourced from traditional markets. In India, rice and other cereals are typically sourced at general shops. However, rural residents are significantly more likely than urban ones to patronise traditional markets for these foods.

The data from Kenya allowed for additional analysis by household structure (FHH vs. D/MHH) and extent of household food access, as measured by the household dietary diversity score (HDDS). Traditional markets, general shops, and kiosks are all more important for FHHs compared to D/MHH while supermarkets are more important for M/DHH, with differences statistically significant at the 0.01 level. The largest, and statistically significant, differences by gender are for non-purchased foods: 34% of purchases by FHHs reported the use of non-purchased food compared to 2% of D/MHH. Compared to households with high HDDS, households with low HDDS were more likely to purchase foods from 6 of 9 nutritious food groups at kiosks or roadside vendors, with statistically significant differences. While patronage of supermarkets represents a small share of food purchases, high HDDS households were statistically more likely to patronise supermarkets across 8 of 9 food groups.

Applying the categorisation from Table 1 to these results, we see that traditional fixed retail formats are most important for sourcing nutritious foods across all household types assessed. In addition, households with characteristics typically associated with vulnerability, like FHH and low HDDS, are **more likely to rely on less formal outlet types, like kiosks and roadside vendors**. These results are consistent with previous studies that have demonstrated a tendency for food insecure households to rely on kiosks (9,21) and traditional markets (9).

There are some weaknesses in this analysis that should be highlighted. Firstly, the data used is 5-7 years old and, in the context of quickly changing food systems and significant recent shocks, some of the results presented here may no longer be accurate. In addition, only two countries (and only parts of one of them) were included in this analysis, and the analysis did not explore multivariate relationships. However, the broad patterns and lessons align with current understandings of household food procurement patterns. For instance, less formal food outlets support the purchase of smaller quantities of food or the provision of credit, which are common coping strategies when money is scarce (47). Moreover, women experiencing time poverty may be more likely to purchase food from localised outlets, even if prices are higher (48).

This analysis highlights the importance of traditional markets and other informal food outlets for nutritious diets for LMIC consumers, especially those experiencing vulnerability. However, as discussed previously, there can be several health (food safety and handling) and social (infrastructure

and bargaining power) challenges associated with informal food outlets (6,49,50). Thus, a broader approach to food systems transformation, incorporating and strengthening informal sector retailers, is critical for addressing food and nutrition security in LMICs. Furthermore, because women are more likely than men to work in informal food businesses, supporting knowledge, practices, and infrastructure also has the potential to improve women's status (51).



## REFERENCES

1. Development Initiatives. 2020 Global Nutrition Report: Action on equity to end malnutrition. Bristol, UK: Development Initiatives; 2020.
2. FAO, IFAD, UNICEF, WFP, WHO. The state of food security and nutrition in the world: 2022 : repurposing food and agricultural policies to make healthy diets more affordable [Internet]. Rome, Italy: FAO; IFAD; UNICEF; WFP; WHO; 2022 [cited 2022 Jul 14]. Available from: <https://www.fao.org/documents/card/en/c/cc0639en>
3. Resnick D. Informal Food Markets in Africa's Cities. In: 2017 Global Food Policy Report [Internet]. 0 ed. Washington, DC: International Food Policy Research Institute; 2017 [cited 2022 Nov 21]. p. 50–6. Available from: <https://ebrary.ifpri.org/digital/collection/p15738coll2/id/131085>
4. Carletto C, Zezza A, Banerjee R. Towards better measurement of household food security: Harmonizing indicators and the role of household surveys. *Global Food Security* [Internet]. 2013 Mar [cited 2015 May 19];2(1):30–40. Available from: <http://www.sciencedirect.com/science/article/pii/S2211912412000272>
5. Turner C, Kalamatianou S, Drewnowski A, Kulkarni B, Kinra S, Kadiyala S. Food Environment Research in Low- and Middle-Income Countries: A Systematic Scoping Review. *Advances in Nutrition* [Internet]. 2020 Mar 1 [cited 2021 Apr 24];11(2):387–97. Available from: <https://doi.org/10.1093/advances/nmz031>
6. Demmler K. The Role of Small and Medium-Sized Enterprises in Nutritious Food Supply Chains in Africa [Internet]. Global Alliance for Improved Nutrition (GAIN); 2020 Apr [cited 2020 Apr 22]. (Working Paper Series #2). Available from: <https://www.gainhealth.org/sites/default/files/publications/documents/gain-working-paper-series-2-the-role-of-small-and-medium-sized-enterprises-in-nutritious-food-supply-chains-in-africa.pdf>
7. Demmler KM, Ecker O, Qaim M. Supermarket shopping and nutritional outcomes: A panel data analysis for urban Kenya. *World Development* [Internet]. 2018 Feb 1 [cited 2018 Aug 20];102:292–303. Available from: <http://www.sciencedirect.com/science/article/pii/S0305750X17302486>
8. Khonje MG, Ecker O, Qaim M. Effects of Modern Food Retailers on Adult and Child Diets and Nutrition. *Nutrients* [Internet]. 2020 Jun 8 [cited 2020 Jun 10];12(6):1714. Available from: <https://www.mdpi.com/2072-6643/12/6/1714>
9. Wanyama R, Gödecke T, Chege CGK, Qaim M. How important are supermarkets for the diets of the urban poor in Africa? *Food Sec* [Internet]. 2019 Dec 1 [cited 2020 Apr 23];11(6):1339–53. Available from: <https://link.springer.com/article/10.1007/s12571-019-00974-3>
10. Pauline J, Selvi VD. An Analytical View of Hypermarkets vs. Supermarkets. *Journal of Management Research and Analysis* [Internet]. 2018 [cited 2021 Dec 13];(05(02(1))):157–60. Available from: [https://www.academia.edu/37626191/AN\\_ANALYTICAL\\_VIEW\\_OF\\_HYPERMARKETS\\_VS\\_SUPERMARKETS](https://www.academia.edu/37626191/AN_ANALYTICAL_VIEW_OF_HYPERMARKETS_VS_SUPERMARKETS)
11. Si Z, Scott S, McCordic C. Wet markets, supermarkets and alternative food sources: consumers' food access in Nanjing, China. *Canadian Journal of Development Studies / Revue canadienne*

- d'études du développement [Internet]. 2019 Jan 2 [cited 2021 May 19];40(1):78–96. Available from: <https://doi.org/10.1080/02255189.2018.1442322>
12. Battersby J. Food System transformation in the Absence of Food System Planning: The Case of Supermarket and Shopping Mall Retail Expansion in Cape Town, South Africa. *Built Environment*. 2017 Sep 1;43(3):417–30.
  13. Schipmann C, Qaim M. Modern Food Retailers and Traditional Markets in Developing Countries: Comparing Quality, Prices, and Competition Strategies in Thailand. *Applied Economic Perspectives and Policy* [Internet]. 2011 [cited 2021 Apr 27];33(3):345–62. Available from: <https://onlinelibrary.wiley.com/doi/abs/10.1093/aep/ppr018>
  14. GAIN. Urban Food Environments in Low- and Middle-Income Countries [Internet]. Global Alliance for Improved Nutrition (GAIN). 2020 [cited 2021 Apr 26]. Available from: <https://www.gainhealth.org/resources/reports-and-publications/urban-food-environments-low-and-middle-income-countries>
  15. Global Alliance for Improved Nutrition (GAIN). Factsheet: Informal food retail in urban areas [Internet]. GAIN; 2020. Available from: <https://www.gainhealth.org/sites/default/files/publications/documents/informal-food-retail-in-urban-areas.pdf>
  16. Ministry of State for Planning, National Development and Vision 2030. Sessional paper No. 10 of 2012 on Kenya Vision 2030 [Internet]. Office of the Prime Minister, Ministry of State for Planning, National Development and Vision; 2012 p. 172. (Sessional Paper). Report No.: 10. Available from: <https://espas.secure.europarl.europa.eu/orbis/sites/default/files/generated/document/en/KEN YA2030.pdf>
  17. Minten B, Reardon T, Sutradhar R. Food Prices and Modern Retail: The Case of Delhi. undefined [Internet]. 2010 [cited 2021 May 20]; Available from: </paper/Food-Prices-and-Modern-Retail%3A-The-Case-of-Delhi-Minten-Reardon/610c22c54bec20ad49c777a36530294f1680c9e4>
  18. Rischke R, Kimenju SC, Klasen S, Qaim M. Supermarkets and food consumption patterns: The case of small towns in Kenya. *Food Policy* [Internet]. 2015 Apr 1 [cited 2018 Jan 10];52:9–21. Available from: <http://www.sciencedirect.com/science/article/pii/S0306919215000184>
  19. Aryeetey R, Oltmans S, Owusu F. Food retail assessment and family food purchase behavior in Ashongman estates, Ghana. *AJFAND* [Internet]. 2016 Dec 6 [cited 2021 May 3];16(4):11386–403. Available from: <http://ajfand.net/Volume16/No4/Richmond15430.pdf>
  20. Battersby J. Urban food insecurity in Cape Town, South Africa: An alternative approach to food access. *Development Southern Africa* [Internet]. 2011 Oct [cited 2021 Apr 28];28(4):545–61. Available from: <http://www.tandfonline.com/doi/abs/10.1080/0376835X.2011.605572>
  21. Berger M, van Helvoirt B. Ensuring food secure cities – Retail modernization and policy implications in Nairobi, Kenya. *Food Policy* [Internet]. 2018 Aug 1 [cited 2021 Apr 26];79:12–22. Available from: <https://www.sciencedirect.com/science/article/pii/S0306919217301902>
  22. Crush J, Frayne B. Supermarket Expansion and the Informal Food Economy in Southern African Cities: Implications for Urban Food Security. *Journal of Southern African Studies* [Internet]. 2011 Dec 1 [cited 2021 Apr 27];37(4):781–807. Available from: <https://doi.org/10.1080/03057070.2011.617532>

23. Crush J, McCordic C. The Hungry Cities Food Purchases Matrix: Household Food Sourcing and Food System Interaction. *Urban Forum* [Internet]. 2017 Dec 1 [cited 2021 Apr 27];28(4):421–33. Available from: <https://doi.org/10.1007/s12132-017-9321-4>
24. Frayne B, Pendleton W, Crush J, Acquah B, Battersby-Lennard J, Bras E, et al. The State of Urban Food Insecurity in Southern Africa. Kingston and Cape Town: Queen's University and AFSUN; 2010. (Urban Food Security Series). Report No.: No.2.
25. Nickanor N, Kazembe LN, Crush J, Wagner J. Revisiting the African supermarket revolution: The case of Windhoek, Namibia. *Development Southern Africa* [Internet]. 2021 Mar 4 [cited 2021 May 19];38(2):230–47. Available from: <https://doi.org/10.1080/0376835X.2020.1819774>
26. Trinh HT, Linderhof V, Vuong VT, Esaryk EE, Heller M, Dijkxhoorn Y, et al. Diets, Food Choices and Environmental Impacts across an Urban-Rural Interface in Northern Vietnam. *Agriculture* [Internet]. 2021 Feb [cited 2021 Apr 24];11(2):137. Available from: <https://www.mdpi.com/2077-0472/11/2/137>
27. Morris S, Haddad L. Selling to the world's poorest - the potential role of markets in increasing access to nutritious foods. Global Alliance for Improved Nutrition (GAIN) [Internet]. 2020 [cited 2021 Apr 27]; Available from: <https://www.gainhealth.org/resources/reports-and-publications/gain-working-paper-series-14-selling-to-the-world-poorest>
28. Lu L, Reardon T. An Economic Model of the Evolution of Food Retail and Supply Chains from Traditional Shops to Supermarkets to E-Commerce. *American Journal of Agricultural Economics* [Internet]. 2018 [cited 2021 Apr 24];100(5):1320–35. Available from: <https://onlinelibrary.wiley.com/doi/abs/10.1093/ajae/aay056>
29. Reardon T, Hopkins R. The Supermarket Revolution in Developing Countries: Policies to Address Emerging Tensions Among Supermarkets, Suppliers and Traditional Retailers. *Eur J Dev Res* [Internet]. 2006 Dec 1 [cited 2021 Apr 23];18(4):522–45. Available from: <https://doi.org/10.1080/09578810601070613>
30. Suryadarma D, Poesoro A, Akhmadi, Budiati S, Rosfadhila M, Suryahadi A. Traditional food traders in developing countries and competition from supermarkets: Evidence from Indonesia. *Food Policy* [Internet]. 2010 Feb 1 [cited 2021 Apr 26];35(1):79–86. Available from: <https://www.sciencedirect.com/science/article/pii/S0306919209001304>
31. Debela BL, Demmler KM, Klasen S, Qaim M. Supermarket food purchases and child nutrition in Kenya. *Global Food Security* [Internet]. 2020 Jun 1 [cited 2020 Jun 16];25:100341. Available from: <http://www.sciencedirect.com/science/article/pii/S2211912419301105>
32. Frayne B, Crush J, McLachlan M. Urbanization, nutrition and development in Southern African cities. *Food Sec* [Internet]. 2014 Feb 1 [cited 2021 Apr 28];6(1):101–12. Available from: <https://doi.org/10.1007/s12571-013-0325-1>
33. Nickanor N, Kazembe L, Crush J. Supermarkets and informal food vendors in Windhoek, Namibia [Internet]. Hungry Cities Partnership; 2019. (Hungry Cities Partnership | Discussion Paper). Report No.: No. 26. Available from: <https://hungrycities.net/wp-content/uploads/2019/04/DP26.pdf>
34. Gorton M, Sauer J, Supatpongkul P. Investigating Thai Shopping Behaviour: Wet-Markets, Supermarkets and Food Quality [Internet]. 83rd Annual Conference, March 30 - April 1, 2009, Dublin, Ireland. Agricultural Economics Society; 2009 Apr [cited 2021 Apr 27]. (83rd Annual

- Conference, March 30 - April 1, 2009, Dublin, Ireland). Report No.: 51054. Available from: <https://ideas.repec.org/p/ags/aesc09/51054.html>
35. Finzer LE, Ajay VS, Ali MK, Shivashankar R, Goenka S, Sharma P, et al. Fruit and Vegetable Purchasing Patterns and Preferences in South Delhi. *Ecology of Food and Nutrition* [Internet]. 2013 Jan [cited 2021 May 3];52(1):1–20. Available from: <http://www.tandfonline.com/doi/abs/10.1080/03670244.2012.705757>
  36. FAO. An Introduction to the Basic Concepts of Food Security [Internet]. EC - FAO Food Security Programme; 2008 [cited 2022 Nov 21]. Available from: <https://www.fao.org/3/al936e/al936e00.pdf>
  37. Devereux S, Béné C, Hoddinott J. Conceptualising COVID-19's impacts on household food security. *Food Sec* [Internet]. 2020 Aug 1 [cited 2022 Nov 21];12(4):769–72. Available from: <https://doi.org/10.1007/s12571-020-01085-0>
  38. Kenya National Bureau of Statistics. Kenya Integrated Household Budget Survey (IHBS) 2015-2016. Ref. KEN\_2015\_IHBS\_v01\_M. Dataset downloaded from [URL] on 10/2021 [Internet]. 2021 [cited 2021 May 19]. Available from: <https://catalog.ihns.org/index.php/catalog/7432>
  39. Kenya National Bureau of Statistics. Kenya Integrated Household Budget Survey (KIHBS) 2015-16. Interview's Manual. WI-20-39-1. KNBS; 2015.
  40. Ynion J, Custodio MC, Samaddar A, Mohanty SK, Cuevas RP, Demont M. Survey data on consumers' attitudes on food choice and diet diversity in eastern India (2017) [Internet]. Harvard Dataverse; 2021 [cited 2021 Jun 14]. Available from: <https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/IRSPY>
  41. Ynion J, Custodio MC, Samaddar A, Demont M. Survey data on consumers' food choice and diet diversity in eastern India (2018) [Internet]. Harvard Dataverse; 2020 [cited 2021 May 29]. Available from: <https://dataverse.harvard.edu/citation?persistentId=doi:10.7910/DVN/EUWMNW>
  42. Kennedy G, Ballard T, Dop M. Guidelines for measuring household and individual dietary diversity. Rome, Italy: Food and Agriculture Organization of the United Nations; 2011.
  43. Hoddinott J, Yohannes Y. Dietary Diversity as a Household Food Security Indicator [Internet]. Washington, D.C: Food and Nutrition Technical Assistance Project, Academy for Educational Development; 2002 [cited 2022 Oct 5]. Available from: [https://pdf.usaid.gov/pdf\\_docs/Pnacq758.pdf](https://pdf.usaid.gov/pdf_docs/Pnacq758.pdf)
  44. Headey D, Ecker O. Rethinking the measurement of food security: from first principles to best practice. *Food Sec* [Internet]. 2013 Jun 1 [cited 2022 Nov 21];5(3):327–43. Available from: <https://doi.org/10.1007/s12571-013-0253-0>
  45. FAO, FHI 360. Minimum Dietary Diversity for Women (MDD-W): A Guide for Measurement [Internet]. Rome, Italy: Food and Agriculture Organization of the United Nations; 2016 [cited 2016 Oct 30]. Available from: <http://www.fantaproject.org/monitoring-and-evaluation/minimum-dietary-diversity-women-indicator-mddw>
  46. Swindale A, Bilinsky P. Household Dietary Diversity Score (HDDS) for Measurement of Household Food Access: Indicator Guide (v.2) [Internet]. Washington, D.C: FHI 360/FANTA; 2006 [cited 2014 Jan 22]. Available from: <http://www.fantaproject.org/monitoring-and-evaluation/household-dietary-diversity-score>

47. Aberman NL, Gelli A, Agandin J, Kufoalor D, Donovan J. Putting consumers first in food systems analysis: identifying interventions to improve diets in rural Ghana. Food Sec [Internet]. 2022 May 20 [cited 2022 Oct 13]; Available from: <https://doi.org/10.1007/s12571-022-01277-w>
48. Garrett J, Ruel M. Nutrition and SDG 11: Healthy diets, nutrition and urban settlements [Internet]. Italy: The Alliance of Bioversity International and the International Center for Tropical Agriculture (CIAT; 2020 Jan [cited 2022 Oct 13]. Available from: <https://hdl.handle.net/10568/107124>
49. Roesel K. Food Safety and Informal Markets: Animal Products in Sub-Saharan Africa [Internet]. 1st ed. Routledge; 2014 [cited 2020 May 11]. Available from: <https://www.taylorfrancis.com/books/9781315745046>
50. Grace D. Food Safety in Low and Middle Income Countries. Int J Environ Res Public Health [Internet]. 2015 Sep [cited 2022 Nov 22];12(9):10490–507. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4586623/>
51. Aberman NL, Meerman J, van de Riet A. Integrating Gender into the Governance of Urban Food Systems for Improved Nutrition [Internet]. Global Alliance for Improved Nutrition (GAIN); 2022 Feb [cited 2022 Oct 13]. Available from: <https://www.gainhealth.org/sites/default/files/publications/documents/GAIN-Working-Paper-Series-25-Integrating-Gender-into-the-Governance-of-Urban-Food-Systems-for-Improved-Nutrition.pdf>



## ANNEX

Annex Table 1. Checked available Data Sources

Country	Title	Year	HH Food Consumption	Point of Purchase	Link	Data-source
11 Cities	AFSUN collected data in 11 African cities				<a href="https://www.afsun.org/projects/">https://www.afsun.org/projects/</a>	
Afghanistan	Demographic & Health Survey	2015	no	no	<a href="https://microdata.worldbank.org/index.php/catalog/2786/study-description">https://microdata.worldbank.org/index.php/catalog/2786/study-description</a>	WB
Bangladesh	Household income and expenditure survey (HIES)	2010	yes	no	<a href="https://catalog.ihns.org/index.php/catalog/2257">https://catalog.ihns.org/index.php/catalog/2257</a>	WB
Bangladesh	Chattogram Low Income Area Gender, Inclusion, & Poverty Survey	2019	Yes	no	<a href="https://microdata.worldbank.org/index.php/catalog/3704">https://microdata.worldbank.org/index.php/catalog/3704</a>	World Bank
Bangladesh	Bangladesh Bio-fortified Rice Project - Baseline Dietary Survey	2007-08	yes	?	<a href="http://www.fao.org/gift-individual-food-consumption/data-&amp;-indicator/en/">http://www.fao.org/gift-individual-food-consumption/data-&amp;-indicator/en/</a>	FAO/WHO GIFT
Bangladesh	Demographic & Health Survey	2017-18	no	no	<a href="https://microdata.worldbank.org/index.php/catalog/3825">https://microdata.worldbank.org/index.php/catalog/3825</a>	WB
Bangladesh	Bangladesh Integrated Household Survey (BIHS)	2018-19	yes	no	<a href="https://dataverse.harvard.edu/file.xhtml?fileId=4097604&amp;version=2.0">https://dataverse.harvard.edu/file.xhtml?fileId=4097604&amp;version=2.0</a>	IFPRI
Bangladesh	Bangladesh Integrated Household Survey (BIHS)	2015	yes	no	<a href="https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/BXSYEL">https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/BXSYEL</a>	IFPRI
Bangladesh	US Global Food Security Strategy (GFSS) Baseline Survey	2018-19	yes	no	<a href="https://doi.org/10.7910/DVN/OTOBEJ">https://doi.org/10.7910/DVN/OTOBEJ</a>	IFPRI
Bangladesh	Bangladesh Agricultural Value Chain (AVC) Impact Evaluation: Baseline Survey	2017	yes	no	<a href="https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/XNAHHB">https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/XNAHHB</a>	IFPRI
Ethiopia	HICES	2004	yes	no	<a href="https://microdata.worldbank.org/index.php/catalog/1069/related-materials">https://microdata.worldbank.org/index.php/catalog/1069/related-materials</a>	WB
Ethiopia	Socioeconomic Survey	2019	yes	no	<a href="https://microdata.worldbank.org/index.php/catalog/3823/related-materials">https://microdata.worldbank.org/index.php/catalog/3823/related-materials</a>	WB
Ethiopia	Demographic & Health Survey	2016	no	no	<a href="https://microdata.worldbank.org/index.php/catalog/2886/related-materials">https://microdata.worldbank.org/index.php/catalog/2886/related-materials</a>	WB
Ethiopia	Ethiopia Alive & Thrive End line Survey: Households	2014	no	no	<a href="https://doi.org/10.7910/DVN/JJPOLK">https://doi.org/10.7910/DVN/JJPOLK</a>	IFPRI
Ethiopia	Vegetable Value Chain Survey in Ethiopia: Producer/Household Survey	2020	yes	no	<a href="https://doi.org/10.7910/DVN/Q55PL6">https://doi.org/10.7910/DVN/Q55PL6</a>	IFPRI
Ethiopia	Socioeconomic Survey	2015-16	yes	no	<a href="https://microdata.worldbank.org/index.php/catalog/2783">https://microdata.worldbank.org/index.php/catalog/2783</a>	WB
Ethiopia	Household Income Consumption & Expenditure	2010-11	Yes	yes	<a href="https://catalog.ihns.org/catalog/3123/related-materials">https://catalog.ihns.org/catalog/3123/related-materials</a>	IHSN
Gambia	Integrated Household Survey	2015	yes	no	<a href="https://microdata.worldbank.org/index.php/catalog/3323">https://microdata.worldbank.org/index.php/catalog/3323</a>	WB
Ghana	Nutrition Ghana End line Study	2018	yes	no	<a href="https://dataverse.harvard.edu/file.xhtml?fileId=4160214&amp;version=1.0">https://dataverse.harvard.edu/file.xhtml?fileId=4160214&amp;version=1.0</a>	IFPRI
India	National Family Health Survey	2015-16	no	no	<a href="https://microdata.worldbank.org/index.php/catalog/2949/study-description">https://microdata.worldbank.org/index.php/catalog/2949/study-description</a>	WB

Country	Title	Year	HH Food Consumption	Point of Purchase	Link	Data-source
Ghana	Dietary transitions in Ghana	2017	no	(yes)	<a href="https://dataverse.ird.fr/datasets.xhtml?persistentId=doi:10.23708/HGMZKX&amp;version=1.0">https://dataverse.ird.fr/datasets.xhtml?persistentId=doi:10.23708/HGMZKX&amp;version=1.0</a>	DataVerse
India	Household Consumer Expenditure Survey	2012	yes	no	<a href="http://microdata.gov.in/nada43/index.php/catalog/126/data_dictionary">http://microdata.gov.in/nada43/index.php/catalog/126/data_dictionary</a>	WB
India	National Sample Survey 66th Round	2009	?	?	<a href="https://datatopics.worldbank.org/consumption/detail">https://datatopics.worldbank.org/consumption/detail</a>	WB
India	LSMS - Uttar Pradesh & Bihar Survey of Living Conditions	1997-98	yes	no	<a href="https://microdata.worldbank.org/index.php/catalog/276">https://microdata.worldbank.org/index.php/catalog/276</a>	WB
India	National Family Health Survey	2015-16	no	no	<a href="https://microdata.worldbank.org/index.php/catalog/2949">https://microdata.worldbank.org/index.php/catalog/2949</a>	WB
India	A&T India Maternal Nutrition Baseline Survey: Households - Pregnant Women	2017	no	no	<a href="https://doi.org/10.7910/DVN/G8DH3M/FEXSUB">https://doi.org/10.7910/DVN/G8DH3M/FEXSUB</a>	IFPRI
India	Survey data on consumers' food choice & diet diversity in eastern India	2018	no	yes	<a href="https://doi.org/10.7910/DVN/EUWMNW/CQSLWG">https://doi.org/10.7910/DVN/EUWMNW/CQSLWG</a>	DataVerse
Indonesia	National Socio-Economic Survey	2010	yes	no	<a href="https://catalog.ihsn.org/index.php/catalog/4798">https://catalog.ihsn.org/index.php/catalog/4798</a>	IHSN
Indonesia	Demographic & Health Survey	2017	no	no	<a href="https://microdata.worldbank.org/index.php/catalog/3477/related-materials">https://microdata.worldbank.org/index.php/catalog/3477/related-materials</a>	WB
Indonesia	ARENA's DHS-GIS Database		no	no		IFPRI
Indonesia	National Socio-Economic Survey (SUSENAS)	2010	yes	no	<a href="https://www.ilo.org/surveyLib/index.php/catalog/2064/related-materials">https://www.ilo.org/surveyLib/index.php/catalog/2064/related-materials</a>	ILO
Kenya	Integrated Household Budget Survey	2015-16	yes	yes	<a href="http://statistics.knbs.or.ke/nada/index.php/catalog/88/study-description">http://statistics.knbs.or.ke/nada/index.php/catalog/88/study-description</a>	ILO
Malawi	Integrated Household Panel Survey 2010-2013-2016-2019		yes	no	<a href="https://catalog.ihsn.org/catalog/8702/related-materials">https://catalog.ihsn.org/catalog/8702/related-materials</a>	IHSN
Malawi	Integrated Household Panel Survey	2010-13	yes	no	<a href="https://microdata.worldbank.org/index.php/catalog/2248">https://microdata.worldbank.org/index.php/catalog/2248</a>	WB
Malawi	Fifth Integrated Household Survey	2019-20	yes	no	<a href="https://microdata.worldbank.org/index.php/catalog/3818/related-materials">https://microdata.worldbank.org/index.php/catalog/3818/related-materials</a>	WB
Mauritius	Household Budget Survey	2017	no	yes	<a href="https://catalog.ihsn.org/catalog/8765/related-materials">https://catalog.ihsn.org/catalog/8765/related-materials</a>	IHSN
Mongolia	Household Socio-Economic Survey	2007-08	yes	no	<a href="https://catalog.ihsn.org/index.php/catalog/2153">https://catalog.ihsn.org/index.php/catalog/2153</a>	IHSN
Mozambique	Family budget survey	2008-09	yes	yes	<a href="https://catalog.ihsn.org/index.php/catalog/2168/related_materials">https://catalog.ihsn.org/index.php/catalog/2168/related_materials</a>	IHSN
Mozambique	Inquérito Demográfico e de Saúde	2011	no	no	<a href="https://microdata.worldbank.org/index.php/catalog/1563/related-materials">https://microdata.worldbank.org/index.php/catalog/1563/related-materials</a>	WB
Multi-country	Agricultural Extension Services & Technology Adoption Survey	2018	yes	no	<a href="https://doi.org/10.7910/DVN/JCXY6E">https://doi.org/10.7910/DVN/JCXY6E</a>	IFPRI
Niger	National Survey on Household Living Conditions & Agriculture	2014	no	no	<a href="https://microdata.worldbank.org/index.php/catalog/2676">https://microdata.worldbank.org/index.php/catalog/2676</a>	WB
Nigeria	Living Standards Survey	2019	yes	no	<a href="https://microdata.worldbank.org/index.php/catalog/3827/related-materials">https://microdata.worldbank.org/index.php/catalog/3827/related-materials</a>	WB

Country	Title	Year	HH Food Consumption	Point of Purchase	Link	Data-source
Nigeria	General Household Survey, Panel	2015-16	yes	no	<a href="https://microdata.worldbank.org/index.php/catalog/2734">https://microdata.worldbank.org/index.php/catalog/2734</a>	WB
Pakistan	Demographic & Health Survey	2017-18	no	no	<a href="https://microdata.worldbank.org/index.php/catalog/3683/data-dictionary">https://microdata.worldbank.org/index.php/catalog/3683/data-dictionary</a>	WB
Pakistan	Multiple Indicator Cluster Survey, Punjab	2011	yes	no	<a href="https://microdata.worldbank.org/index.php/catalog/2211/related-materials">https://microdata.worldbank.org/index.php/catalog/2211/related-materials</a>	WB
Pakistan	Social & Living Standards Measurement Survey	2010	yes	no	<a href="https://catalog.ihns.org/index.php/catalog/6181">https://catalog.ihns.org/index.php/catalog/6181</a>	IHSN
Pakistan	Integrated Household Survey	1991	yes	no	<a href="https://microdata.worldbank.org/index.php/catalog/543">https://microdata.worldbank.org/index.php/catalog/543</a>	WB
Pakistan	Demographic & Health Survey	2017-18	no	no	<a href="https://microdata.worldbank.org/index.php/catalog/3411/related-materials">https://microdata.worldbank.org/index.php/catalog/3411/related-materials</a>	WB
Pakistan	Household Integrated Income & Consumption Survey	2015-16	yes	no	<a href="https://catalog.ihns.org/catalog/8525/related-materials">https://catalog.ihns.org/catalog/8525/related-materials</a>	IHSN
Pakistan	Household Integrated Economic Survey	2010-11	yes	no	<a href="https://catalog.ihns.org/catalog/4585/related-materials">https://catalog.ihns.org/catalog/4585/related-materials</a>	IHSN
Sierra Leone	Integrated Household Survey	2011	yes	no	<a href="https://microdata.worldbank.org/index.php/catalog/2943">https://microdata.worldbank.org/index.php/catalog/2943</a>	WB
South Africa	National Income Dynamics Study	2017	yes	no	<a href="https://www.datafirst.uct.ac.za/dataportal/index.php/catalog/712/study-description">https://www.datafirst.uct.ac.za/dataportal/index.php/catalog/712/study-description</a>	
Tanzania	National Panel Survey	2016	Yes	Yes – for 2 outlets	<a href="https://microdata.worldbank.org/index.php/catalog/2862/get-microdata">https://microdata.worldbank.org/index.php/catalog/2862/get-microdata</a>	WB
Tanzania	Household Budget Survey Tanzania	2017-18	yes	Yes – for 2 outlets	<a href="https://catalog.ihns.org/catalog/111/get-microdata">https://catalog.ihns.org/catalog/111/get-microdata</a>	IHSN
Uganda	National Panel Survey	2018-19	yes	no	<a href="https://catalog.ihns.org/catalog/9539">https://catalog.ihns.org/catalog/9539</a>	IHSN
Uganda	National Panel Survey	2019-20	yes	no	<a href="https://microdata.worldbank.org/index.php/catalog/3902/related-materials">https://microdata.worldbank.org/index.php/catalog/3902/related-materials</a>	WB

*Note: HH Household. In total five different data sets were identified (see highlights) that include point of purchase questions, but ultimately only two were deemed suitable for this analysis. Those included the Kenya Integrated Household Budget Survey 2015-2016 (KIHBS) & a data set from the drivers of food choice (DFC) initiative in eastern India. The data set of eastern India only covers selected food groups, nevertheless, this data set is used as a small case comparison.*

**Annex Table 2. Distribution of consumed food from own production and stock, gift, or purchased according to location, gender of household head (food item level)**

	Own Production	Own Stock	Gift	Purchased
Total	(18%)	(11%)	(5%)	(69%)
Rural	(9%)	(10%)*	(4%)*	(79%)*
Peri-urban	(22%)	(11%)*	(5%)*	(65%)*
Cities	(4%)	(10%)*	(3%)*	(85%)*
Female-Headed Households	(18%)	(11%)	(6%)	(67%)
Dual/Male-Headed Household	(18%)	(10%)*	(4%)*	(69%)*

*Note: Dummy variables are displayed as percentages in brackets and p-values. For comparison chi-square was used, comparing the residence sub-group to the non-residence of the sub-group. \*p<0.1, \*\*p<0.05, \*\*\*p<0.01.*