The Changing Food Expenditure Patterns and Trends in Zambia: Implications on Agricultural Policies

by

Brian Chisanga and Olipa Zulu-Mbata

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EXECUTIVE SUMMARY

Zambia, like many other African countries is undergoing rapid urbanization and rising per capita income accompanied by rising population. These broad changes are expected to drive the transformation in consumption patterns overtime. However, there is lack of evidence on how food expenditure patterns have changed among households in urban and rural Zambia. Failure to recognize these changes may have led to the mismatch between agricultural policies and the changing consumer preferences. The over-emphasis of policy on maize in Zambia could also be a result of the failure to understand that household food expenditure patterns are changing. Changing consumption patterns holds great prospects for rural development through the creation of rural-urban linkages. However, these prospects have been underexploited.

Against this background, this study sought to understand the changing food expenditure patterns in Zambia and the implications of this transformation on food policy, food market development, and rural development.

The study had the following objectives:

1) To discuss the main determinants of food expenditure patterns among Zambia's households;
2) To determine how household food expenditure patterns have changed over the years; and
3) To examine how food expenditure patterns varies between rural and urban households and across different income groups.

The main source of data for the study was the Living Conditions Monitoring Survey (LCMS) data collected in 1996, 1998, 2010, and 2015 by the Central Statistical Office (CSO) of Zambia. Comparisons of expenditure shares were done for each of the food categories discussed above across the different years. Comparison of expenditure shares was also done between rural and urban areas. The analysis of expenditure patterns of households was conducted in order to determine changes in consumption patterns using the LCMS datasets of 1996, 1998, 2010, and 2015.

The expenditure share of each food item out of total food expenditure (expressed as a percentage) was used as an indicator of consumption. Food items were categorized into the following sub-groups: food groups, commodity groups, and level of processing. To examine the variation in expenditure patterns across the different income groups, households were further grouped into four quartiles groups. Income elasticity of food expenditures were computed for the main food commodity items to examine the responsiveness of expenditure to income growth.

Study Findings

1. A review of the main trends in drivers of consumption showed that while Zambia's per capita income had grown between 1996 and 2015, there was a rise in income inequality. Further there were huge disparities between urban households, which experienced income growth and rural households, which experienced a drop in per capita income.

2. The study finds that there have been major declines in the shares of food expenditure on maize among rural and urban households between 1996 and 2015. Corresponding to the drop in maize expenditure shares, urban households showed a significant increase in wheat expenditure shares while rural households reduced the share of other coarse grains and tubers. Wealthier households spent larger shares of their food expenditure on wheat, rice and potatoes (wheat shares were higher than maize). While poorest households have reduced their share of maize expenditures, they have not sufficiently substituted with other staples in their staple food basket. Hence, the excessive government policy focus on maize is misplaced as it fails to recognize the transformation that has taken place over the years.

3. Transformation of food expenditure patterns is evident mostly among the high income households, mainly in urban areas. Wealthier households increased their share of expenditure on animal foods much more than poorer households. At the same time, poorer households doubled the expenditure share on vegetables. The low share of animal foods in poor household's diets and the doubling vegetables share might imply an increase in undernourishment among poor households mainly in rural areas.

4. Overall the changing pattern of food expenditure is consistent with rising incomes and rapid urbanization. However, the disparities between the different income groups and between rural and urban areas are indicative of the rise in income inequality both in urban and rural parts of Zambia.

5. Fish remains the major source of proteins among poor households whose expenditure share has remained quite high in both rural and urban areas as well as across income groups. By contrast, the shares of beef and dairy products in households' food budgets have fallen even among the wealthier households, while the shares of poultry and eggs have experienced growth in rural and urban as well across all income groups.

6. There has been an increase in the expenditure shares of perishable and processed food in both rural and urban areas, which presents opportunities in agro-processing horticultural and fresh produce sub-sectors.

Study Recommendations:

1. Government needs to reduce its excessive focus on maize and encourage diversification in food production systems including the production various crops such as horticultural products, rice, potatoes and wheat as well as animal production and fish.

2. As a net importer of fish, Zambia needs to strengthen the local production capacity of fish to reduce the deficit through aquaculture development;

3. Government needs to strengthen the urban-rural linkages and resolve the marketing constraints that impede rural producers.

4. There is need for policies that encourage private sector to invest in agricultural value chains and be able to respond effectively to changing demand patterns in urban and rural areas.

TABLE OF CONTENT

LIST OF TABLES

LIST OF FIGURES

ACRONYMS

CSO	Central Statistical Office
FISP	Farmer Input Support Programme
FRA	Food Reserve Agency
GDP	Gross Domestic Product
IAPRI	Indaba Agricultural Policy Research Institute
K	Kwacha
kg	kilogram
LCMS	Living Conditions Monitoring Survey
ml	milliliter
OLS	Ordinary Least Squares
SIDA	Swedish International Development Agency
UCS	Urban Consumption Survey
USAID	United States Agency for International Development

1. INTRODUCTION

Zambia, like many other African countries is going through a period of population growth, rapid urbanization and rising per capita income (Tschirley, Haggblade, and Reardon 2013; Chauvin, Mulangu, and Porto 2012; Hassen et al. 2016). While these changes have taken place, it is not clear whether food expenditure patterns have changed among households in urban and rural Zambia. This has a number of implications for food policies, food markets, rural development, and the nutrition health status of the population.

Failure to understand the changing consumption patterns in Zambia has led to a disjoint between food policies and changes in food preferences that may be taking place. For example, the Zambian government has been pushing for increased maize production through policies such as the Farmer Input Support Programme (FISP) and through the Food Reserve Agency (FRA) disregarding the role of other key staples such as rice, cassava, and wheat in households' diets. Another facet of the policy disconnect is that farming households remain maize-centric, and fail to respond to changes in demand patterns. Thus, it is difficult to attain diversification in food production and consumption without recognizing changes in consumption patterns in urban and rural Zambia. As some stakeholders have noted "…whilst the agro-ecological zones are favorable to growing other food crops such as cassava, Irish and sweet potatoes, including rice, maize has continued to have a dominant effect on the agricultural system, consumption patterns and on the national economy" (Sichilimo 2016).

Changing food expenditure patterns have important implications for rural development through opportunities created for the rural economy. Rapid urbanization and changes in consumption patterns can increase demand for agricultural produce from rural areas thus creating urban-rural linkages in the form of expanded markets for various crops and livestock products, development of input markets, and increased utilization of rural produce through agro-processing as urban populations demand for processed foods increases (Tschirley, Haggblade, and Reardon 2013).

Lack of evidence on dietary transformation, therefore, can result in missed opportunities for rural areas to change their food production systems. Against this backdrop, this study seeks to understand the changing expenditure patterns in Zambia and the implications of this transformation on food policy, food market development, and rural development.

The main objectives of the study were as follows:
1) To discuss the main determinants of food expenditure among Zambia's households;
2) To determine how household food expenditure patterns have changed over the years; and
3) To examine how food expenditure patterns varies between rural and urban households and across different income groups.

Following this introduction, the rest of the paper is organized as follows: Section 2 discusses the data and methods used in the study. In section 3, the paper reviews the main drivers of food of food expenditure and trends in the drivers of consumption in the Zambian context. The main findings of the study are presented in section 4. Finally, the paper makes conclusions and policy recommendations in section 5.

2. DATA AND METHODS

2.1. Data and Data Sources

The main source of data for the study was the Living Conditions Monitoring Survey (LCMS) data collected in 1996, 1998, 2010, and 2015 by the Central Statistical Office (CSO) of Zambia. The LCMS datasets are nationally representative survey data collected over time, and contain among other variables, expenditures on food items. The LCMS serve as the official source for national poverty statistics. The sample size in each of the LCMS datasets used in the study was as follows: 1996 (11,961 households); 1998 (16,443 households); 2010 (19,313 households); and 2015 (12,251 households).

2.2. Methods

Studies that have examined food expenditure patterns often disaggregate consumption (usually measured by expenditure shares in the total food basket) into categories in order to conduct more detailed analysis of changes in consumption patterns. The standard procedure for the aggregation of food items consists of grouping together items that are close substitutes in consumption (Tschirley, Haggblade, and Reardon 2013; Cirera and Masset 2010; Chauvin, Mulangu, and Porto 2012; Hassen et al. 2016). Other studies have gone further to examine calories consumed per capita and the associated expenditures expressed in real terms (Hassen et al. 2016). However, data on expenditure shares are more readily available compared to actual caloric intake at household level. Further, a good number of studies on consumption studies take interest in exploring the disparities between rural areas and urban areas by disaggregating food expenditure or expenditure shares by rural and urban areas. Greater insight into the effects of income on expenditure is gained by further disaggregating food expenditure data into expenditure quintiles. Comparing the differences in expenditure patterns between well off and poorer households is often indicative of how transformation of food systems will shape food economies in the country (Hassen et al. 2016).

Following Tshirley, Haggblade, and Reardon 2013, the analysis of expenditure patterns of households was conducted in order to determine changes in consumption patterns using the LCMS datasets of 1996, 1998, 2010, and 2015. The expenditure share of each food item out of total food expenditure (expressed as a percentage) was used as an indicator of consumption. Food items were categorized into the following sub-groups: food groups, commodity groups, and level of processing.

i)   Main commodity item: This included the main commodities making up the food items (for example maize is the main commodity in maize meal and wheat is the main commodity in bread). A total of 24 commodity items were identified, as shown in Table 1 below.

ii) Food groups: each food item was appropriately group into one of the groups: a) starchy staples such as maize and cassava; b) pulses such as groundnuts; c) fruits and vegetables such as oranges and cabbage; d) animal foods such as meat, milk, eggs, and fish; e) beverages such as tea, coffee, and munkoyo; and f) other food not classified in any of the main categories.

iii) Level of processing and perishability: Food items were grouped according to the amount of processing and perishability (the extent to which the item can be stored). Under this, the food was grouped into: non-perishable unprocessed; non-perishable low processed; non-perishable high processed; perishable unprocessed; perishable

Table 1. Main Commodity Food Items

1.	Rice	13.	Beef
2.	Maize	14.	Other meat
3.	Wheat	15.	Fish
4.	Other cereals (e.g., millet and sorghum)	16.	Dairy products
5.	Cassava	17.	Poultry
6.	Potatoes	18.	Eggs
7.	Other tubers (e.g., sweet potatoes)	19.	Sugar and sweets
8.	Pulses	20.	Spices
9.	Oil crops	21.	Non-alcoholic beverages
10.	Vegetable oils and animal fats	22.	Alcoholic beverages
11.	Vegetables	23.	Food consumed away from home
12.	Fruits	24.	Other food

Source: Authors.

low processed; and perishable high processed. Food items were firstly identified as non-perishable (i.e., food items with a long shelf life such a maize grains or wheat), and perishable (i.e., food items with short shelf life such as fruits, vegetables, fresh meat, and fish). The food items were then identified by the processing level (i.e., unprocessed (e.g., whole maize grains, cassava, sweat potatoes, rice), processed which was further broken down into low processing category, which is processing that involves less value addition and such a maize meal and high processing which involves much value addition such as breakfast cereals, beverages, and sugar.

Comparisons of expenditure shares were done for each of the food categories discussed above across the different years. Comparison of expenditure shares was also done between rural and urban areas. To examine the variation in expenditure patterns across the different income groups, households were further grouped into 4 quartiles groups. Total household expenditure quartiles is used as a proxy for income groups similar to Hichaambwa et al. (2009) where expenditure terciles were used in a study on urban consumption and expenditure in Zambia.

To assess the responsiveness of expenditure to changes in income, income elasticity of food expenditure were computed. This statistic measures the percentage change in food expenditure, in response to a one-percentage increase in income (Wilde 1989). The Engel curve represents the relationship between household expenditure e_i on item and household income, y_i. In this function, price is assumed to be independent of y_i and the relationship between e_i and y_i reflects changes in the quantity purchased in response to a change in y_i while holding prices fixed (Gale and Huang 2007).

The following relationship between expenditure on food items was estimated using Ordinary Least Squares (OLS):

$$e_i = \eta_i y_i + \varepsilon_i \tag{1}$$

Where: e_i is the expenditure on food commodity item i; y_i is the income for the household measures by the total expenditure on all food and non-food items a proxy; and η_i is the income elasticity of expenditure on food item i. Using the LCMS datasets of 1996, 1998,

2010, and 2015, equation (1) was estimated for 25 food items and seven food groups for each year. From equation (1), income elasticity of food expenditure was estimated as follows:

$$\eta_i = \frac{\partial \ln e_i}{\partial \ln yi} \tag{2}$$

Where η_i is as defined already, $\ln e_i$ is the natural logarithm of expenditure on food item i and $\ln y_i$ is the natural logarithm of income for the household using total expenditure on all food and non-food items as the proxy for income.

3. DRIVERS OF EXPENDITURE PATTERNS

This section discusses the drivers of expenditure patterns drawing from literature and trends in each of the identified drivers. This will inform our subsequent analysis of on the patterns of food expenditure over time.

3.1. The Main Determinants of Changing Food Expenditure Patterns

In literature, the main drivers of the changing consumption patterns are growth in income, population, and urbanization (Tschirley, Haggblade, and Reardon 2013; Wilde 1989; Hichaambwa 2009; Hassen et al. 2016; Cirera and Masset 2010). In theory, income has been known to influence food expenditure patterns giving rise to the establishment of two fundamental laws in economics. Lorenz Engel, a German economist, proposed the economic *law* that the share of income spent on food falls as income rises. Another economist, M.K. Bennett proposed what is termed Bennett's Law, which stipulates that the proportion of starchy staples in the diet also decreases with increasing income. Both propositions have been widely tested and in most cases confirmed. As income grows, consumers choose to spend it on foods that are more desirable. Cereals become less important and the share of high-value crops, such as fruits and vegetables, dairy and animal products, and fish, in the food expenditure basket increases (Wilde 1989; Hassen et al. 2016). As incomes grow, change in household expenditure patterns varies depending on the elasticity associated with a particular food commodity. Intuitively, this income elasticity of demand reflects whether a commodity is a necessity or a luxury, as well as a reflection of households' consumption tastes and preferences (Cirera and Masset 2010).

Urbanization is another important driver of expenditure patterns. "Urbanization refers to a rising share of urban population in total population; a country is urbanizing if year-over-year a larger share of its population is living in urban rather than rural areas" (Tschirley, Haggblade, and Reardon 2013). As cities grow in size and number, national food expenditure patterns increasingly reflect the dietary behavior of urban consumers (Wilde 1989). The combination of per capita income growth and urbanization rate can result in dramatic changes in consumption patterns. Rising incomes and urbanization results in households eating more fresh perishable and more processed foods. This, together with the growth in numbers of people, delivers explosive growth in some types of foods (meat, dairy, some fresh produce items, wheat and wheat products, and many new highly processed items) and slow growth or even decline in others (maize and other coarse grains, roots, and tubers), and vast increases over time in the total amount of food that the system has to produce, process, and distribute (Tschirley, Haggblade, and Reardon 2013).

3.2. Trends in the Main Drivers of Food Expenditure in Zambia

In order to contextualize expenditure patterns in Zambia, a brief review of the main drivers, namely population, urbanization, and income is undertaken in this section.

3.2.1. Population Growth

High population growth rate affects consumption and expenditure patterns in that there is growth in aggregate demand for food with increasing population growth. Figure 1 shows the

Figure 1. Zambia's Population Growth
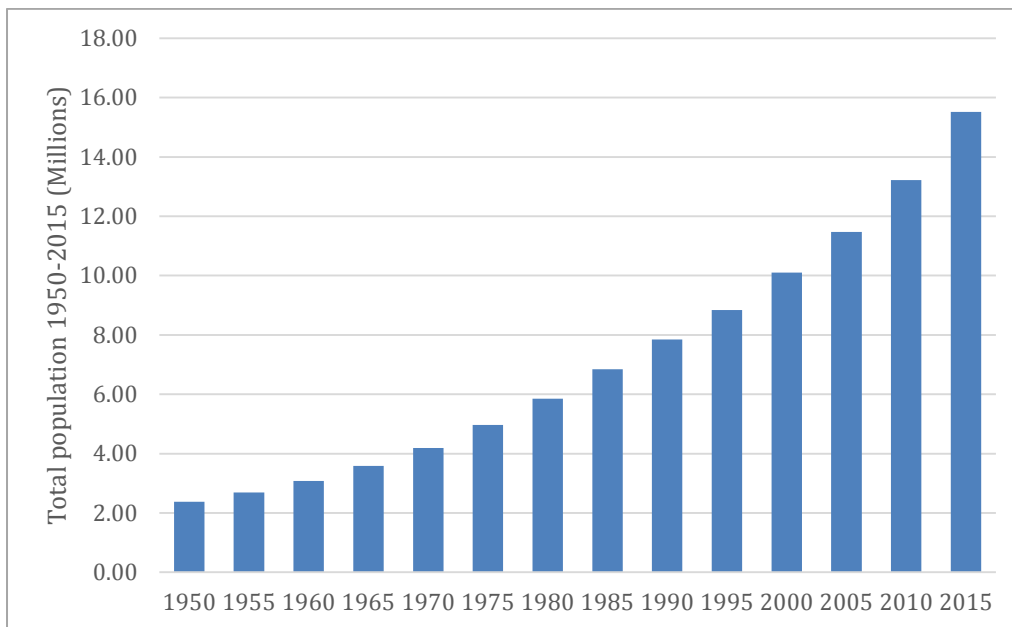
population growth for Zambia between 1950 and 2015. The population of Zambia has increased rapidly from two million people in 1950 to 15.5 million people in 2015.

3.2.2. Urbanization

Urbanization growth rate affects consumption and expenditure patterns in that as urban areas grow in proportion, national food expenditure patterns increasingly reflects the nutritional behavior of urban consumers (Wilde 1989). Figure 2 shows the urbanization rate, which is the growth rate of the population in rural and urban areas.
Although there have been variations in the patterns of urban and rural growth rates over the years, compared to its neighbors Zambia has been highly urbanized for several decades and there has been further sustained growth in the urban population relative to rural areas since 2000. Zambia's urban population in 2015 stood at 40.9% compared to the Sub-Saharan Africa

Figure 2. Zambia Population Growth Rate in Urban and Rural Areas
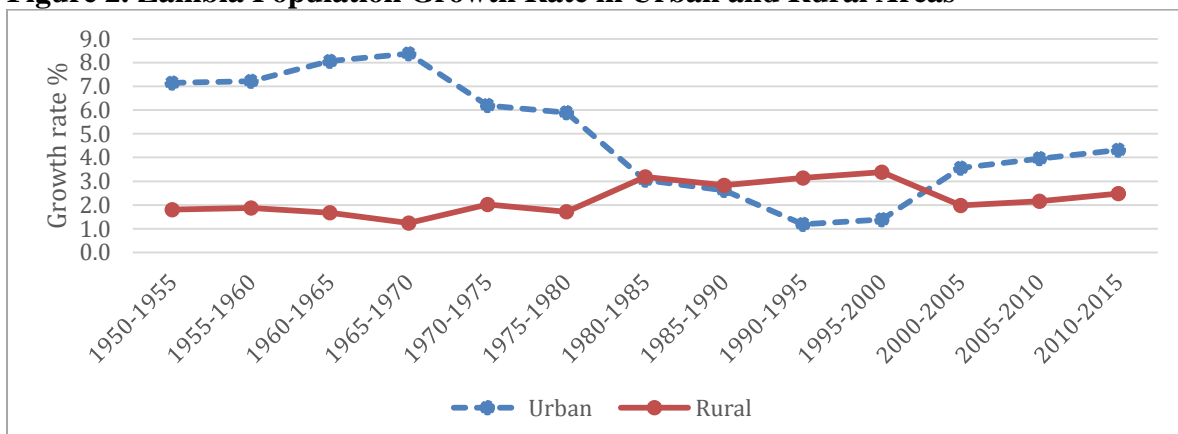
average at 37.9 %. The high level of urbanization has lead to an expansion of supermarkets in most urban areas. Over the last 10 years, supermarkets have influenced the way urban consumers procure food items and the types of foods consumed, by offering a wider range of grocery retail products at relatively cheaper prices, given economies of scale and global sourcing strategies (Das Nair and Chisoro 2015). The market share of supermarket purchases, however, still remains relatively low as compared to the traditional and informal market outlets (Tschirley, Haggblade, and Reardon 2013).

3.2.3. Per Capita Income Growth

High per capita income growth implies that households' purchasing power increases and therefore, they demand more nutritious and diversified diets. Zambia's GDP per capita has grown significantly from around $800 per annum in 1990 to around $1,000 per annum by 2014 (World Bank 2014). While GDP per capita shows that income levels have increased in Zambia over the years, this measure hides the inequalities that may exist in the distribution of income. Thus, it is necessary to look at per capita income based on survey data, which also shows per capita income in rural and urban areas. In addition to this, income distribution measures using the Gini Coefficient and poverty rates are imperative.

Drawing from survey data, Table 2 shows per capita income, Gini Coefficient and poverty rates for the period 1996 to 2015 in rural and urban areas. Inflation adjusted per capita income (2010 constant prices) increased from K273 to K308 between 1996 and 2015 (13% increase). Urban households experienced growth in real per capita income which rose from K461 in 1996 to K553 in 2015 (20% increase). By contrast, rural households experienced a drop in real per capita income from K171 to K129 over the period (25% decrease).Over the entire sample Zambia experienced growth in per capita income, however, this income growth was more concentrated in urban areas as there was a reduction in real per capita income in rural areas.

Between 1996 and 2015, the Gini Coefficient[1] over the entire sample increased from 0.61 in 1996 to 0.69, which means that income inequality increased over the period. Income inequality worsened in both rural and urban areas with the higher inequality experienced urban than in rural areas.

Overall, national poverty declined from 78% in 1996 to 54% in 2015. Urban poverty decreased tremendously from 60% in 1996 to 23% in 2015, while rural poverty declined moderately from 89% in 1996 to 77% in 2015. The trends in poverty augment the finding that per capita income growth has been concentrated in urban areas. However, the higher inequality especially in urban areas indicates a widening gap in the standards of living by households in the different income groups.

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[1] The Gini Coefficient helps our understanding the equality of income distribution in the population. This measures household income distribution using an index of inequality, which ranges from 0 to 1. A coefficient of 0 represents total equality in income distribution, while a coefficient of 1 represents total inequality (CSO 2012).

Table 2. Per Capita Income, Gini Coefficient, and Poverty Rates: 1996 to 2015

Year	Rural/urban	Real monthly per capita income (2010 constant prices) ZMW	Gini Coefficient	Poverty Rate (%)
1996	Rural	171	0.56	89
	Urban	461	0.59	60
	Total	273	0.61	78
2004	Rural	156	0.55	78
	Urban	364	0.5	53
	Total	238	0.57	68
2006	Rural	125	0.66	80
	Urban	430	0.54	30
	Total	235	0.60	63
2010	Rural	158	0.60	78
	Urban	470	0.60	28
	Total	269	0.65	61
2015	Rural	129	0.60	77
	Urban	553	0.61	23
	Total	308	0.69	54
Full period	Rural	148	0.59	80
	Urban	456	0.57	39
	Total	265	0.62	65

Source: CSO 1996, 2005, 2012, and 2016.

4. STUDY FINDINGS

The study findings are presented by first showing the household expenditure patterns of the main food groups as categorized based on the individual food items, followed by the level of processing and perishability. Then the expenditure pattern on the main food items are presented to give more insight into the patterns observed in the food groups. Finally, the income elasticities of food expenditure are also discussed.

4.1. Household Food Expenditure Patterns on the Main Food Groups

In order to observe consumption patterns on the main food groups, the food commodity items were categorized into six main food groups, namely starchy staples; pulses; vegetables and fruits; meat, milk, eggs and fish; beverages; and others. Figure 3 shows the percent of total expenditure on food that is spent on the various categories of food. Starchy staples, which constituted 41% of household's food expenditure in 1996, showed a decline in 2015 to 28%. The expenditure share of vegetables and fruits on the other hand exhibited a marked increase from 14% in 1996 to 26% in 2015. The share of meat, milk, eggs, and fish in households' total food expenditure increased moderately from 25% in 1996 to 29%. There were minimal changes in the expenditure shares of pulses while the share of beverages declined over the period.

In general, the above patterns of expenditure are in agreement with Bennett's law as the expenditure shares on starch in Zambia have fallen, while the share on other more nutritious foods such as meat and vegetables have increased. Nevertheless, there are salient differences in the patterns of expenditure by households in rural and urban areas. Note, for example, that per capita income dropped among rural households, meaning that their increased share of vegetable expenditure is an indication of declining per capita income.

Figure 3. Household Food Expenditure Share on Food Groups
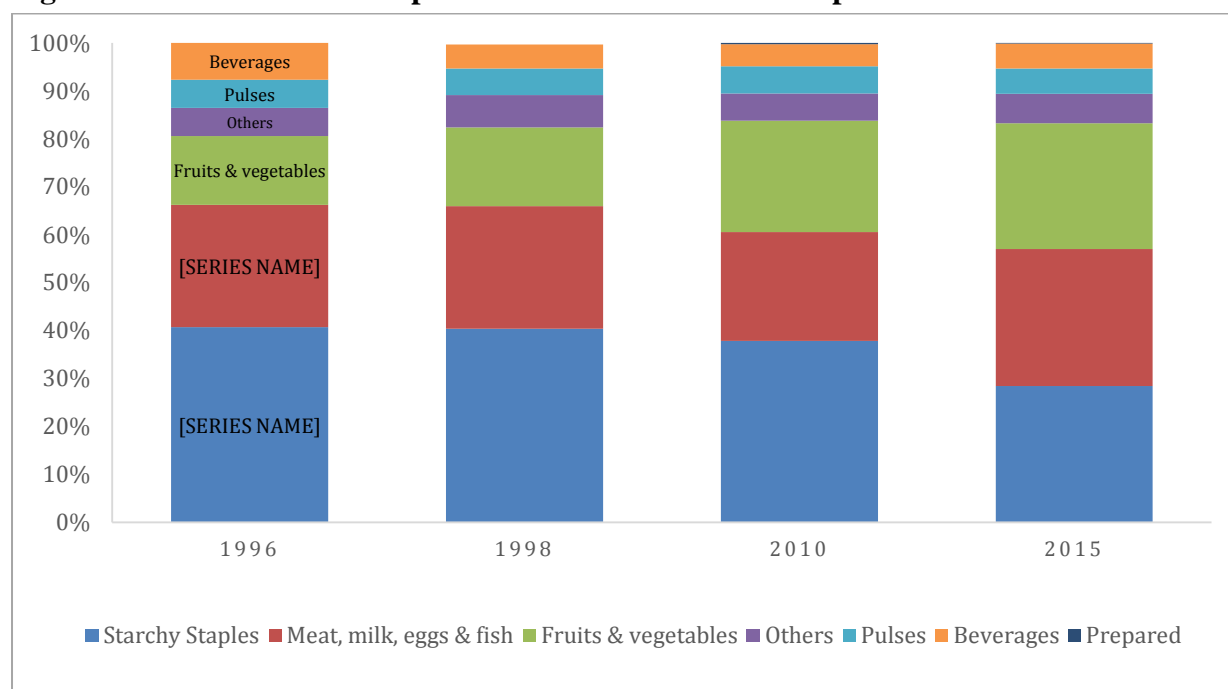
Source: Authors' computation from CSO 1996, 1998, 2010, and 2015.

Figure 4 shows expenditures shares on different food groups disaggregated by rural and urban. Rural households experienced a considerable drop in the share of their food expenditure going to starchy staples between 1996 and 2015 from 45% to 29% respectively than urban households who experienced moderate drop from 33% to 28%. Meanwhile, the share of vegetables and fruits in rural households' food expenditure rose substantially from 13% to 29% over the same period. In urban areas, the increase in vegetables and fruits was more modest.

Urban households experienced a larger increase in meat, milk, eggs and fish expenditure share compared to rural areas. While average per capita income declined among rural households between 1996 and 2015, there was a corresponding decline in the starchy staples' share in rural household's food expenditure as well as significant increase in vegetables and fruits and a moderate increase in animal food. The increase in vegetable expenditure over animal food for the rural households may be due to the decline in per capita income among the rural households.

To further observe the effects of income on the expenditure patterns of the food groups, households were categorized into expenditure/income groups and their expenditure shares determined over the study period as summarized in Table 3. The lowest income quartile households experienced and significant drop in the share of their food expenditure on starchy staples from 49% to 28% between 1996 and 2015. At the same time, these households' share of food budget spent on vegetables more than doubled from 14% to 32%, while meat, milk, fish, and eggs increased less dramatically from 21% to 25%.

Figure 4. Rural and Urban Household's Expenditure Shares on Different Food Groups
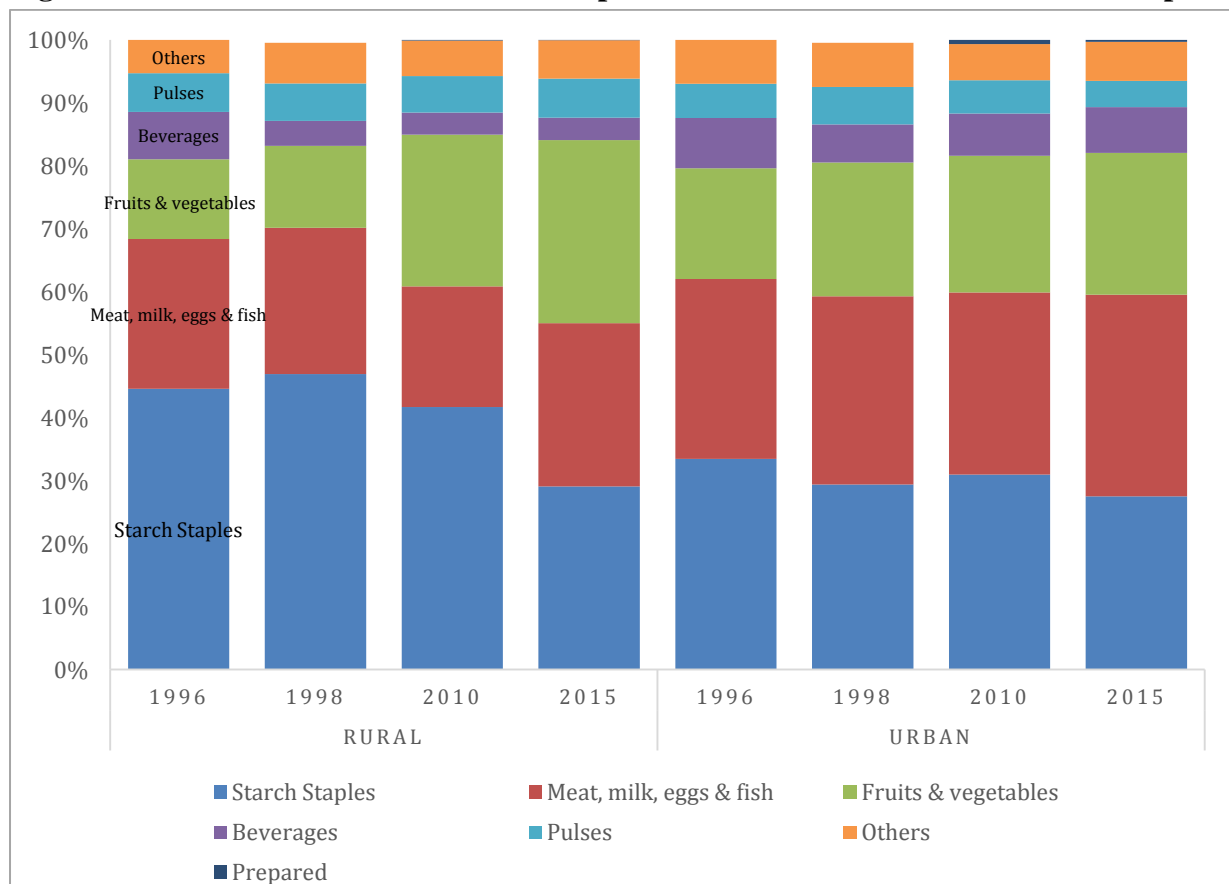
Source: Authors' computation from CSO 1996, 1998, 2010, and 2015.

Table 3. Proportion of Food Budgets Spent on Each Food Group by Income (Expenditure) Quartiles

		Starchy staples %	Pulses %	Vegetables and fruits %	Meat, milk, fish and eggs %	Beverages %	Others %
Quartile 1 (Bottom 25%)	1996	49	6	14	21	5	5
	1998	53	3	14	19	2	8
	2010	48	6	15	20	3	8
	2015	28	5	32	25	3	7
Quartile 2	1996	40	6	14	25	8	6
	1998	43	6	16	24	4	7
	2010	38	6	17	27	4	7
	2015	30	6	27	26	4	6
Quartile 3	1996	36	6	15	28	9	7
	1998	35	7	17	27	5	6
	2010	32	6	19	33	4	6
	2015	29	6	24	30	6	6
Quartile 4 (Top 25%)	1996	31	5	14	32	11	6
	1998	25	7	18	35	9	5
	2010	28	5	17	39	5	6
	2015	25	5	19	35	9	6

Source: Authors' computation from CSO 1996, 1998, 2010, and 2015.

The highest income quartiles experienced a less dramatic transformation over the period 1996 and 2015. The period saw a drop in the expenditure shares on starchy staples, a moderate increase in the shares on vegetable and considerably larger increase in the expenditure share meat, milk, eggs and fish.

4.2. Household Food Expenditure Shares by Level of Processing and Perishability

Figure 5 shows expenditure shares by level of processing and perishability. The expenditure share of non-perishable un-processed foods reduced from 32% and 10% between 1996 and 2015, while there was a significant increase in perishable un-processed food over the same period. There was not much change in the expenditure shares of perishable processed and non-perishable highly processed food remained the same over the period.

Figure 6 shows the rural and urban households' expenditure shares by level of processing and perishability. There was a consistent drop in both urban and rural areas in the expenditure shares of unprocessed non-perishable foods from 41% to 13% between 1996 and 2015 in rural areas and 16% to 5% in urban areas. During the same period, there was a remarkable increase in the expenditure shares of perishable, low processed food in both rural and urban areas. However, while there was an increase in the expenditure shares of perishable unprocessed foods in rural areas, these foods experienced a decline in urban areas.

Figure 5. Food Expenditure Shares by Level of Processing/Perishability
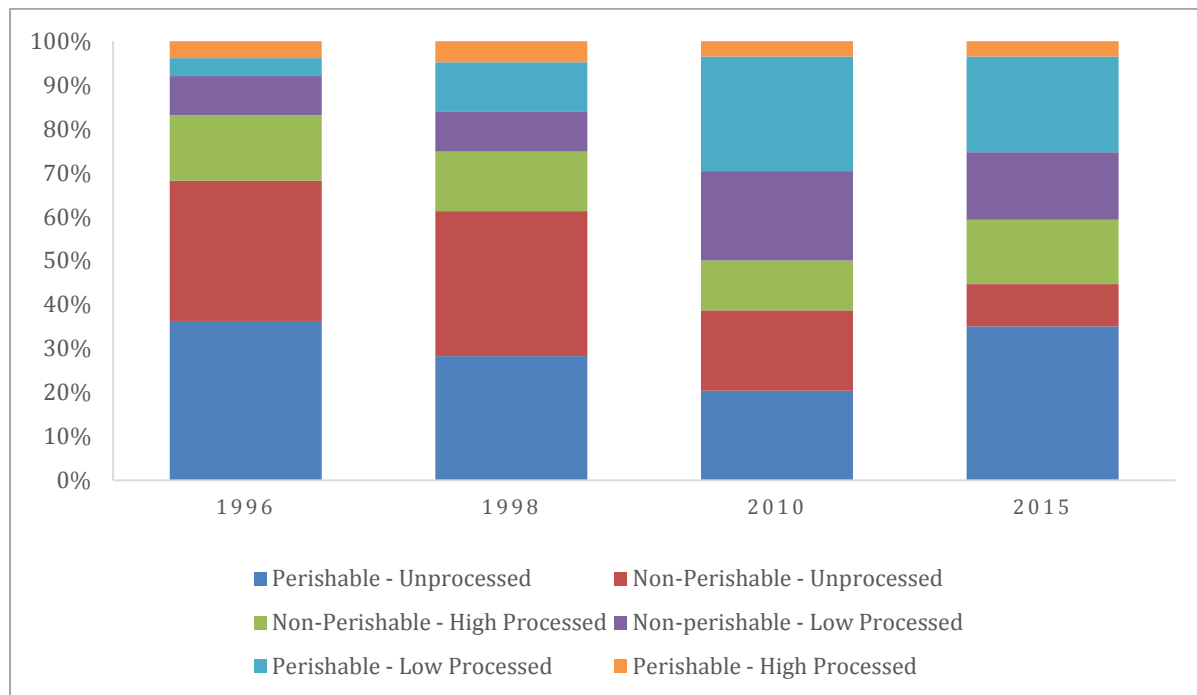
Source: Authors' computation from CSO 1996, 1998, 2010, and 2015.

Figure 6. Rural and Urban Food Expenditure Shares by Level of Processing/ Perishability

Source: Authors' computation from CSO 1996, 1998, 2010, and 2015.

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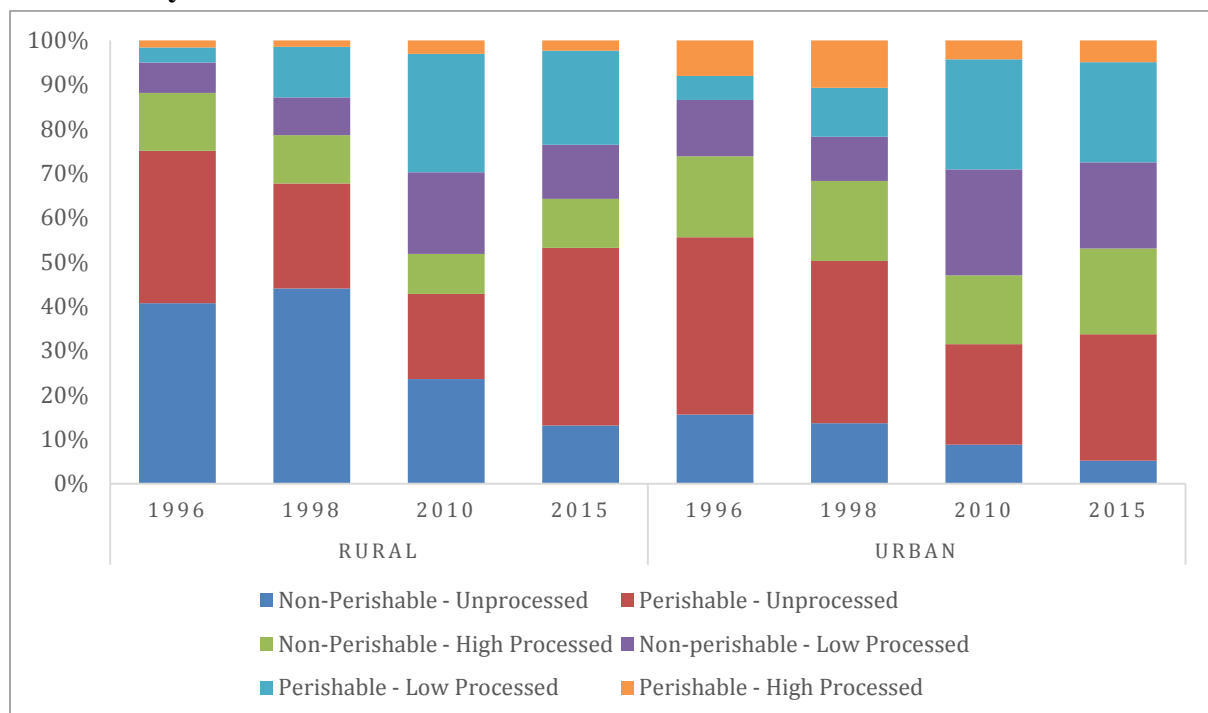
Figure 7. Expenditure Shares on Processed and Unprocessed Food
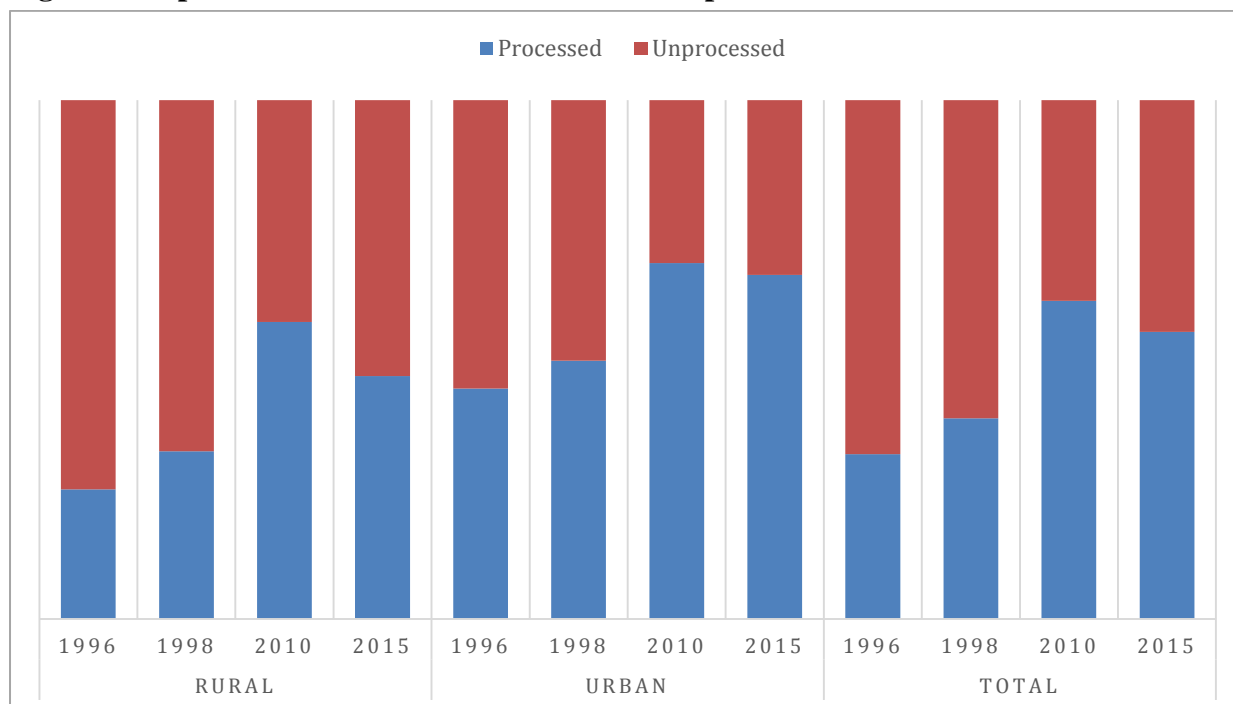
Source: Authors' computation from CSO 1996, 1998, 2010, and 2015.

Figure 7 shows the shares of total food expenditure on processed versus unprocessed food. Both rural and urban households experienced a significant rise in the share of their expenditures spent on processed food between 1996 and 2015. Larger expenditure shares are observed in urban than rural areas.

4.3. Household Expenditure Patterns on the Main Commodity Groups

To get more insight on what is driving the changes in expenditure in the different food groups, the percentage share of the total food expenditure on the main constituent food items was determined. Table 4 shows the proportion of household food budgets spent on each of the commodity groups in Zambia for the periods 1996, 1998, 2010, and 2015. The share of household food budgets spent on maize has significantly reduced from 23% in 1996 to 14% in 2015. On the other hand, the share of food budgets spent on wheat increased from 4 % to 6% while the share of rice and potatoes remained the constant. The budget shares of other cereals such as millet and sorghum, cassava, and other tubers reduced significantly over the same period, explaining the reduction in the starchy staples food group. Household's expenditure shares of pulses such as groundnuts reduced slightly from 6% to 5%. The budget share of food spent on vegetables increased from 11% in 1996 to 20% in 2015. The beef expenditure share of total food budgets dropped from 6% to 3% over the same period, while the share of expenditure on other meat types increased. The share of fish has remained high over the period and increased slightly from 11% to 12%. Poultry budget shares increased from 5% to 7%. The share of food budgets spent on dairy products declined slightly and at the same time, the share of eggs increased slightly. These increases in the budget share of poultry and eggs explains the increases in the meat, milk, fish, and eggs food group.

Table 4. Proportion of Food Budgets Spent on Each Commodity Group

		1996 (%)	1998 (%)	2010 (%)	2015 (%)
1.	Rice	1.8	1.78	1.96	1.98
2.	Maize	23.36	23.23	22.27	13.93
3.	Wheat	3.84	4.83	5.27	6.48
4.	Other Cereals (e.g., Millet and Sorghum)	3.44	1.79	0.82	0.37
5.	Cassava	5.09	7.95	5.75	2.81
6.	Potatoes	0.53	0.55	0.7	0.89
7.	Other Tubers (e.g., Sweet potatoes)	2.67	0.25	1.06	1.96
8.	Pulses	5.89	5.56	5.47	5.21
9.	Oil Crops	0	0	0.13	0.07
10.	Vegetable Oils and Animal Fats	2.6	2.79	4.49	5.13
11.	Vegetables	11.09	11.55	15.88	19.66
12.	Fruits	0.68	1.66	2.86	1.45
13.	Beef	5.98	3.27	2.45	2.98
14.	Other Meat	0	4.48	2.4	2.1
15.	Fish	11.47	9.68	9.26	12.47
16.	Dairy Products	1.93	2.12	1.58	1.36
17.	Poultry	4.63	4.57	5.6	7.47
18.	Eggs	1.44	1.45	1.39	2.18
19.	Sugar and Sweets	4.6	4.86	4.23	4.49
20.	Spices	1.26	1.78	1.47	1.62
21.	Non-Alcoholic Beverages	2.36	0.64	2.71	3.39
22.	Alcoholic Beverages	5.32	3.93	1.95	1.79
23.	Food consumed away from home	0	0	0.27	0.15
24.	Other food	0	0	0.01	0.02

Source: Authors' computation from CSO 1996, 1998, 2010, and 2015.

In order to determine whether the changes in the percentage share of budgets spent on each commodity is due to changes in consumption patterns or changes in prices, Table 5 shows the real (inflation adjusted) prices between 1996 and 2015. The prices of cereals especially maize products show a significant decline. Among the animal proteins, beef prices remained constant while the rest of the animal proteins declined, except for kapenta (sardines), which increased. Milk and cooking oil prices declined; however, egg prices recorded a slight increase. All the fruits and vegetables showed a decline, except sweet potato leaves, which show a marginal price increase. Overall, there are variations in the way prices changed between 1996 and 2015 for different commodities; however, the general picture is that prices of most food items dropped in real term over this period. This is also supported by the drop in the national annual inflation rate from 43% in 1996 to 10% in 2015 (CSO various years).

The implication is that prices alone are not the major determinant of expenditure shares because while some prices declined, households increased the share of expenditure on certain items and vice versa. Changes in consumption patterns as incomes changed over the period also played a role in the observed changes in expenditure patterns.

Table 5. Real Prices of Selected Food Items

Food Items	Unit	Real (2015) Food Price per unit in ZMK			
		1996	1998	2010	2015
Breakfast mealie meal	25 kg	163.41	169.41	86.11	72.94
Roller mealie meal	25 kg	134.79	148.42	61.59	51.58
Maize grain	20 liter tin (17 kg)	53.03	68.76	30.78	30.20
Hammer milling charge	20 liter tin	6.24	17.59	4.25	4.60
Rice	kg	17.30	15.52	-	9.71
Wheat flour	3 kg	18.26	16.72	25.11	19.14
Cassava meal	1kg	8.35	7.87	5.75	5.07
Irish potatoes	1 kg	11.15	10.34	5.92	5.75
Sweet potatoes	1 kg	5.74	6.00	2.15	2.65
Millet	5 liter tin	23.57	8.16	13.76	15.82
Sorghum	each	35.73	8.06	16.20	17.39
Dried beans	1 kg	19.14	20.89	12.13	13.57
Beef (Mixed Cut)	1 kg	28.89	27.75	-	28.32
Pork Chops	1 kg	42.81	46.10	-	30.71
Chicken (frozen)	1 kg	54.77	50.46	-	19.46
Fish (frozen)	1 kg	39.43	30.30	-	23.19
Dried Kapenta (sardines)	1 kg	100.16	100.35	-	110.25
Fresh Milk	500 mls	6.38	6.19	-	4.39
Eggs	1 unit (10 eggs)	28.36	22.90	-	29.44
Cooking oil	2.5-3 liters	99.94	95.54	-	40.85
Oranges	1 kg	10.35	13.34	6.87	7.90
Tomatoes	1 kg	10.43	8.42	5.05	5.74
Onion	1 kg	17.68	12.67	8.79	9.43
Rape (Kale)	1 kg	6.24	17.59	4.25	4.00
Sweet potato leaves	1 kg	6.87	6.26	3.82	7.00
Sugar	2 kg	30.27	22.31	-	19.04
Tea bags	each	16.81	-	-	8.66

Source: CSO various years.
Note: some food prices for 1998 and 2010 were not collected.

The expenditure share of each of the commodity items was disaggregated by rural and urban. Table 6 shows the proportion food budgets spent on each commodity group by rural and urban areas. The expenditure shares of maize have been consistently higher for rural than urban areas over the period. In 1996, the share of maize in rural areas was 26% while in urban areas it stood at 18%. By 2015, the share of maize in rural budgets declined to 16%, while it also declined to 12% in urban areas. The share of rice has remained the constant in both urban and rural areas. The share of wheat increased in both rural and urban areas, i.e., 2% and 8% in rural and urban areas respectively in 1996 and rose to 4% and 10% in rural and urban areas respectively in 2015. The expenditure share of cassava has been much higher in rural areas and has recorded a significant drop especially in urban areas. The budget share of potatoes has remained low in urban and rural areas. The share of vegetables increased in both urban and rural areas between 1996 and 2015, with rural areas recording a higher share than

Table 6. Proportion of Food Budgets Spent on Each Commodity Groups by Rural and Urban

		1996 (%)		1998 (%)		2010 (%)		2015 (%)	
		Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
1.	Rice	1.30	2.76	1.30	2.62	1.29	3.14	1.26	2.92
2.	Maize	26.01	18.41	28.90	13.25	25.78	16.03	15.61	11.75
3.	Wheat	1.60	8.03	1.49	10.71	3.23	8.89	3.83	9.89
4.	Other Cereals	5.09	0.35	2.69	0.19	1.22	0.11	0.61	0.04
5.	Cassava	7.49	0.59	11.79	1.18	8.63	0.63	4.70	0.37
6.	Potatoes	0.30	0.97	0.16	1.23	0.36	1.29	0.58	1.30
7.	Vegetables	10.32	12.53	9.49	15.17	17.33	13.28	23.07	15.24
8.	Fruits	0.53	0.95	1.82	1.37	2.68	3.17	1.03	2.00
9.	Beef	4.95	7.92	1.60	6.21	1.52	4.12	1.88	4.40
10.	Other Meat	0.00	0.00	6.07	1.68	2.54	2.15	2.63	1.41
11.	Fish	11.51	11.39	9.28	10.40	8.47	10.66	12.70	12.17
12.	Dairy Products	1.37	2.97	1.39	3.41	1.12	2.41	1.00	1.84
13.	Poultry	4.85	4.22	4.01	5.5	4.72	7.18	6.16	9.16
14.	Eggs	1.13	2.04	0.91	2.39	0.83	2.39	1.54	3.02

Source: Authors' computation from CSO 1996, 1998, 2010, and 2015.

in urban areas by 2015. The share of beef dropped in both urban and rural areas, with urban areas accounting for a higher share of beef expenditure shares. Rural areas, however, accounted for a higher share of other meat types than urban areas. These include small livestock such as goats, pigs, and sheep among others. The share of fish has been higher in rural than in urban areas while the share of poultry was significantly higher in urban areas by 2015. The expenditure shares of dairy products and eggs have been higher in urban than in rural areas and yet the increase over the period has not been that high.

Table 7 shows the proportion of food budgets spent on each commodity groups by income (expenditure) groups. Quartile 1 constitutes the bottom 25% income group and quartile 4, the top 25% group. For the bottom 25% income group, maize constituted the highest share of household expenditure in 1996. For the top 25% income group, maize consistently accounted for a smaller share of the food budget i.e., 15% in 1996 and 9% in 2015. By 2015, wheat accounted for a larger share of the food budget for the top 25% income households than maize. The expenditure of rice and potatoes has been consistently higher among the high-income households throughout the period and these higher income households have increased the share of their expenditure on these commodities. This finding is similar to what Hichaambwa et al. (2009) found where wheat (and not maize) had the biggest expenditure share among staples in Lusaka, followed by maize and rice. Cassava, other tubers and other cereals such as millet and sorghum have been predominantly consumed by low income households throughout the period and the shares among the higher income households has even declined further.

By 2015, vegetables accounted for the largest share of food expenditure for the bottom 25% income group followed by maize. Vegetables increasingly constituted higher budget shares among the lower income households compared to the higher income households such that by 2015 the bottom 25% income group spent 26% of their food budgets on vegetables compared to 11% for high-income households.

Table 7. Proportion of Food Budgets Spent on Each Commodity Groups by Income (Expenditure) Groups

	1996				1998				2010				2015			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Rice	0.97	1.59	2.42	2.97	1.26	1.56	2.16	2.38	0.62	1.56	2.97	4.13	0.75	1.34	2.67	3.63
Maize	30.52	22.96	19.85	14.63	33.15	25.88	19.38	9.86	28.97	23.65	18.47	10.83	16.60	16.29	12.82	8.50
Wheat	0.80	2.80	5.62	9.04	1.39	4.52	7.33	7.34	1.94	4.47	7.90	10.16	2.89	5.56	8.72	9.62
Cassava	8.32	5.61	2.86	0.86	14.93	7.92	4.21	2.18	9.89	6.12	2.40	0.91	4.94	3.47	1.70	0.46
Potatoes	0.24	0.38	0.70	1.14	0.12	0.38	0.74	1.17	0.23	0.49	0.97	1.69	0.39	0.59	0.97	1.89
Other Tubers	2.54	3.13	2.78	2.09	0.15	0.20	0.27	0.45	1.09	1.23	1.02	0.76	2.19	2.56	1.86	0.98
Vegetables	12.28	10.80	10.68	9.75	10.03	11.57	12.52	12.60	19.88	16.63	12.98	10.00	26.42	21.34	17.09	11.50
Fruits	0.38	0.56	0.75	1.34	1.56	1.79	1.56	1.76	2.20	2.87	3.25	3.71	0.56	0.99	1.72	2.95
Beef	4.11	5.58	6.53	9.51	1.59	2.56	3.97	5.80	1.02	1.96	3.09	5.49	1.56	2.03	3.31	5.77
Other Meat	0.00	0.00	0.00	0.00	1.64	3.37	4.48	10.04	1.94	2.61	2.68	2.63	2.28	1.89	2.04	2.21
Fish	10.78	12.62	12.19	10.10	11.12	10.09	9.34	7.47	8.08	9.16	10.31	10.49	13.94	12.05	12.01	11.64
Dairy Products	1.07	1.39	2.31	3.94	1.05	1.53	2.59	3.90	0.68	1.15	2.15	3.51	0.62	0.85	1.52	2.88
Poultry	3.72	4.56	4.82	6.25	3.02	4.72	5.06	6.05	3.54	5.61	6.59	8.63	5.40	7.12	8.55	9.35
Eggs	0.88	1.27	1.76	2.38	0.69	1.48	1.91	1.96	0.59	1.17	2.03	2.59	1.31	2.15	2.59	2.89

Source: Authors' computation from CSO 1996, 1998, 2010, and 2015.

Beef share of household's food budgets is significantly higher among the top 25% households over the period. In 2015, the share of other meats was similar in both urban and rural areas. The share of fish increased over the period especially among the bottom 25%, accounting for 14% of their total food expenditure compared to 12% for the top 25% by 2015. Poultry shares have been consistently higher for the high-income households and the share of poultry increased significantly by 2015. Dairy products and eggs have also been higher among the higher income households over the period.

4.4. Income Elasticities of Food Expenditure

Income elasticities of expenditure shows the responsiveness of expenditure on each commodity item to an increase in income. Table 8 shows the income elasticities of expenditure for food groups over the period 1996 to 2015. The income elasticity of starchy staples declined over the period indicating that as income rises (as seen by the high per capita income), household demand less starchy foods. However, the demand for more high value food such as meat, milk, eggs, and fish has increased. There has also been an appreciable increase in the income elasticity of beverages. The income elasticity of fruits and vegetables declined marginally, while the elasticity of meat, milk, fish, and eggs showed an increase.

Table 9 summarizes the income elasticities of expenditure for the individual food items for the periods 1996, 1998, 2010, and 2015. The elasticity for maize is quite low and has decreased between 2010 and 2015 reflecting low expenditure increase on maize as incomes grow. In comparison rice, wheat and potatoes have had higher income elasticities of expenditure meaning that growth in income results in increased household expenditures on these items. Income elasticities of food expenditure on other cereals such as sorghum and millets as well as cassava are negative, implying a reduction in expenditures as household incomes rise. The elasticity of other tubers such as sweet potatoes is low and has declined over the period but they have been positive.

Pulses, oil crops, vegetable oils and animal fats (edible oils) all have positive elasticities. There was a marginal increase in the expenditure elasticities for pulses over the period. Similarly, the expenditure elasticity for oil crops shows a slight increase and so does the elasticity of edible oils.

Table 8. Income Elasticities of Expenditure for Food Groups

		Year			
	Food Group	1996	1998	2010	2015
1.	Starchy staples	0.72	0.54	0.40	0.39
2.	Pulses	0.29	0.40	0.51	0.38
3.	Fruits and vegetables	0.46	0.67	0.43	0.42
4.	Meat, milk, eggs and fish	0.53	1.52	0.66	0.67
5.	Beverages	0.64	0.81	0.91	1.30
6.	*Prepared Foods	-	-	1.17	0.89
7.	Others	0.33	0.53	0.45	0.49

Source: Authors.
*Note: Data on prepared foods was not collected in 1996 and 1998.

Table 9. Income Elasticities of Expenditure for Commodity Items

		Year			
		1996	1998	2010	2015
1.	Rice	0.48	0.71	1.26	0.59
2.	Maize	0.82	0.19	0.22	0.21
3.	Wheat	1.40	0.48	0.65	0.59
4.	other cereals	-0.19	0.05	-0.19	-0.08
5.	Cassava	-0.13	-0.11	-0.24	-0.13
6.	Potatoes	0.68	0.93	1.52	0.91
7.	Other tubers	0.20	0.26	0.29	0.14
8.	Pulses	0.29	0.25	0.52	0.38
9.	Oil crops	-	-	0.32	0.50
10.	Vegetable Oils and Animal Fats	0.32	0.93	0.41	0.42
11.	Staple vegetables	0.47	0.34	0.49	0.37
12.	Other vegetables	-	-	0.28	0.23
13.	Fruits	0.92	0.53	0.72	1.96
14.	Beef	0.78	0.70	2.12	1.03
15.	Other Meat	-	-0.23	0.61	0.76
16.	Fish	0.32	0.44	0.46	0.46
17.	Dairy Products	0.60	0.76	1.13	1.71
18.	Poultry	0.58	0.71	0.64	0.55
19.	Eggs	0.59	0.58	0.55	0.58
20.	Sugar and Sweets	0.36	0.60	0.41	0.44
21.	Spices	0.13	0.26	0.61	0.46
22.	Non-Alcoholic Beverages	1.13	2.56	0.84	1.33
23.	Alcoholic Beverages	0.49	0.22	1.04	1.43
24.	Food consumed away from home	-	-	1.17	3.78
25.	Other Foods	-	-	1.67	-0.85

Source: Authors' computation from CSO 1996, 1998, 2010, and 2015.

Staple vegetables such as tomato, onion, and green leafy vegetables have positive elasticity; however, this has declined over the years. In comparison, other vegetables including traditional vegetables have a lower elasticity of expenditure. Fruits on the other hand have a much higher elasticity of expenditure, which was greater than one by 2015.

The expenditure elasticity of beef was less than one in 1996 and 1998 but rose above one in 2010 and 2015. Similar to beef, the expenditure elasticity of dairy products increased substantially by 2015. The rising beef and dairy expenditure elasticities shows that these items have associated with income households over the years. There is also a rise in the elasticity for other meat types; however, these elasticities are lower than beef. The fish expenditure elasticities have been more consistent, increasingly only marginally since 1996. Fish expenditure has been less responsive to income changes over time than other sources of animal protein, meaning that even lower households can afford it. The expenditure elasticity of poultry has been low over the years and shows a marginal decline by 2015. Eggs also show a similar trend with poultry products. Food consumed away from home shows the highest expenditure elasticity among all commodity items. Alcoholic and non-alcoholic expenditures also exhibit high expenditure elasticities. Expenditure on these items is associated with high incomes.

5. CONCLUSIONS

Zambia experienced per capita income growth and rapid urbanization between 1996 and 2015. However, this period was also characterized by rising income inequality. The share of household's food expenditure on maize has declined substantially over the years, while other staples such as wheat are becoming important in peoples diets. Thus, excessive policy focus on maize is misplaced as it fails to recognize the transformation that has taken place over the years. There have been major declines in the expenditure shares of other coarse grains such as millet and sorghum and tubers such as cassava and sweet potatoes in both rural and urban areas. While these patterns could be a result of changing preferences as per capita income grows and in some cases prices, maize centric policies seem to have also played a role. Thus, Zambia's agricultural policies have failed to recognize that consumption patterns have changed over time.

Thus, the beginnings of dietary transformation in Zambia are evident from the reduction in households' expenditure shares on staple foods and the increase in the share of other foods. More work will be needed to see how changes in expenditures translate into dietary changes within households, and on to affect the nutrition of the population. However, there are major variations between urban and rural households as well as across the different income groups, an indication of growing income inequality as well as the concentration of income growth among urban households.

The transformation in food expenditure patterns is more evident among high-income households. Among these households, the composition of staples in their food expenditure have transformed substantially by substituting maize with other staples such as wheat, rice and potatoes to the extent that by the year 2015, the share of wheat in food budgets exceeded maize. Poorer households have lagged behind in the transformation, and their reduction in maize shares of food expenditures has not been accompanied by a significant increase in the share of other staples.

The increased prominence of vegetable expenditures among the poor, especially in rural areas, may be indicative of increases in quantities consumed, but may equally be an indicator of higher prices for this food group. Combined with our findings on the low share of nutritious animal foods in low-income food expenditures, this raises concerns over the nutritional quality of diets in poor households, especially in rural areas.

Fish remains the major animal-source food among poor households whose expenditure share has remained quite high in both rural and urban areas as well as across income groups. By contrast, the shares of beef and dairy products in households' food budgets have fallen even among the wealthier households, while the shares of poultry and eggs have experienced growth in rural and urban as well across all income groups. There has also been an increase in the expenditure shares of perishable and processed food in both rural and urban areas, which presents opportunities in agro-processing horticultural and fresh produce sub-sectors.

In line with the findings above, income elasticity of expenditure results indicate that households' expenditure on maize does not increase in response to an increase in income. Households actually reduce expenditure on cassava, sorghum, and millet in response to income growth. However, households' expenditures are more responsive towards wheat, potatoes, rice, beef, dairy products, fruits, poultry and eggs, which are some of the most nutritious and aspirational foods. Expenditure on vegetables and pulses, however, are only moderately responsive to growth in per capita income.

6. POLICY RECOMMENDATIONS

- Government needs to reduce its excessive focus on maize and encourage diversification in food production systems in line with changing demand patterns. This should encourage the production various crops such as horticultural products, rice, potatoes and wheat, and livestock such as poultry, small livestock.
- Fish remain the most important source of nutrients from animal foods, especially among poor households. However, Zambia is still a net importer of fish. There is need to strengthen the local production capacity of fish to reduce the deficit through aquaculture development.
- Government needs to strengthen urban-rural linkages by resolving the marketing constraints that impede rural producers. This will allow the rural producers to adequately take advantage of the changing consumption patterns in urban areas. Increased agro-processing and development of fresh produce value chain can link rural producers with urban markets and improve rural incomes.
- There is need for policies that encourage private sector to invest in agricultural value chains and be able to respond effectively to changing demand patterns in urban and rural areas.

ANNEX

Table A1. Proportion of Food Budgets Spent on Each Commodity Groups by Rural and Urban

		1996 (%)		1998 (%)		2010 (%)		2015 (%)	
		Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
1.	Rice	1.30	2.76	1.30	2.62	1.29	3.14	1.26	2.92
2.	Maize	26.01	18.41	28.90	13.25	25.78	16.03	15.61	11.75
3.	Wheat	1.60	8.03	1.49	10.71	3.23	8.89	3.83	9.89
4.	Other Cereals	5.09	0.35	2.69	0.19	1.22	0.11	0.61	0.04
5.	Cassava	7.49	0.59	11.79	1.18	8.63	0.63	4.70	0.37
6.	Potatoes	0.30	0.97	0.16	1.23	0.36	1.29	0.58	1.30
7.	Other Tubers	2.83	2.38	0.28	0.21	1.17	0.89	2.50	1.26
8.	Pulses	6.12	5.46	5.55	5.57	5.60	5.24	6.05	4.12
9.	Oil crops	0.00	0.00	0.00	0.00	0.17	0.04	0.09	0.03
10.	Vegetable Oils and Animal Fats (edible oils)	1.78	4.15	1.71	4.70	4.05	5.28	4.99	5.31
11.	Vegetables	10.32	12.53	9.49	15.17	17.33	13.28	23.07	15.24
12.	Fruits	0.53	0.95	1.82	1.37	2.68	3.17	1.03	2.00
13.	Beef	4.95	7.92	1.60	6.21	1.52	4.12	1.88	4.40
14.	Other Meat	0.00	0.00	6.07	1.68	2.54	2.15	2.63	1.41
15.	Fish	11.51	11.39	9.28	10.40	8.47	10.66	12.70	12.17
16.	Dairy Products	1.37	2.97	1.39	3.41	1.12	2.41	1.00	1.84
17.	Poultry	4.85	4.22	4.01	5.5	4.72	7.18	6.16	9.16
18.	Eggs	1.13	2.04	0.91	2.39	0.83	2.39	1.54	3.02
19.	Sugar and Sweets	3.78	6.14	4.12	6.16	3.96	4.70	4.03	5.08
20.	Spices	1.51	0.79	2.33	0.82	1.72	1.04	2.03	1.08
21.	Non-Alcoholic Beverages	2.53	2.05	0.24	1.33	1.98	4.01	2.25	4.88
22.	Alcoholic Beverages	5.01	5.91	3.49	4.70	1.54	2.69	1.34	2.39
23.	Food consumed away from home	0.00	0.00	0.00	0.00	0.06	0.64	0.03	0.29
24.	Other food	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.03

Source: Authors' computation from CSO 1996, 1998, 2010, and 2015.

Table A2. Proportion of Food Budgets Spent on Each Commodity Groups by Income (Expenditure) Groups

	1996				1998				2010				2015			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Rice	0.97	1.59	2.42	2.97	1.26	1.56	2.16	2.38	0.62	1.56	2.97	4.13	0.75	1.34	2.67	3.63
Maize	30.52	22.96	19.85	14.63	33.15	25.88	19.38	9.86	28.97	23.65	18.47	10.83	16.60	16.29	12.82	8.50
Wheat	0.80	2.80	5.62	9.04	1.39	4.52	7.33	7.34	1.94	4.47	7.90	10.16	2.89	5.56	8.72	9.62
Other Cereals	5.99	3.38	1.80	0.67	2.21	2.28	1.23	1.17	1.39	0.86	0.42	0.10	0.70	0.37	0.24	0.07
Cassava	8.32	5.61	2.86	0.86	14.93	7.92	4.21	2.18	9.89	6.12	2.40	0.91	4.94	3.47	1.70	0.46
Potatoes	0.24	0.38	0.70	1.14	0.12	0.38	0.74	1.17	0.23	0.49	0.97	1.69	0.39	0.59	0.97	1.89
Other Tubers	2.54	3.13	2.78	2.09	0.15	0.20	0.27	0.45	1.09	1.23	1.02	0.76	2.19	2.56	1.86	0.98
Pulses (w/ groundnuts)	5.95	6.19	6.07	5.09	3.02	5.60	7.28	7.20	5.11	6.07	5.70	4.85	4.69	5.93	5.41	4.67
Nuts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.01	0.01	0.05	0.07	0.07	0.01
Oil Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.14	0.19	0.08	0.02	0.06	0.06	0.16
Vegetable Oils & Animal Fats	1.53	2.79	3.42	3.35	1.93	2.97	3.36	3.16	4.06	4.39	5.00	4.88	5.51	5.03	5.03	4.87
Staple Vegetables	12.28	10.80	10.68	9.75	10.03	11.57	12.52	12.60	3.82	5.03	5.59	5.14	8.22	7.64	6.73	5.39
Other Vegetables	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.06	11.60	7.38	4.86	18.20	13.70	10.36	6.11
Fruits	0.38	0.56	0.75	1.34	1.56	1.79	1.56	1.76	2.20	2.87	3.25	3.71	0.56	0.99	1.72	2.95
Plantains	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Beef	4.11	5.58	6.53	9.51	1.59	2.56	3.97	5.80	1.02	1.96	3.09	5.49	1.56	2.03	3.31	5.77
Other Meat	0.00	0.00	0.00	0.00	1.64	3.37	4.48	10.04	1.94	2.61	2.68	2.63	2.28	1.89	2.04	2.21
Aquatic Products	10.78	12.62	12.19	10.10	11.12	10.09	9.34	7.47	8.08	9.16	10.31	10.49	13.94	12.05	12.01	11.64
Dairy Products	1.07	1.39	2.31	3.94	1.05	1.53	2.59	3.90	0.68	1.15	2.15	3.51	0.62	0.85	1.52	2.88
Poultry	3.72	4.56	4.82	6.25	3.02	4.72	5.06	6.05	3.54	5.61	6.59	8.63	5.40	7.12	8.55	9.35
Eggs	0.88	1.27	1.76	2.38	0.69	1.48	1.91	1.96	0.59	1.17	2.03	2.59	1.31	2.15	2.59	2.89
Sugar and Sweets	2.95	5.06	5.68	5.73	4.21	5.36	5.28	4.67	3.80	4.29	4.65	4.46	3.68	4.54	4.86	5.03
Spices	1.90	1.21	0.88	0.57	3.61	1.44	0.90	0.58	2.09	1.33	1.00	1.05	2.84	1.41	1.02	1.00
Non-Alcoholic Beverages	1.14	2.35	3.12	3.80	0.16	0.37	0.73	1.57	1.45	2.11	3.63	5.18	1.51	2.76	3.87	6.22
Alcoholic Beverages	3.93	5.77	5.73	6.80	1.94	3.17	4.33	7.31	1.29	2.01	2.22	2.90	1.14	1.50	1.74	3.15
Food Consumed Away From Home	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.09	0.37	0.92	0.01	0.05	0.13	0.49
Other Foods	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.04	0.01	0.02	0.01	0.05

Source: Authors' computation from CSO 1996, 1998, 2010, and 2015.

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