FOOD PRICE EFFECTS ON DIETARY INTAKE OF PRE-PRIMARY CHILDREN IN LOW INCOME HOUSEHOLDS IN ELDORET, UASIN GISHU COUNTY, KENYA

BY

JANE WAHU

A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF DEGREE OF MASTERS OF SCIENCE IN COMMUNITY NUTRITION, UNIVERSITY OF ELDORET, KENYA

JULY, 2023

DECLARATION

Declaration by the Candidate

This thesis is my original work and has not been presented for a degree in any other university. No part of this thesis may be reproduced without the prior written permission of the author and/or the University of Eldoret.

Wahu Jane

_____ _____

PGF/AGR/09/2009 **Date**

Declaration by the Supervisors

This thesis has been submitted for examination with our approval as the university supervisors.

_____ _____

Professor Violet Kadenyeka Mugalavai **Date**

Department of Family and Consumer Sciences

University of Eldoret, Eldoret, Kenya.

_____ _____

Dr. Paul Okelo Odwori **Date**

Department of Applied Economics

University of Eldoret, Eldoret, Kenya.

DEDICATION

This work is dedicated to my husband Peter and our children Kathy, Vicky and Baraka for their prayers, encouragement and patience during the execution of the work. I also dedicate it to my late father Kimani and my mothers, Leah and Lucy, who sacrificed their all to raise me.

ABSTRACT

Unpredictable fluctuations in food prices have a direct impact on household's real income. High and volatile prices of food raise malnutrition through both substitution of food commodities and income effects on consumption. When food prices increase people often shift from more costly foods to cheap foods which may be of less nutrition value to compensate for reduced income. Children in these households are immediate victims of such adjustments. The study sought to determine the food price effects on dietary intake of pre-primary children in low-income peri- urban households in Eldoret, Uasin Gishu County.

The study was descriptive survey research by design conducted in Eldoret, Uasin Gishu County. Theory of Planned Behaviour and Consumer Theory informed the study. A sample size of 399 low-income households was targeted, cluster, stratified and random sampling techniques were used to select 399 low-income households with pre-primary children, using Taro Yamane (1973) formula.

Data was collected using researcher administered questionnaires to the caregivers. Data collected was analysed using Statistical Package for Social Sciences (SPSS) computer software version 23, for the dietary intake of pre-primary children in low-income households. The study employed descriptive techniques to understand the current dietary trends in the region. Chi-square test established relationships between food prices and dietary intake and diversity. The study findings showed that there was a statistically significant relationship between increased food prices and dietary diversity score of households with pre-primary children (10, N=399) = 28.448, p=.002). The findings showed that there was a weak relationship between dietary diversity and education level of caregivers (r=0.184, p=0.002 which is less than 0.05). Majority of pre-primary children in these low-income households had three meals in a day with the cereal group being the highest consumed. Most households had a medium dietary diversity score. They adopted different coping strategies such as eating less preferred foods. The findings indicated a significant link between food accessibility for utilization and minimum dietary diversity (8, N=399) =26.32, p=0.013). The study concludes that food prices affect the dietary intake of pre-primary children in low-income households. The study recommends that the government should protect the populace against hunger by giving money monthly to low-income household. Stakeholders to adopt multiple ways to improve food security and dietary intake of low-income households. The government should enforce the existing policies that protect consumers against unpredictable food price spikes.

TABLE CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS, ACRONYMS AND SYMBOLS

FAO Food Agriculture Organization

KFSSG Kenya Food Security Steering Group

NFCS National Food Consumption Survey

NBCS National Budget and Consumption Survey

QFFQ Quantitative Food Frequency Questionnaire

RDA Recommended Dietary Allowances

SDGs Sustainable Development Goals

OECD Organization for Economic Cooperation and Development

NACOSTI National Commission for Science, Technology and Innovation

TPB Theory of Planned Behaviour

OPERATIONAL DEFINITION OF TERMS

Peri-urban households- These comprise of family units whose residence is within areas immediately adjacent to Eldoret, Uasin Gishu county, Kenya i.e., area within a radius of seven kilometres from the town Centre.

Pre-primary Children-These are children aged between four and five years who are in pre-primary 1(PP1) and pre-primary 2 (PP2) in the current Kenyan system of Education (Competency Based Curriculum).

Malnutrition-the physical function of an individual is impaired to the point where she/he can no longer maintain adequately bodily performance processes due to inadequate or excessive intake of food in this state.

Dietary Intake-This is the average daily intake of food.

Dietary Diversity-This is the variety or number of different food groups people eat over the given time.

Price of food- The average price of particular food commodities globally and across countries.

Caregiver- A family member or a paid helper who regularly looks after a child.

Low-income household-for the purpose of this study is a household living on less than the international poverty line (US$1.00 per day).

Coping strategies- The behaviours used by households to adjust to the changes in food prices.

ACKNOWLEDGEMENT

I wish to sincerely thank the Almighty God for enabling me to complete this task through His goodness and abundant grace without which it would have been impossible. I sincerely thank the University of Eldoret, the School of Agriculture and Biotechnology and the Department Family and Consumer for providing me with all the requirements for the course. I also wish to thank my supervisors Professor Mugalavai and Dr Odwori for their time and professional guidance through the study. Special thanks to Dr Serrem for her guidance in the early part of the study. I wish to thank my classmates and friends for their encouragement. Thank you for your support.

CHAPTER ONE

INTRODUCTION

This chapter provides the basis of the study. It discusses the background to the study, statement of the problem, purpose of the study, research objectives, research questions, and scope of the study, significance of the study, theoretical framework and conceptual framework

1.1 Background to the Study

A number of studies have looked at the impact of escalating food prices and their effect on the poor globally. In reviewing the short run poverty impacts of 2010-11 surge in food prices, Wodon et al., (2008) found that poverty rose by 44million people and the poor were likely to be significantly affected.

Food price volatility is the rapid, unpredictable changes in food prices that wreak havoc on market rather than long term structural trends in food prices that we can prepare for and adjust to, United Nation's Food and Agriculture (FAO, 2013). Volatility cuts both ways prices go up and down. Both rapid increases and rapid declines in food prices can create problems. Food prices are a primary determinant of consumption patterns and high food prices have a negative effect on nutritional status and health especially the poor households.

The global food prices shot up nearly 33% in September 2021 compared with the same period the year before. That is according to the United Nations Food and Agricultural Organisation (FAO)'s monthly Food Price Index. It also found out global prices had risen by more than 3% since July 2021. Recently soaring food prices have become a major concern amongst policy makers. For example, the group of 20

developed and leading emerging economies (G20) put the food prices spike and food security at the top of their 2011 agenda (Alem & Söderbom, 2012).Global supply and demand imbalances in agricultural commodity markets appear to have been a main driving factor for this recent increase in food prices. Also, unfavourable weather conditions in important food producing countries and growing world population are other factors of food price volatility. Other factors driving food prices (both on supply and demand sides) are higher energy prices and expansion of biofuel production as suggested by Organization for Economic Cooperation and Development (OECD, 2012).

In particular, high costs of food may curtail household spending for the other essential goods and services, such as health care (Darmon & Drewnowski, 2015). The global recession has seen millions of people the world over suffer because of increased volatile food and fuel prices. Food and Agriculture Organization's report on the availability of food in the world (FAO, IFAD, UNICEF, 2017) focused on high food prices, which were having a serious impact on the poorest populations in the world. Among these populations are people living in African continent.

For example, food availability in Kenya is not satisfactory and for about one-third of its population, the average daily caloric intake availability is below the recommended level of 2,100 Kcal/person/day (KNBS, 2023). In Kenya, 98% of food consumed in urban areas is purchased while 2% is own production (KNBS, 2023). This implies that majority of the urban population obtain food from market or shops. Food price changes have increased levels of food deprivation, while placing tremendous pressure on achieving agreed Sustainable Development Goals of the United Nations. The United Nations General Assembly set these goals in 2017. Goal 2: Zero Hunger, is

geared towards ending hunger, achieve food security and improved nutrition and promote sustainable agriculture. This goal states that by 2030 we should end hunger and all forms of malnutrition.

World prices of wheat, rice and all seed crops continued rising in early 2016. These increases in agricultural commodity prices have been a significant factor driving up the cost of food in local markets, leading to a fuller awareness and justification for heightened concern about food intake in the world, especially for developing countries.

After steadily declining for a decade, world hunger is on the rise affecting 9.9 per cent of the people globally. From 2019 to 2020, the number of malnourished people grew as many as 161 million, a crisis driven largely by conflict, climate change (UNICEF/WHO/WORLD BANK, 2021)) and the covid-19 pandemic.

In Kenya, access to food is a basic necessity and a right as per article 43 (1) (c) of the 2010 Kenyan constitution. However, Kenyans continue to starve as food is either unavailable or they lack financial resources to purchase it. KNBS, (2023) states that the main staple food of Kenya is maize, which accounted for about 65% of total staple food caloric intake and 36% of total food caloric intake. Data from Kenya National Bureau of Statistics show that between February 2021 and February 2022, food prices increased by 8.69% (KNBS, 2022). As Kenya's most consumed meal, the price of maize flour has been fluctuating over time, a 2kg packet of maize flour that retailed at ksh118 in February 2021 rose to ksh129 in February 2022. The government's effort to cushion consumers by subsidizing the cost of maize flour has not borne much fruit.

1.2 Statement of the Problem

As global food prices continue to rise, individuals and families in the developing world may be facing a new food reality. Fluctuations in the price of staple food continue to benefit some household welfare (producers) while hurting others (consumers) (Mkhawani et al., 2016). Volatile food prices can have devastating effects on the food budget of the urban households making it more difficult for them to afford food baskets**.**

Sudden and unexpected increases in food prices force people to adjust quickly. Consumer purchasing power goes down and households are pushed closer or below poverty lines. This is especially true for urban families, rural households. At household and individual level it means that both dietary quality and total energy intake may be reduced compromising child growth and cognitive development increasing the risks of micronutrient deficiencies for all family members (Herforth & Ahmed, 2015). In Kenya, about 26.5% of the population is urban according to the World Bank report (World Bank, 2017). Unfortunately, half of the urban population lives in slum areas. Malnutrition is a major problem, particularly amongst the urban poor of this country. They have no bank account or personal savings; living conditions and education levels are very low according to the Government of Kenya (GoK, 2010). From the greater reliance on cash income and limited access to land for agricultural production, the urban dwellers may be more vulnerable to food price shocks than those in rural areas. At least 3.5 million urban dwellers in Kenyan cities have difficulty meeting their food needs on a regular basis according to Kenya Food Security Steering Group (KFSSG, 2008). The rise in the cost of fuel in November 2017 led to increase in the prices of most food items. Hiked prices of food tend to

affect both low and middle income household budgets. For example, the price of maize flour has been retailing at 115 shillings from the previous 90 shillings per 2/- kilogram packet from August 2017 (Soko Directory, 2017). In Kenya, the price of a 2kg packet maize meal was expected to ease gradually from its retail price of sh153 to sh115 after the zero rating of maize by the National Treasury Cabinet Secretary Draft 2020 Budget Policy (The National Treasury, 2020). The government fixes the price of maize, which affects the price of maize to the Flour Millers, who in turn hike the price of maize flour. Therefore, this study concentrated on the food prices and its effect on the dietary intake of pre-primary children in low-income urban households. It also investigated how households reacted and adjusted to food price changes and evaluated their coping strategies. It is against this background that the study sought to establish the effects of food prices on the dietary intake of pre-primary children in low-income peri-urban households in Eldoret, Uasin Gishu County, Kenya.

1.3 Purpose of the Study

The purpose of the study was to investigate the food price effects on dietary intake of pre-primary children in low-income peri-urban households in Eldoret, Uasin Gishu County, Kenya.

1.4 Objectives

1.4.1 Broad objective

The main objective of this study was to determine the food price effects on dietary intake of pre-primary children in low-income peri- urban households in Eldoret, Uasin Gishu County, Kenya.

1.4.2 Specific objectives

The specific objectives of the study were:

i. To assess the effects of food price on dietary intake of pre-primary children in low-income peri- urban household in Eldoret, Uasin Gishu County, Kenya.

ii. To determine the effects of food price on dietary diversity of pre-primary children in low-income peri-urban households in Eldoret, Uasin Gishu County, Kenya.

iii. To establish the coping strategies towards food price fluctuations in low-income peri-urban households with pre- primary children in Eldoret, Uasin Gishu County, Kenya.

1.5 Research questions

The study sought to answer the following questions:

i. What are the effects of food price on dietary intake of pre-primary children in low-income peri- urban households in Eldoret, Uasin-Gishu County, Kenya?

ii. What are the effects of food price on dietary diversity of pre-primary children in low-income peri-urban households in, Eldoret, Uasin-Gishu County, Kenya?

iii. What are the coping strategies employed by the low-income peri-urban households with pre-primary children towards food price fluctuation in Eldoret, Uasin-Gishu County, Kenya?

1.6 Theoretical Framework

Theory of Planned behaviour (TPB) and the Consumer Theory guided the study. Theory of planned behaviour basis on the assumption that most human behaviour is the result of an individual's intention to undertake a particular behaviour and the ability of an individual to make a conscious decision about it. It links one's beliefs and behaviour. This theory states that attitude towards behaviour (Do I want to do that?), subjective norms (Do other people want me to do that?) and perceived behavioural control (Do I have the ability to do that?) together shapes individuals behavioural intentions and behaviour (Vermeir & Verbeke, 2006)In this theory attitudes involve how one feels and thinks about behaviour. It has negative and positive effects on one's life and behaviour. Subjective norm refers to social pressures, and include both the perceived expectations of others and how much the individual values those expectations while perceived behavioural control is how one feels capable and confident to perform the behaviour. The TPB has been used in other studies to understand people's behaviour to engage in a number of activities including weight loss and engagement with leisure activities (Abelson, et al, (1982), Ajzeb & Timko, (1986). These studies indicate that the application of the TPB deals with attitudes, subjective norms and perceived control; these variables determine intentions and actions. Behavioural intentions and behaviour of an individual are shaped by attitude, subjective norms and perceived behavioural control. For instance, if the behaviour to expect in this study is consumption of a diet that is balanced in the three meals pattern to meet the dietary requirements of pre-primary children in households; the caregiver will consider favourable or unfavourable evaluations of food prices (attitude). Pressure from the family members and friends to consume a balanced diet

(subjective norm) determines the choice of meal for the household. Perceived capability (food budget), is the amount of money that the caregiver is willing to spend on food and confidence to buy the right foods and quantities even when their prices fluctuate and income is constant (perceived behaviour control). When applied to the dietary intake of individuals in low income peri-urban households with pre-primary children, the TPB suggests that intentions to consume the appropriate diet and in the right quantities will be influenced by the attitudes towards good nutrition. Pressure from others to do so, will be influenced by their thoughts about the right dietary intake, good nutrition and if they engage in it. One's capability and confidence to buy the right food and quantities to meet the nutritional needs of household members will be dictated by the price of food and the food budget allocation of the household income.

Consumer Theory analyses how consumers maximize the desirability of their consumption as measured by their preferences subject to limitations on their expenditures, by maximizing utility subject to a consumer budget constraint. The law of demand states that the rate of consumption falls as the price of the good rises, even when the consumer is monetary compensated for the effect of the higher price. As the price of a good rises, consumers will substitute away from that good, choosing more of other alternatives. If no compensation for the price rise occurs, as is usual, then the decline in overall purchasing power due to the price rise leads, for most goods, to a further decline in the quantity demanded. As a way of coping with spiking food prices low income households with pre-primary children have adopted strategies such as decline in purchase of specific foods because they cannot be able to afford high quality food.

1.7 Conceptual Framework

A conceptual framework is a scheme of variables operationalized by the researcher to achieve the set objectives. It enables the translation of the relationship among independent, intervening and dependent variables into a visual picture that shows the inter connection among them

The study used the following conceptual framework to show the relationship between independent variable, and dependent variables also intervening variables.

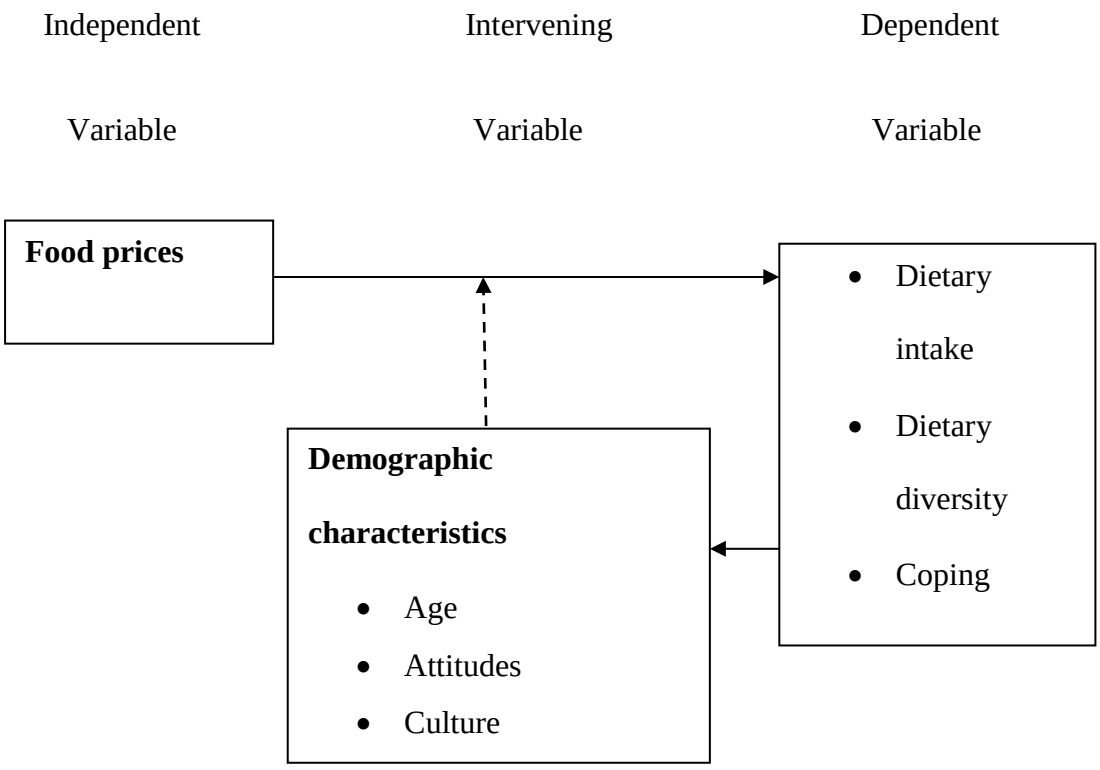

Figure 1:1: Conceptual Framework. Source: Author (2021)

The independent variable is price of food and the dependent variables are namely, dietary intake, dietary diversity and coping strategies. The intervening variable is

demographic characteristics (age, attitudes, culture and gender). The age of the caregiver such as younger maternal age is associated unhealthier dietary intake patterns in children according to (Green et al., 2013). The attitude of the consumer is dictated by the increased awareness among consumers regarding their health and types of food they should take to reduce the risk of lifestyle illnesses. This plays a crucial role in the selection of food consumed the household. Culture also influences consumption of food in a society. It outlines which foods form the household diet. Culture is also a determinant of gender discrimination in intra-household allocation of food with the girls having a lower food intake.

1.8 Scope of the study

The study was conducted in Eldoret town in Uasin Gishu County in Kenya. Eldoret is the largest urban centre in Uasin Gishu County. The study focused on socioeconomic status of low-income peri-urban households with pre-primary children, the dietary intake and dietary diversity among pre-primary children aged between four and five years in these households in Eldoret town, Uasin Gishu was assessed to understand the effects of changing prices of food on the quantity and quality of food consumed. Additionally, the study examined the coping strategies against the changing food prices.

1.9 Significance of the Study

The research findings will help the government of Kenya to review their policies towards the attainment of the first Sustainable Development Goal of eradicating extreme poverty and hunger. The results of the study are expected to assist the government to intervene through food policy to mitigate the effects of food price

volatility. Additionally, the study may also provide useful information and add value to the existing knowledge on dietary intake and nutritional status of pre-primary children in low-income peri urban households since in Kenya little has been done on the same. Non-Governmental Organizations dealing with nutritional intervention programs may use the information to formulate their policies. In addition, community nutritionists may use the study findings to formulate food and nutrition programs regarding to dietary intake. This will influence urban households coping strategies to ensure adequate nutrition in times of food price fluctuation.

Scholars and academicians are expected to identify further areas for research on volatile food prices and their effects on dietary intake and dietary diversity of pre-primary children that would enhance their nutritional status. Academicians will also make references and deductions from the findings and conclusions of the study since it provides additional information to the body of literature in the field of nutrition.

1.10 Limitations of the Study

Kothari, (2004) defines a limitation as some aspect of the study that the researcher knows may negatively affect the generalizability of the results but over which they have no control. They are shortcomings, conditions or influences that cannot be controlled by the researcher and they place restrictions on the methodology and conclusions. The respondents might have felt uneasy to answer questions concerning their diet. The respondent's apathy that there was no direct benefit in giving the right answer to the questions or participating in the study. However, the researcher assured all the participants privacy and confidentiality that the information they provided was for the purpose of the study.

1.11 Assumptions of the Study

The research operated on the following assumptions:

i) The dietary intake of the pre-primary children in low-income peri urban households was balanced throughout the study period.

ii) The respondents were truthful and honest in responding to the questionnaire.

iii) The respondents were able to read and understand the questionnaire.

iv) Other factors that influence dietary intake of pre-primary children in low-income households were held constant throughout the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

In this chapter, a wide range of scholarly, academic and peer-reviewed journal articles were consulted to establish a relationship between food price volatility and dietary intake among urban households. The literature review presents a number of key aspects, which are critical to the study. These include the effect of rising food prices on food consumption patterns among urban households, the relationship between dietary quality and consumption rate of food, the food intake sufficiency index and the nutritional status of household's members. The literature also examined various models, which were highlighted in the various scholarly articles to explain the relationship between food prices and consumption patterns. This provided a framework within which to examine the consumption patterns among urban households in Eldoret. Lastly, it concluded by reflecting on what the study intends to contribute to the efforts of past researchers.

2.2 Effect of Rising Food Prices on Meal Consumption Patterns

The United Nations Food Agriculture Organization (FAO) estimates that nearly 870 Million of the 7.1 billion people in the world were suffering from chronic undernourishment in 2010-2012 and that almost all the hungry people estimated at 852 million live in developing countries and represents 15% of the population of these countries (FAO, 2013). Several scholars have attempted to examine the effect of increasing food prices on the consumption pattern of urban households (Aziz et al., 2016; Matz et al., 2015; Mkhawani et al., 2016). Most of these scholarly works relied

on the variations that exist in the remuneration rate among the members of the households, which is a considered as a function of the expenditure. For example, Pons, (2011) provided a comparison between rural and urban households on how they were left vulnerable to the rising food prices using the elements of demand and elasticity. The results indicated that rural households were significantly affected by the ever-increasing food prices as compared to the urban households. The wealth of the household and the prices of the commodities in the marketplace were key factors irrespective of the fact that they were either urban or rural households. The study noted that there were diverse effects in relations to various commodities, but it failed to clearly elaborate how the ever-increasing food prices affected the consumption patterns of the urban households.

On the other hand, (Kearney, 2010) provided a projection of food consumption pattern up to 2050 highlighting the key drivers from an international perspective. The study attributed the availability of food to increased income levels and ultimately a drop in food prices, which affect the consumption patterns for the last 50 years from his study, he discovered a number of factors could account for the transition in the consumption patterns. These include differences in socio-demographic factors and other consumer characteristics, urbanization and prices agreed by the food industry marketing and the policies of trade liberalization (Kearney, 2010). Beydoun et al., (2011) also examined the possible effects of rising cost of food on the perceptual experience of the populace in South Africa and the adopted method to cope with food insecurity. Using quantitative methods, they discovered a number of findings. The study discovered that 58 percent of the participants had altered their eating habits due to the rising cost of food.

Regarding the methods adopted, the study discovered there were three key methods in which the participants used to cope with the rising food prices. First, 60 per cent of the participants purchased food in large quantities as a short-term strategy to make up for the rising cost of food in the market place. Secondly, 50 per cent preferred the development of their vegetable garden to reduce cost involved. Third, 57 per cent shifted to purchasing cheaper brands available in the market as opposed to the high dietary quality. The study concluded that the rising food prices had adverse effects on the poor households' especially female-headed households.

Matz et al., (2015) also examined the effect of sudden changes in food prices on the urban and rural households in Ethiopia through a quantitative study. The study relied on data from household survey panel and cost data of foodstuff gathered from the marketplace. The results indicated that the increase in food prices was broad, but not specifically linked to households with less quantity of meals. With respect to the urban households, the study discovered that most of the households that were affected with the rising food prices shifted to less preferred and cheaper foods. The study concluded that the rising food prices had a negative aggregate effect on the urban households despite the fact that the households were still able to sustain their basic food consumption.

The study of Alem & Söderbom, (2012) also investigated the impact of rising food prices among urban households in Ethiopia and how it affected food consumption during the period 2000 – 2008. The study discovered that there were food price increases during the years 2004 and 2008 as compared to other years. During the cited years, there were significant adjustments to food consumption because of high food

prices. These changes mainly affected households associated with low-income levels. Alem & Söderbom, (2012)concentrated on the changes in the consumption patterns of food but failed to considered prices of food as one of the key variables. In another study, Headey et al., (2012) critically examined the impact of rising food prices on urban households in Ethiopia with respect to the welfare of the members. The study attempted to elaborate on the effect of rising food prices among low-income individuals living in urban areas and how they responded to the rising food prices. The results indicated that there was a steady decline in the purchase of specific foods because of the rising food prices during the period 2007 – 2008 and 2011. It was noted that there was a decline in the purchasing power associated with casual wages by 20 per cent and an increase in food prices.

Shimeles & Woldemichael, (2014)also elaborated a negative impact of rising food prices on the urban households depicted by the reduced purchasing power of the members. They also discovered that some households especially the rich households were not affected by the rising food prices while the poor urban households were adversely affected. The rich urban households seem to benefit significantly from an increase in food prices as they controlled the market and the setting of food prices. According to Von Braun et al., (2008)rising food prices has been considered to cause social unrest and have adverse effects on food consumption such as increased distress, increased starvation, lower purchasing ability, and perennial poverty. Some immediate responses that are used by the affected households were reduced food consumption, enhanced labour provision to increase income and a decline in saving (FAO, 2013)

Consumption patterns per household have been affected by rising food prices in several ways. According to Capehart & Richardson, (2008), a high percentage of the household's income allocated to purchasing food tend to experience inflation since that the cost of some foodstuffs rise implying that they have to spend more on consumption as previously anticipated. Dubihlela & Sekhampu, (2014)also suggested that the magnitude in which the households are affected by the rising food prices is dependent on percentage of price increase, which in turn affects purchasing ability of a household and consumption patterns. This implies that diverse households are confronted with contrasting rising prices. McGranahan, (2008) also discovered that the households which spend a significant portion of their budget on items associated with rising prices generally are faced with higher inflation as opposed to households that spend their budget on items which are not associated with rising prices. Compton et al., (2010)provided several methods in which the households deal with rising food prices through the adoption of various consumption patterns such as buying less expensive foods that have lower nutritional content, reducing the quantity in meals and sometimes skipping meals.

The rising food prices significantly increase the budget allocated for food among the urban households and low-income households (Levell & Oldfield, 2011). It has been noted that the rising food prices significantly lowers the purchasing ability of a low-income individual and increases the spending decisions of an urban household. There is need for immediate policy response to reduce the impact of rising food prices, enhance accessibility, reduce poverty and hunger, and fortify food security. From the above literature, it can be noted that there have been significant steps, which have been made to address the rising food prices. Regarding the consumption patterns,

most studies have either completely failed to provide an account on how it affects the consumption patterns of the urban household or they provided general results from a national perspective. Therefore, there is need to determine how the rising food prices affect the consumption patterns among the urban populace.

2.3 Dietary quality and consumption rate of food

In trying to understand the actual impact of rising food prices in the dietary quality, it is essential to comprehend the perception of individuals. According to da Costa & Alves, (2015), the perception of dietary quality can be viewed in terms of the weight, body composition and dietary pattern. They further added that the excess weight added over time could be associated with the dietary and life style habits of an individual. They also associated the dietary patterns with eating habits taking into consideration the type of food that is commonly consumed, the number of meals per day and the quantification of nutrient intake (da Costa & Alves, 2015). Darmon & Drewnowski, (2015) specifically acknowledged that the diet quality was not affected by either age or sex of an individual, but the income levels, education qualification and occupation affected diet quality. This was consistent with the findings of Cheng et al., (2016). Herforth & Ahmed, (2015) differed with this when they postulated that dietary quality is affected by two main factors namely, the availability of nutritional foods that can promote health and restraint from foods associated with poor health effects.

Vellakkal et al., (2015) conducted a study in which they examined the relationship between the price indices of fast foods and dietary intakes among research participants drawn from the Continuing Survey of Food Intakes. The results indicate

that there were significant relationships between food prices and urban family income, especially among the young participants. According to Kearney, (2010)there have been drastic changes in the dietary patterns of individuals. These findings are consistent with the uptake of essential foods as well as other diversified diets. In order to comprehend the dietary patterns, it is important to use a nationwide monitoring framework, which can inform the necessary reforms in an individual's dietary intake. Kearney, (2010)further added that this critical information could be used to evaluate the trends in foods, nutrients and consumption rate of food within a sub-populace of interest.

Mkhawani et al. (2016) noted that the rising food prices in the market have adversely affected the poor households since they cannot be able to afford high quality food. Thus, they involuntary resort to inexpensive and less nutritive foods. On the contrary, Matz et al., (2015) discovered that the rising food prices provide no clear link between the diversity of the diet and food consumption among the members of the urban household. Vasantha et al., (2015) critically looked at the elements attributed for the shift in life style trends and discovered that the dynamics in life style patterns is strongly correlated to the dietary patterns of the populace. In addition, they found out that the dynamics in life style patterns caused a health degeneration of the urban populace because of increased non-communicable infections. The results of Popkin, (2006) and Vasantha et al., (2015)were consistent with these findings when they discovered that factors affecting nutrition had declined significantly while diseases such as obesity, diabetes and hyper tension had greatly increase as a result of increased financial costs of the ever-changing trend.

In a separate study, da Costa & Alves, (2015) conducted a study in which they examined the perception of individuals regarding their dietary quality. The results indicated that the participants, who considered their dietary quality as excellent, were from a significantly higher family income as compared to participants who rated their dietary quality as poor. This was despite the fact the family spending among the two groups was quite small.

Darmon & Drewnowski, (2015) also examined the impact of rising food prices and its effects on the dietary cost in relation to the socio-economic disparities in the diet quality. In examining the impact of rising food prices and dietary cost, the study relied on a systematic review of various literatures. The results suggested that foodstuff associated with low nutritional value and low quality diets were less expensive and were generally selected by individuals or households of lower socio-economic status. The research also discovered that there were various quantities of nutrient-dense foods, which were readily accessible at lower price. However, these nutrient-dense foods were considered less edible to the rich households and culturally suitable for the low-income households. Lastly, the research discovered that the acceptable healthier diet for an individual was homogeneously related to higher costs.

Beydoun et al., (2011) studied the impact of fast-food consumption on the dietary quality and the risks associated with it. From the study, various outcomes were obtained. First, they discovered that fast-food industry, which is common in the urban regions, has steadily increased around the global. As a result, the dietary quality and nutritional status of the individual members has significantly declined while food-related diseases such as obesity have increased. Despite the fact that food

consumption rate and its related dietary quality have been relatively scrutinized in literature, the outcomes of this research have not extensively elaborated the comprehension of the foods used urban households. Therefore, the dietary quality and the consumption rate of foods among households in the urban regions require more attention in order to ascertain the healthful state. In addition, a large extent of the literature concerning dietary quality and consumption focus on impact of income levels, the effect on a particular gender, feeding patterns, accessibility to clean water and well-being services, which seem not to change rapidly within a short period (Matz et al., 2015;).

2.4 Coping strategies

According to Wodon et al., (2008), the rising food prices have caused diverse impacts across populace and they have responded in different ways. In terms of how the populace responded, it can be noted that different groups such as the poor, the rich among others adopted different ways. For instance, the poor gradually decrease food consumption and change to less-balanced diets, which are within their income. This response tends to have both short and long-term effect on the health status of the poor populace. Due to the increasing food prices, Mkhawani et al., (2016) suggested that the members of the households drastically reduced the quantity of food intake as a last strategy. This was against that the backdrop of the expected food intake to support the development, protection of the human body from numerous diseases. Darmon & Drewnowski, (2015) suggested that members of low income household adopt a monotonous diet, which is mugged with poor quality, absence of choice, less nutritive foods and highly likely to lead to micronutrient illnesses and disorders.

The poor households spend a large per cent of their income mainly on food, worsening their situation as compared to the rich groups Gustafson, (2013). As more revenue is spent on purchasing foods, there is less money for education and healthcare. This in turn, adversely impact on the quality of education, limits the numerous prospects created from socio-economic development and completely weakens the capability of the poor populace to escape poverty(Clapp, 2017). On the other hand, the rich populace do not inevitably decrease food consumption but reduce their spending on durable items. Wodon et al., (2008)recommended the use of appropriate policy in order to shield the populace against the adverse effects of rising food prices apart from the search of appropriate actions. The policies should take three key dimensions into consideration that is, to decrease domestic prices, effectively promote nutrition status and food production, and promote protection of the populace. However, any attempts to reduce the effects of the rising food prices by the national governments through the use of policies clearly has adverse effects on the savings incentives, on the growth of the economy and the populace cannot gain from them.

2.5 A Comparison of Present and Expected Food Intake Sufficiency Indexes

The rising food prices are anticipated to significantly impact on the food intakes of household's members. The findings from literature are mixed and very few are based on nationally or regional descriptive samples (Beydoun et al., 2011). Food intake sufficiency has widely been used literature and policies, but very few studies have been able to accurately provide a comparison of the expected and the actual food intake sufficiency indexes (Clapp, 2015). Yearbook (2003) defined food intake

sufficiency index in terms of the populace's proportion, which is below the expected level of nourishment. In this case, Yearbook (2003) perceived undernourishment as a status in which the dietary intake of an individual is way below the expected dietary needs to uphold a healthy life and perform various activities to meet their basic needs.

Clapp, (2015) examined food sufficiency in a number of nations during period 2007 – 2008 when there was increased international food crisis and some nations sought to shield themselves from increasing food prices. Clapp, (2015); FAO, IFAD, UNICEF, (2017); FAO, (2013) also perceived food self-sufficiency in terms of the degree at which a nation can meet its food necessities support by its local production. Clapp, (2015) illustrated the relationship between food production and food consumption as shown in Figure 2.1 below. It can be inferred that when food production is equivalent to food consumption; there is 100 per cent food intake sufficiency. In order to fully comprehend the implication of this relationship, there need to come up with a plotting for the individual nations or region under study to determine if they fall above or below the 100 per cent sufficiency plot. If the nation or region falls above the line, it is considered self-sufficient; otherwise, they are considered food deficient.

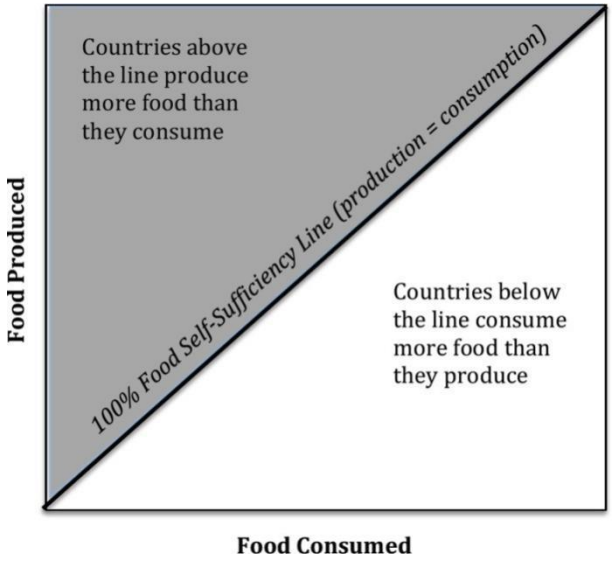

Figure 2:1: A representation of food intake sufficiency
Source: (Clapp, 2015)

In order to provide the expected food intake sufficiency index of an individual, there is need to consider the body size and the physical activity levels of an individual irrespective of their age (Ramachandran, 2013). The revised Recommended Dietary Allowance (RDA) of an individual takes into consideration the present body weight as well as the physical activity to determine the energy and nutrient needs. The rising food prices are expected to increase physical activity in an effort to earn more income and drastically reduce dietary intake.

Napoli et al., (2011)used hunger as a means of determining the ratio of the populace with individual energy consumption that is below the expected nutritional requirements. They suggested hunger to imply a situation when the energy deficiency leads to a reduction in body weight, physical activity. In their study, Napoli et al., (2011), prescribed three main elements in determining the expected food intake sufficiency, namely the amount of income allocated for food, the inequality associated with energy intakes and the nation's energy needs based on sex and the age-group.

There are three main stages which are used in the computation of the expected food intake sufficiency that is; the use of the nation's Food Balance Sheet to measure the calorie intake per person; the measurement of the calorie distribution among the populace; using a calorie cut-off level to estimate the number undernourished individuals.

From the literature, it can be noted that there is no study that has been able provide any significant indexes relating to the food intake sufficiency among urban households. Most of these studies have stressed the need to meet the dietary food intake sufficiency despite the rising food prices. This will also go a long way in supporting the development of a nation. Thus, there is need to provide a comparison of the present and the expected.

2.6 Nutritional status of household members

With the rising food prices, it is expected that the household will find it very difficult to optimally meet the nutritional needs of every member. Various studies have attempted to examine how the rising food prices affect the nutritional status of every household member (Herforth & Ahmed, 2015; Mkhawani et al., 2016; FAO, 2017). Most of these studies have found that the nutritional requirements of each household member are rarely met as most food prices rise. This can also be attributed to the limited income available to purchase the essential foods with the nutritive requirements. According to Mkhawani et al. (2016), the members of the households were affected by the increasing food prices. This forced them to adopt new eating patterns, which was mainly characterized as a monotonous diet. Darmon & Drewnowski (2015) discovered the income allocated for food was insufficient to

ensure that every household's member obtained optimum diet. The monotonous diet is marked with poor quality and absence of choice that is associated with less nutritive foods and more likely to lead to micronutrient illness and disorders.

According to FAO, IFAD, UNICEF, (2017) the nutritional status of each household member is dependent on a number of factors being fulfilled. These factors include the availability of food for the household members to share as per the individual needs, the diversity of food, the value and safety of the food quality and the health status of each household member. Herforth & Ahmed, (2015)suggested that the nutritional status of the household members is significantly improved by an increase in income and decreases with a decline in the income levels. In a separate study, Kearney (2010) discovered that most of the changes in food consumption patterns were attributed to the shift in nutrition. This was result was arrived at by relying on three quantitative sources of data namely the food balance sheets (FBSs), household budget surveys and individual dietary surveys.

For the nutritional needs to be met there is need for both national and sectorial policies and programs to be set (FAO, 2017) that can promote efficient community-based actions, enhance household food security and food consumption that are considered to have sufficient nutritional dietary needs. FAO (2017) suggested that the community-based actions need to happen within a framework, which can promote sustainable livelihoods and provide appropriate solutions to local issues such as malnutrition, the ever-increasing food shortages, increasing food prices, absence of dietary diversity among others.

Schnepf (1992) explored the nutritional status of research participants in a National Budget and Consumption Survey (NBCS) while concentrating on the household consumption patterns. The study also examined numerous factors which affect nutritional status and household food consumption such as the income of the household; the demographic characteristics of each household and subsistence orientation. In the determining the effect of the various factors, the research relied on the regression analysis where the z-score model was used. The results indicated that there were several outcomes, which inform this study. First, the study discovered that household food consumption pattern significantly varied from region to region. The study also discovered that household calorie availability per day that was essential for any adult was more vital as compared to the amount of income spent on food per adult equivalent. This was considered an essential factor in determining the nutritional status per household's member. Thirdly, the research results indicated that an increase in income level was related to an increase in the prices of food, which was bought to be consumed in the urban household.

It can be noted that most studies have provided adverse effects of the rising food prices on nutritional status of each household members through the various methods adopted. For instance, the reduction of meals implies that the body of an individual will actually fail to meet the necessary nutritive requirements. In addition, it was noted that most of these quantitative studies have attempted to examine the nutritional status from national perspective as opposed to a specific region. There is no actual study which has been conducted in Kenya regarding food price effects on dietary intake of pre-primary children. This research could add value to the existing

literature. Thus, this study seeks to examine the effects of food prices on dietary intake and dietary diversity of pre-primary children with respect to Kenya.

2.7 Existing models for rising food prices

Most studies on rising food prices have portrayed its adverse effects and how it has affected the consumption patterns of household, dietary quality, food intake requirements of household's member and the food intake sufficiency. According to Gustafson, (2013), the rising food prices are significantly affected by the market prices and therefore, the rising food prices cannot be examined in isolation. Failure of the demand-supply model and economic model to explain the effects of rising food prices and its dynamics has been attributed to numerous factors affecting food market prices. Food market prices are also affected by various elements such as food availability, income allocated, culture of the residents, customer attitude and the financial markets. Because of the complex inter-linkages and interactions between these critical factors and various aspects of the economy, food prices are not a mere result of farmers' supply and consumers' demand. Thus, this research is informed by the Z-score model to determine the effects of rising food prices on the urban households guided by a number of theoretical models, namely the Food price elasticity (Green et al., 2013). The model is discussed below.

2.7.1 Z-score model

Various scholars have used the z-score model in effort to determine the effects of rising food prices on food consumption patterns and nutritional status (Schnepf, 1992; Vellakkal et al., 2015). The z-score model is based on a weighted normal in which most proportions associated with coefficient values are determined. Although not

predefined rates have been provided for evaluating consumption patterns and nutritional status of an individual, there are certain food requirements, which must be met to living a healthy lifestyle. Thus, z-score model examines various independents variables and its effects on rising food prices.

Schnepf (1992) critically examined the nutritional status and household consumption patterns in a survey using regression analysis where the z-score model. The study relied on numerous factors such as income, demographic factors of each household and availability of substitutes. Vellakkal et al. (2015) also evaluated the link that existed between the rising food prices and food consumption using the height-weight Z-score and the Two-stage least squares (2SLS). In their study, they took food prices as the dependent variable. The study also considered various socio-demographic factors, such as age, sex, rural/urban residence, income and education. The results indicated that nutrition was endogenous to food consumption and rising food prices are exogenously related to nutrition. In contribution to the existing literature, they came up with models for determining consumption and nutrition as shown below.

$$\Delta Consumption_i = \alpha + \beta_1 Price_i + \beta_2 Age_i + \beta_3 Gender_i + \beta_4 \text{HHsize}_i + \beta_5 Urban_i + \beta_6 Education_i + \beta_7 Income_i$$

$$\Delta Nutrition_i = \alpha + \beta_1 Consumption_i + \beta_2 Age_i + \beta_3 Gender_i + \beta_4 \text{HHsize}_i + \beta_5 Urban_i + \beta_6 Education_i + \beta_7 Income_i$$

Source: Vellakkal et al. (2015)

where *i* is the research participant; consumption is a vector of per capita daily food consumption, nutrition is research participant's weight-for-height *z* score (wasting);

price is a vector of food prices; HH size is the household size; urban is a dummy for the household's urban or rural location; education is the mother's educational years; and income is a categorical variable of 3 evenly divided income groups (low-, middle and high-income). The α for all models was α = 0.

This study will seek to determine the effect of rising food prices on the dietary intake of the pre-primary children in low-income urban households in a regression analysis using the z-score model. The study will adopt the above models but modified to include dietary intake, dietary diversity and coping strategies. Despite the orientation of the research towards the rising food prices and dietary intake, particular information regarding urban household's dietary quality, consumption patterns and the nutritional needs of each household member seems to be lacking. Therefore, the actual model adopted in this study is expected to incorporate socio-demographic factors, lack of funds to purchase food, decline in food supplies from friends, increase in food prices, unemployed household members, and increase in household expenditure as illustrated in the Econometric Model Specification below.

Building on previous studies, a simple econometric growth model to be estimated during which dietary intake is determined by variables was formulated and presented as:

.

$$y = f(r, a, h, t, p, o)$$

$$y_{i,t} = \beta_0 + \beta_1 r_t + \beta_2 h_t + \beta_3 a_t + \beta_4 t_t + \beta_5 p_t + \beta_6 o_t + \varepsilon_t \quad (1)$$

Where, $lny_{i,t}$ - food shortages as a proxy of dietary intake,

$lnr_{i,t}$ - Lack of funds to purchase food

$lnh_{i,t}$ - Decline in food supplies from friends

$lna_{i,t}$ - Increase in food prices

$lno_{i,t}$ - Unemployed household members

$\ln p_{i,t}$ - Increase in household expenditure

$\mathcal{E}_{i,t}$ - the error term and the subscripts *t* represent time.

ε_t - Error term, β_0, β_1, β_2, β_3, and β_4 are slope coefficients.

2.8 Factors affecting food rising prices

Various studies have attempted to provide the key factors, which are affected in relation to the increasing food prices around the global (De Lisle, 1990; Schlep, 1992; Kearney, 2010). According to Kearney (2010), food consumption patterns is influenced by a number of key elements such as the availability of food, accessibility of the food, individual's choice of food, the main differences in socio-demographic factors, urbanization, prices set by the food industry marketing and the policies of trade liberalization. These elements are further affected by various aspects such as the geographical location, demographic features of the populace, the amount of disposable income that has been set aside for food, urbanization, globalization, marketing, consumer attitude and behaviour, belief and culture of the populace.

Schlep (1992) considered the aggregate income, the amount of income set aside for food, household size and the quantity of calorie available in determining the effect of rising food prices in the urban setting as compared to the rural setting. Because of this, it was noted that there was improved access to health facilities among urban households as well as improved nutrient intake. On the contrary, the rural households

were confronted with numerous challenges such as improper access to health facilities. This could be attributed to the perceived mobility of the rural household.

On the other hand, De Lisle (1990) considered a number of factors, which mainly affected food consumption among urban households. These include the cultural background of the populace, socio-economic condition, lifestyle adopted by the members of the household and the diverse customer's behaviours and necessities. Apart from the socio-demographic factors, dietary quality, consumption patterns and the nutritional requirements, the study also focused on the income, urbanization, consumer attitude and culture. Each of the elements considered in this study are discussed as follows:

2.8.1 Income

For the last few decades, the cost of living has risen at an alarming rate. The per capita income for most households has remained relatively low making it difficult to meet their food intake. Herforth and Ahmed (2015) discovered that the influence of income on dietary quality and consumption rate of urban household is significantly affected by the food environment. For developing nations such as Kenya, the per capita income has been anticipated to begin from the lowest base and rise to higher rates (Kearney, 2010). The increasing income implies that there is need for high energetic diets. Increased level of income and lower cost of food have encouraged increased consumption of specific foods in the urban regions such as fast foods, processed foods and animal-based foods. On the other hand, the educated and rich individuals have adopted a healthy lifestyle in which they are conscious of their food

consumption while the poor households have limited food choices and knowledge concerning nutritional requirements.

2.8.2 Urbanization

For the last few decades, there has been tremendous growth in population around the global. Most of the people have been shifting towards urban areas in search of better jobs, better living conditions, education and access to markets. The rate of urbanization continues to increase unabated in most countries while the rural areas are left undeveloped. Increased urbanization will remain to have an intense effect on the food consumption patterns and the dietary quality of a populace (Kearney, 2010). With a wide variety of food choices in the urban areas and a reduction of physical activities to earn money implies there is high probability of certain diseases increasing such as obesity, cancer, diabetes among others. Urbanization has also affected food consumption by changing the existing dietary behaviour. The fast food industry has taken advantage of this opportunity through the development of small food points that can provide inexpensive take-away meals. These meals are characterized by high levels of salt, calories and meet the needs of customers, for example pizzas, chips, among others. It is worth noting that the nutritive perspective of the urban households seems to have drastically shifted towards greater food calories, extra fats and oils, greater animal protein consumption foods.

2.8.3 Consumer attitude

Recently, there has been an increase in awareness among consumer regarding their health and the type of foods they should take in order to prolong ageing and reduce the risk of lifestyle illness. The presence of various varieties of foods plays a crucial

role in the selection of foods to be consumed in the household. Minimum consumption is required for survival, but the consumption rate of food as perceived by a modern household supersedes these levels making certain that the basic needs are fulfilled. As public awareness regarding sustainability continues to increase, consumer attitudes remain affirmative but the behavioural patterns of customers are not always consistent with these attitudes. Darmon & Drewnowski, (2015) examined the relationship between consumer attitude and behaviour patterns among Belgian consumers and discovered that sustainability was positively correlated to customer attitude and intent to purchase nutritive foods.

2.8.4 Culture

Herforth & Ahmed, (2015)identified several aspects of culture such as language, religion, foods, and festivals, which can influence the consumption rate of food. These aspects form a critical aspect of the household or individual, which unique to a particular group or region. In this case, food is one of the main important roles in people's lives and influences the impacts on their culture. Many cultures have diverse kinds of food which they advocate for and forms part of their food intake as opposed to other foods Headey et al., (2012). For instance, these traditions can affect the degree at which animal products can be replaced by vegetable products and other processed animal foods. Thus, culture significantly contributes to different types of food consumed as opposed to others in the society.

2.9 Chapter Summary

From literature, it was noted that several researches have been conducted on the relationship between the rising food prices and the demand for that particular food,

but few attempts have been made to conceptualize it in literature (Green et al., 2013). Currently, no systematic reviews of the empirical evidence on the relationship between rising food prices and consumption rate at a region level have been done. In addition, there is no study, which has explored whether these relations differ with respect to the dietary quality, nutritional status of each member and the expected food intake. Therefore, this study seeks to examine the effect of rising food prices on the consumption patterns and nutritional status of the urban household in a regression analysis using the z-score model. In the next chapter, the study will present the various methods and procedures of conducting the study.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter provides a detailed description of the methodology, research design, study area, study population, sample and sampling procedure, research instruments, validity and reliability of research instruments, data collection procedures, data analysis and presentation techniques and ethical considerations.

3.2 Research Design

In order to meet the objectives of the study, a descriptive survey research design was adopted. Descriptive survey provides information about the naturally occurring status, behaviour, attitudes, anthropometric measurements and/or other characteristics of a particular group. In this design, the characteristics used to describe the situations or populations in a study are usually some kind of categorical scheme also known as descriptive categories. The study collected information from respondents on their dietary intake, food consumption patterns, their coping strategies and how they are affected by food prices.

3.3 Study Area

The study was conducted in Eldoret, Uasin Gishu County in Kenya. Eldoret was selected by purposive sampling because it is surrounded by prime agricultural land. Eldoret Town is the fifth largest town in Kenya after Nairobi, Mombasa, Kisumu and Nakuru. Eldoret town is located in the former Rift Valley Province, Uasin Gishu County, and lying south of the Cherangani Hills Forest. Eldoret town is the

administrative capital of Uasin Gishu County. The town is on Latitude of 0.5167^0N and longitude of 35.2833^0E. It is 150 square kilometres according to the 1988 municipal boundaries. Eldoret is a cosmopolitan town. Communities settled in Eldoret include Kalenjin, Luhya, Kikuyu, Luo, Kamba, Kisii among others and refugees of Sudanese origin. It has an estimated population of 475,716 as per 2019 Kenya National Bureau of Statistics. Eldoret is boosted by agribusiness and sport tourism. Eldoret is surrounded by prime agricultural land. As a trading centre for Uasin Gishu County, Eldoret economy is largely driven by large scale grain, dairy and horticultural farming and sport tourism especially athletics.

Eldoret town is under Eldoret Municipality. It is divided into 13 wards. Six of them (Huruma, Kamukunji, Kapyemit, Kidiwa/Kapsuswa, Stadium/Industrial and Market) are in Eldoret North Constituency. Three (Hospital, Kapsoya and Kimumu/ Sergoit) are in Eldoret East Constituency and the remaining four (Kipkenyo, Langas, Pioneer/Elgon View and Race Course) are in Eldoret South Constituency. All these three constituencies have more wards within other local authorities than Eldoret municipality. Eldoret municipality comprises of 19 estates namely Racecource, Langas, Yamumbi, Kipkaren, West Indies, Kipkenyo, Kapyemit, King'ong'o, Kamukunji, Kimumu, Munyaka, ElgonView, Kapsoya, Pioneer, Mwanzo, Shauri, Bacon, Huruma and EATEC. These residential estates are low, middle or high income.

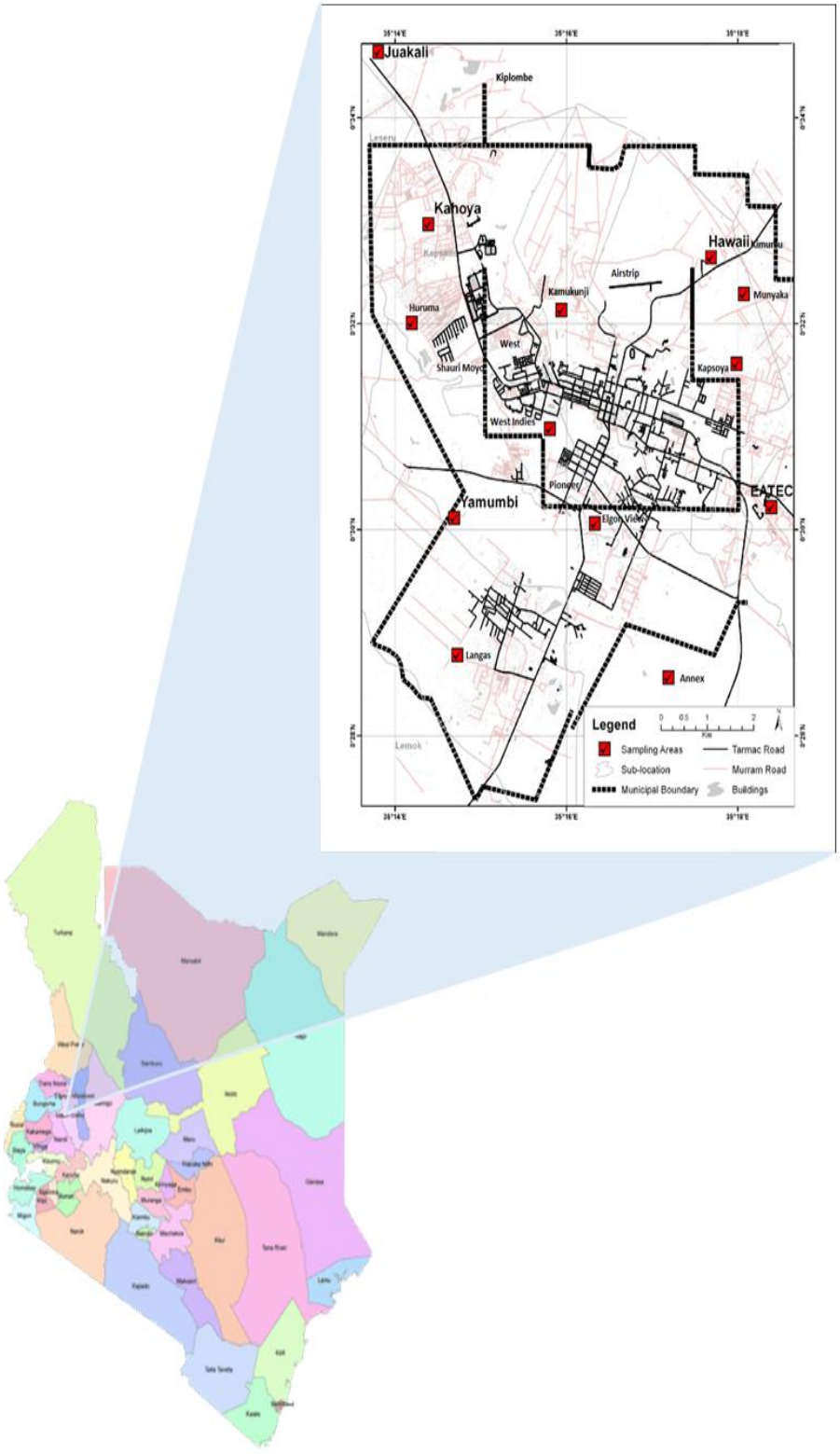

Figure 3:1: Map of Kenya Showing Eldoret

3.4 Target Population

Fowler (2013) describes a population as all the elements that meet the criteria for inclusion in a study while Cochran (2007) defines a population as "the total number of units from which data can potentially be collected". However, according to Lo Biondo-Wood and Haber (2014), a population in research refers to those elements that make up the focus of the study that fit fixed criteria. A target population on the other hand refers to the general population under study, to which the results of the investigation ought to be generalized. The target population for this study was drawn from all the low-income peri-urban households, with pre-primary children in the low-income estates within Eldoret town, Uasin Gishu County. According to the Kenya National Bureau of Statistics (2019), Eldoret town has an estimated population of 475,716 people.

3.5 Sample Size and Sampling Procedures

Sampling is the process of selecting a sub-set of cases in order to draw conclusions about the entire set. A sample is part of the target population that has been procedurally selected to represent it (Desu, 2012). According to Morgan and Case (2013), sampling involves the selection of a few items from a particular group to be studied with a view to obtaining relevant data, which help in drawing conclusions regarding the entire group. According to Dell et al (2002), quantitative researchers should select the largest sample possible so that it is representative of the target population. In this research, multi-stage sampling was used. Eldoret town, Uasin Gishu County was purposively selected. Estates were put into clusters through simple random sampling. Six low-income estates in peri-urban were purposively selected.

Proportionate sampling procedure was used to sample out the households with pre-primary children and their heads from the study area. This agrees with Kerlinger (1986) who noted that a sample size of between 10% and 30% would be good representation of the entire population. This sample size is considered representative and adequate to provide reliability because the population under investigation is similar. This size is also considered economical as relates to time and cost. Thirty per cent of 19 estates gave 5.7 rounded of to 6 estates for better representation. The 6 estates sampled were low income category (Munyaka, Langas, Shauri, Huruma, Kipkaren and Bacon). Majority of residents in these estates were poor and could be affected by fluctuating food prices. According to the Kenya National Bureau of Statistics (2019), the population given is up to the sub location level; therefore, the population of these estates was obtained from the area chiefs. This was from the Kenya National Bureau of Statistics (2019) household clusters.

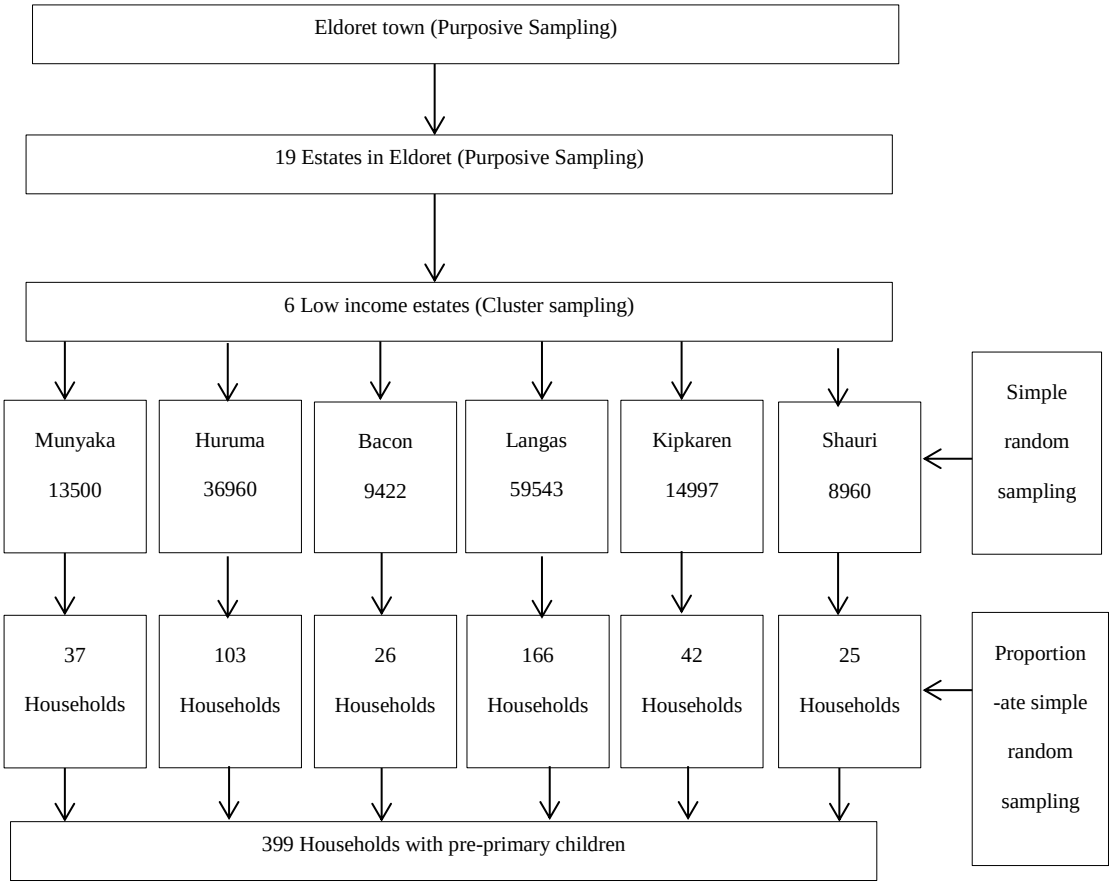

Figure 3:2: Flow chart of sampling procedure

*Total population (KNBS, 2019)

3.5.1 Determining the sample size

To determine the sample size, the target population of 475,716 was considered, this is the population of Eldoret according to Kenya National Bureau of Statistics of 2019. The sample size of this study was calculated by using Taro Yamane (Yamane 1973) formula with 95% confidence level. The calculation formula of Taro Yamane is presented as follows:

$$n = \frac{N}{1 + N(e)^2}$$

Where

n= sample size required

N=population size

e=the error taken as 0.05

Thus n=475716/1+475716 (0.05)^2 =399.36 i.e. 399 households is the sample size.

The researcher selected only those peri-urban households with pre-primary children. In each estate sampled, the following is a table showing the sample distribution,

Table 3:1: Sample distribution

ESTATES	POPULATION	PERCENTAGE(%)	RESPONDENTS
Munyaka	13500	9.4	37
Langas	59543	41.5	166
Shauri	8960	6.2	25
Huruma	36960	25.8	103
Kipkaren	14997	10.5	42
Bacon	9422	6.6	26
Total	143382	100	399

Source: Kenya National Bureau of Statistic (2019)

3.6 Inclusion Criteria

The study included only low-income peri-urban household in Uasin Gishu County in Kenya that have pre-primary children.

3.7 Exclusion Criteria

The study excluded all middle and high-income peri-urban households with pre-primary children who reside in low income estates. The study also excluded all low-income peri-urban households without pre-primary children. Also in a household with more than one pre-primary child, only the elder child was included in the study. The study also excluded children under the age of four years and those above five years.

3.8 Research Instruments

For this study questionnaire was used as the research instrument. Questionnaire is a research instrument that gathers data over a large sample (Kombo and Tromp, 2004). Since it is a standard research instrument, it allows for uniformity in the manner in which questions are asked and makes it possible to be compared across respondents (Cohen and Manion, 2003). The questionnaires consisted of open-ended questions, check list questions and five point Likert scale and was divided into 3 parts as follows:

PART 1: The first part of the questionnaire was the demographic information of the respondents, i.e. gender, age, education, monthly income, occupation marital status household size and household head as checklist questions. The age of the children was enquired from the mother or household head. This was verified by use of documented evidence of the date of birth (such as birth, baptismal or clinic card) where possible to minimize errors of recall.

PART 2: The second part of the questionnaire was questions on dietary intake. Quantitative Food Frequency Questionnaire was used. This was preferred to investigate the dietary intake of pre-primary children in low-income household in

Eldoret peri-urban areas. Dietary diversity was done using Household Dietary Diversity Score (HDDS) for measurement of Household Food Access adopted from Food and Nutrition Technical Assistance (FANTA). The household dietary diversity indicator and the 24-hour recall were used to assess dietary diversity of the households with pre-primary children. They are based on the premise that the more diverse the diet is, the more likely it is to provide adequate levels of range nutrients (FAO, 2011). For these indicators, the dietary diversity scores were created by summing the number of food groups consumed over a 24-hour period to aid in understanding if and how diverse the diets were. The food groups were summed, with each of the groups scored '1' if the household had the food group the previous day and '0' if they had not. This resulted in a diversity score ranging from 0 to 10 for each household with pre-primary children. Higher scores corresponded to a more adequate range of food groups in the diet (FAO, 2011). The food groups used were as follows; cereals, tubers (white roots and tubers and vitamin A rich vegetables and tubers), vegetables (dark green leafy vegetables and other vegetables), fruits (vitamin A rich fruits and other fruits), meats (organ meats and flesh meats), eggs, fish, legumes, nuts and seeds, milk and milk products and oil and fats. Food consumption of the various food groups was also noted. Finally, to get the dietary diversity score, the study included 10 food groups and the dietary diversity was scored as low dietary diversity score for those taking foods from about 1-4 food groups, medium dietary diversity score 5-7 food groups and 8 and above food groups for a high dietary diversity score.

PART 3: This part of the questionnaire had the questions on Coping Strategies. This part used checklist questions.

3.9 Reliability of Instruments

On the other hand, reliability refers to the degree to which the scores obtained with an instrument are consistent (Polit & Beck, 2013). Reliability and validity measure, relevance and correctness of the research instruments are important in a quantitative study. To establish the reliability of the instruments the researcher pre-tested the instruments in ten households in an estate, which is outside the study area. From the responses obtained, the Pearson Product Moment correlation was used to compute co-efficient of correlation (r) between the first and second scores. A correlation co-efficient of more than 0.7 was considered appropriate to judge if the instruments are reliable. According to Krauss (2005), a value of 0.7 and above is high enough to ascertain that the instrument is reliable enough and having a good internal consistency. Feedback obtained from pre-testing assisted the researcher in revising the instruments in order to ensure that it covered the objectives of the study.

3.10 Validity of research instruments

Creswell (2013) defines validity of a research instrument as the success of the instrument in measuring what it sets out to measure so that differences in individual scores can be taken as representing true differences in characteristics under study. Validity is the ability of the instruments to produce same results consistently. The instrument for data collection was sub-divided as per the objectives to ascertain whether the content is comprehensive and representative of the domains to be measured. A pilot study was conducted in an estate that is not sampled to understand the validity of research instruments and data. The questionnaires were administered twice within an interval of two weeks. Content validity was determined through

expert judgment, which involved discussing the items in the instruments with the researcher's supervisors, and colleagues. Their suggestions for change were incorporated in the final instrument to be used in the study.

3.11 Data Collection Procedures

Data collection refers to gathering of information for research purposes (Kothari, 2004). To collect data, permission from National Commission for Science, Technology and Innovation (NACOSTI) was sought. Arrangements were made to visit the households in their estates. A total of 399 questionnaires were administered to the respondents by the researcher and two trained research assistants. The respondents were given sufficient time to accurately fill in the copies of the questionnaire with the required information after which the documents were be collected by the researcher for data extraction and analysis.

3.12 Data Analysis

Data collected was analysed using Statistical Package for the Social Sciences (SPSS) computer package software version 23. The socio-economic information of the respondents was analysed using descriptive statistics in the form of frequency, percentages and mean. Chi-square analysis was done to determine association among variables. Further, multinomial linear regression will be used to show the strength of association between socio-economic characteristics, coping strategies, price of food and dietary intake. Data was presented using frequency tables, pie charts and bar graphs.

3.13 Ethical and logistical considerations

According to Creswell (2013), ethics are the norms for conduct that distinguishes between acceptable and unacceptable behaviour. A number of ethical issues can arise during the academic research, writing, and publishing process. These include plagiarism, fabrication or falsification of data, conflicts of interest, confidentiality, mistreatment of human subjects and animals in research, and authorship issues. Approval to conduct the study was obtained from National Commission for Science, Technology and Innovation (NACOSTI). High level of confidentiality was assured to the respondents. All respondents included in the study were required to provide their consent to participate in the study and were allowed to withdraw if they wished to.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter contains the findings of the study; effects of food price on dietary intake of pre-primary children in low-income peri-urban households in Eldoret Town, Uasin Gishu, Kenya. The results are presented to the objectives as stated in chapter one. Socio-demographic data was presented first, followed by results of the descriptive and inferential analysis with their interpretations. Pearson's Correlation and chi square analysis were significant at $p<0.05$.

4.2 Response Rate

Three hundred and ninety-nine respondents were sampled. The researcher and assistants administered the questionnaires and all the respondents filled the questionnaires, which gave a response rate of 100% during data collection.

4.3 Socio-demographic characteristics of households with pre-primary children in Eldoret town, Uasin Gishu County

4.3.1 Demographic characteristics of households with preprimary children

Table 4:1: Demographic characteristics of households with preprimary children

Item	Response	N	(%)
Gender of child	Male	123	30.8
	Female	276	69.2
Marital status of caregivers	Single	81	20.2
	Married	282	70.6
	Separated	24	6
	Divorced	12	2.9
House Hold size	2-3 members	142	35.6
	4&above	257	64.4
Household members 4 to 5 years old	One member	317	79.4
	Two members	82	20.0
	Three members	0	0.0
	Four Members	0	0.0

N=399

4.3.2 Socio-economic characteristics of households with pre-primary children

According to table 4.2, the current study revealed that majority of the pre-primary children's caregivers had attained tertiary level education with 122(30.5%) having diploma, 100(25%) certificate and 57(14.4%) having a degree. Around 80(20.1%) had secondary education with 40(10.1%) reporting to have primary education only. Of the 399 respondents, a great proportion of the caregivers had formal employment 206 (51.6%) with 69(17.2%) being in informal employment, 105(26.2%) in business and only 19(5%) unemployed. In terms of income, most households had a monthly wage

above Ksh 21000 representing 140(35.2%), followed by wage between Ksh16000-20000 at 103(25.8%) with the least being wage of between Ksh1000 to 5000 at 15(3.7%). The study reported fathers to be the majority when it comes to bread winners 238(59.6%), mothers152 (38.0%) and others (Sister, brother and uncle) at 9 (2.3%).

Table 4:2: Socio-economic characteristics of households with pre-primary children

Item	Responses	N	%
Education level	Primary level	40	10.1
	Secondary	80	20.1
	Certificate	100	25.0
	Diploma	122	30.5
	Degree	57	14.4
Occupation of respondent	Formal employment	206	51.6
	Informal employment	69	17.2
	Business	105	26.2
	Unemployed	19	5.0
Monthly wage	1000-5000	15	3.7
	6000-10000	61	15.3
	11000-15000	80	20.1
	16000-20000	103	25.8
	Above 21000	140	35.2
Family bread winner	Father	238	59.6
	Mother	152	38.0
	Sister/brother/uncle	9	2.3

N=399

4.4 Effects of food price on dietary intake of pre-primary children in low income peri-urban in Eldoret town, Kenya

4.4.1 Dietary intake of households with pre-primary children in low income peri-urban in Eldoret town, Uasin Gishu County.

4.4.1.1 Source of food for households in low-income peri-urban in Eldoret town, Uasin Gishu county

The researcher aimed at determining the sources of food among the households with pre-primary children in Eldoret town, Uasin Gishu County. Out of the 399 respondents, 87.10% indicated to have been buying their food form the market, 10.2% from farming and 2.70% from donations and friends as presented in figure 4.1.

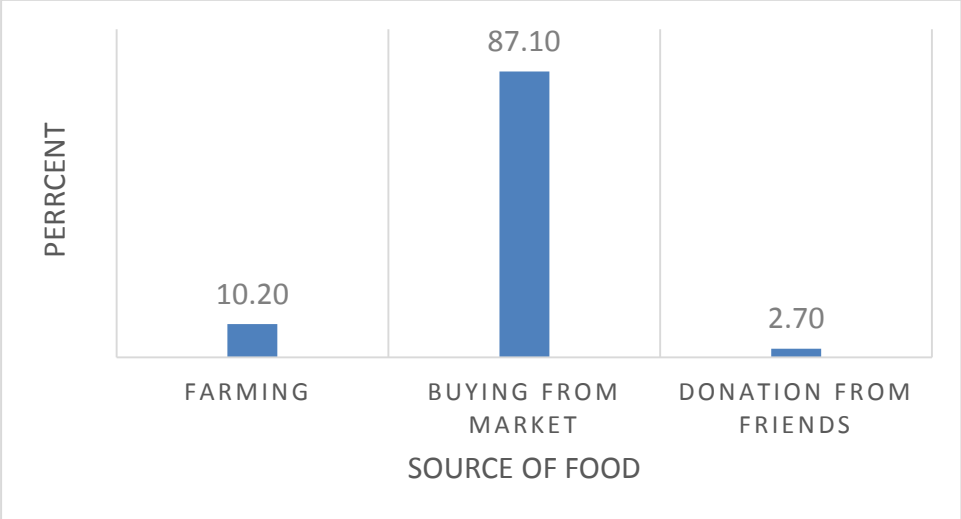

Figure 4:1: Source of food of households with preprimary children

4.4.1.2 Number of meals and type of snacks taken by households with pre-primary children in Eldoret town, Uasin Gishu County

In table 4.3, using 24-hour recall, the number of meals consumed in a day was determined as an aspect of nutrition security in households with pre-primary children

in Eldoret town, Uasin Gishu County. The results show that majority (83.2%) of the households took 3 meals a day with 16% taking two meals a day and 0.8% having one meal a day. The results are shown in Table 4.3.

On the consumption of snacks, majority of the households with pre-primary children indicated not taking snacks 225(56.4%) with 174(43.6%) reporting to have snacks during the day. The most commonly consumed snacks were Mandazi and Bread at 218(54.7%) and 122(30.7%) respectively.

Table 4:3: Number of meals and Snacks intake

Item	Response	N	%
Number of meals/day	One	3	0.8
	Two	64	16
	Three	332	83.2
Snacks intake	Yes	174	43.6
	No	225	56.4
Kind of snacks taken	Bread	122	30.7
	Mandazi	218	54.7
	Sweet-potatoes/arrow roots	45	11
	Boiled maize	14	3.6

N=399

4.4.1.3 Household Food consumption dynamics in times of food shortage

In table 4.4, the researcher assessed if there were times when food was not enough for the households, majority agreed at 209(52.4%) with 190(47.6%) disagreeing. In general, out of 399 respondents 356(89.10%) had experienced food shortage in the last one year, with only 43 (10.9%) not experiencing food shortage. In terms of prioritization of feeding in the household during food shortages, majority reported that

children were first considered in such cases representing 360(90.30%), followed by mothers at 32(7.90%) and the father at 7(1.80%)

Table 4:4: Household Food consumption dynamics

Household Food consumption dynamics	Responses	N	%
Times when food is not enough	Yes	209	52.4
	No	190	47.6
Household food shortage over the last one year	Yes		89.10
	No		10.9
Feeding priority in case of food shortage	Children	360	90.3
	Mother	32	7.9
	Father	7	1.8

N=399

4.3.1.4 Changes in household's dietary intake in the past one year in low-income peri urban areas of Eldoret town, Uasin Gishu County.

Figure 4.2 shows that 334(83.60%) of the respondents had made changes in their dietary intake over the past one year. Table 4.0.5, presents the different types of dietary changes made by the households. Majority significantly increased intake of staple foods 375(94.3%) and reduced number of meals taken a day 280(70.2%).

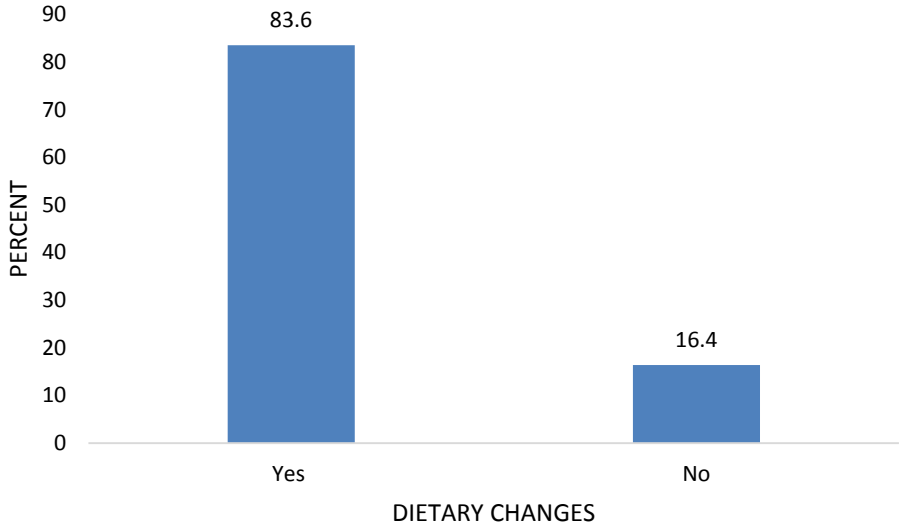

Figure 4:2: Changes in dietary intake

Table 4:5: Changes made in household dietary intake in the past one year

Changes in consumption patterns	**Yes (%)**	**No (%)**
Increase in number of meals taken per day	20.2	79.8
Increase in consumption of staple foods (such as rice, maize flour, wheat flour products potatoes, cassava, green bananas)	94.3	5.7
Increase in the consumption of legumes (such as green grams, beans, peas, cowpeas) and vegetables.	39	39
Increased consumption of animal and milk products (such as meat, poultry, fish, eggs and dairy products)	30.6	69.4
Decrease in the number of meals taken in a day.	70.2	29.8
Decreased consumption of staple foods.	40.1	59.9
Decreased consumption of legumes and vegetables.	59.2	40.8
Decreased consumption of animal and milk products	65.2	34.8

4.4.1.4 Reasons for Changes in Consumption patterns of the households in low income peri urban areas of Eldoret town, Uasin Gishu County.

The researcher investigated the probable reasons for changes in consumption patterns over one year, majority indicated increased food prices 371(93.1%) and lack of funds 312(78.1) as the major reasons as indicated in table 4.6

Table 4:6: Reasons for changes in consumption patterns

Reasons for Changes in Consumption Patterns	Yes (%)	No (%)
Lack of funds to purchase food.	78.1	21.9
Decline in food supplies from friends and relatives	4.3	90.7
Increase in food prices	93.1	6.9
Unemployment of household members	7.6	92.4
Increase of household expenditure due to illness or death.	3	97

N.B: Multiple responses allowed.

4.4.1.5 Change in food prices between Jan and Sept 2021 for common foods.

The researcher, collected secondary data from documented surveys on price changes across regions in Kenya including Eldoret Town, Uasin Gishu County. According to the daily market survey of various individual food products by the Food Price Monitor Kenya, a monthly report developed for the Food Security Portal (FSP). Wholesale and retail prices for several commodities varied regionally (Table1). Compared to the national average price of 40 KES/kg, August retail prices for dry maize were higher in Kisumu (47KES/kg), Nairobi (44 KES/kg), and Nyeri (45 KES/kg). Average wholesale prices for dry maize were higher in Mombasa (33 KES/kg), Nakuru (32 KES/kg), and Nyeri (33KES/kg) than the national average price

of 31KES/kg. Other than the Eldoret region, several regions recorded higher average dry maize retail prices compared to the government recommended price of 33KES/kg during the COVID-19 period. Farmers around the Eldoret region began the maize harvest during the month of August, leading to a reduction in the prices in that region. The average retail price for green/yellow beans was higher in Eldoret (130 KES/kg), Kisumu (125 KES/kg), and Nairobi (120 KES/kg) than the national average price of 111 KES/kg. Most dry beans varieties, including *Mwitemania*, *Nyayo*, and Rosecoco, recorded higher average retail prices in Eldoret, Kisumu, and Nairobi regions; this can be attributed to the fact that most of these varieties in these regions were imported from neighboring Uganda. All regions other than Nakuru recorded higher average retail prices compared to government recommended price of 93KES/kg for Rosecoco and 76KES/kg for *Mwitemania* beans. The lower prices seen in Nakuru could be attributed to the fact that some of these beans were harvested in Nakuru, Narok and neighboring counties, thus driving local prices below the national average. This is presented in appendix VI:

According to appendix VII, Weekly prices varied across regions. In the Eldoret region, most commodities including dry beans, dry maize, wheat, Pishori rice grade1, and Sindano rice portrayed stable wholesale and retail prices throughout August. Alternatively, Irish potatoes showed an increase in wholesale price (33%) between week 1 and week 5, while Basmati rice recorded a decline of 7%.

4.4.1.6 Association between various economic variables and dietary intake among low income households in Eldoret, Uasin Gishu County, Kenya

The researcher sought to find out if there is an association between various economic variables and dietary intake of the households. The chi-square results indicated a significant association between dietary intake and unemployment of household head, increase of household expenditure due to illness/death and decline in food supplies from friends and relatives. On the contrary, lack or inadequate funds in the household and food prices did not show statistically significant association with dietary intake of the household with p value =0.81 and 0.56 respectively. The results are shown in table 4.7

Table 4.7: Association between economic variables and dietary intake

Economic Variable	Pearson chi-square value	df	P-value
Unemployment of household head	194.3	1	0.00
Increase of Household Expenditure due to Illness	12.3	1	0.00
Decline in Food Supplies from friends and relatives	317.5	1	0.00
Lack/inadequate Funds	0.060	1	0.81
Food Prices	0.342	1	0.56

Dependent variable: Dietary intake; association significant at $p<0.05$

Regression analysis results of various economic variables and dietary intake

The researcher went further to determine the strength of association between various economic variables and dietary intake of low-income households with pre-primary children in Eldoret Town, Uasin Gishu County. The Results of Table 4.8 reveal that change in the price of food by one-unit changes negatively the dietary intake by 0.20 units. This implies that when the price of food increases, the type of diet consumed is of low quality and vice versa. However, the results were statistically insignificant with P=0.446.

The same results indicated that decline in food supplies from friends and relatives led to positive change dietary intake by 0.917 units. This applies that when there is an increase in food supplies food from friends and relatives the quality and adequacy of diet taken by the households increases and decreases when there is a decline in supply. The results are statistically significant with p>0.05.

The results also reveal that change in household income and change in funds allocation of household income has direct impact on dietary intake. Results show that change in the funds allocated to purchase food by one unit, changes positively the dietary intake by 0.18 units. This implies that when the amount of funds allocated to purchase food increase, the type of diet consumed is of high quality and vice versa. However, the association was not statistically significant with p=0.30. The findings further showed that change in the expenditure due to illness or death by one unit, changes positively the dietary intake by 0.08 units. This implies that an increase of household expenditure due to illness or death increase the type of diet consumed and the opposite is also true, any decrease in household expenditure due to the same

factors decreases dietary intake by 0.08 units. Although the association was statistically insignificant with p=0.858.

Finally, the results highlight that change in unemployment of household members by one unit, changes negatively the dietary intake by 0.55 units. This implies that when the unemployment level of household members increase, the type of diet consumed is of low quality and vice versa.

Table 4.8: Regression analysis

Unstandardized Coefficients			**Standardized Coefficients**		
	B	Std. Error	Beta	t	Sig.
(Constant)	0.24	100		237	0.813
Lack/inadequate funds to purchase food	0.018	0.017	0.024	1.037	0.300
Decline in food supplies from friends and relatives	0.917	0.038	0.858	23.832	0.000
Increase in food prices	-0.020	0.028	-0.017	-0.729	0.466
Unemployment of household members	0.055	0.042	0.047	1.317	0.189
Increase of household expenditure due to illness or death	0.008	0.043	0.004	0.179	0.858

4.5. Effects of food price on dietary diversity of low income peri-urban in Eldoret town, Uasin Gishu County, Kenya

4.5.1 Food frequency of households with pre-primary children, 4-5 years in peri-urban Eldoret town, Uasin Gishu County.

The study also determined the frequency of consumption of different foods in the seven days prior to the survey. The foods were later categorized into food groups of: cereals, meats, eggs, milk and milk products; legumes, nuts and pulses; green leafy vegetables, other vegetables; vitamin A rich fruits and other fruits, roots and tubers and oils and fats as shown in Figure 4.3. In general, the households with pre-primary children consumed from all the food groups frequently within the past week preceding the study. Cereals were the most consumed food group (99%, n=398) followed by oils and fats (99%, n=396) and vegetables (97%, n=389) in a week. The least consumed food groups in terms of frequency of consumption in a week were meats (47%, n=192) and roots and tubers (48%, n=191).

About the number of times in a week a food was consumed, the mean consumption of the various food groups was calculated. The mean consumption for oils and fats was 6.24 times in a week. Cereals consumption was 6.41 times in a week and vegetables 5.05 times in a week. Milk and milk products were at 4.24 times in a week, fruits 3.75 times in a week, legumes, nuts and seeds 3.23 times in a week, eggs 2.07 times in a week, fish 1.98 times in a week, meats 1.61 times in a week and roots and tubers were consumed 1.54 times in a week. The data is presented on figure 4.3

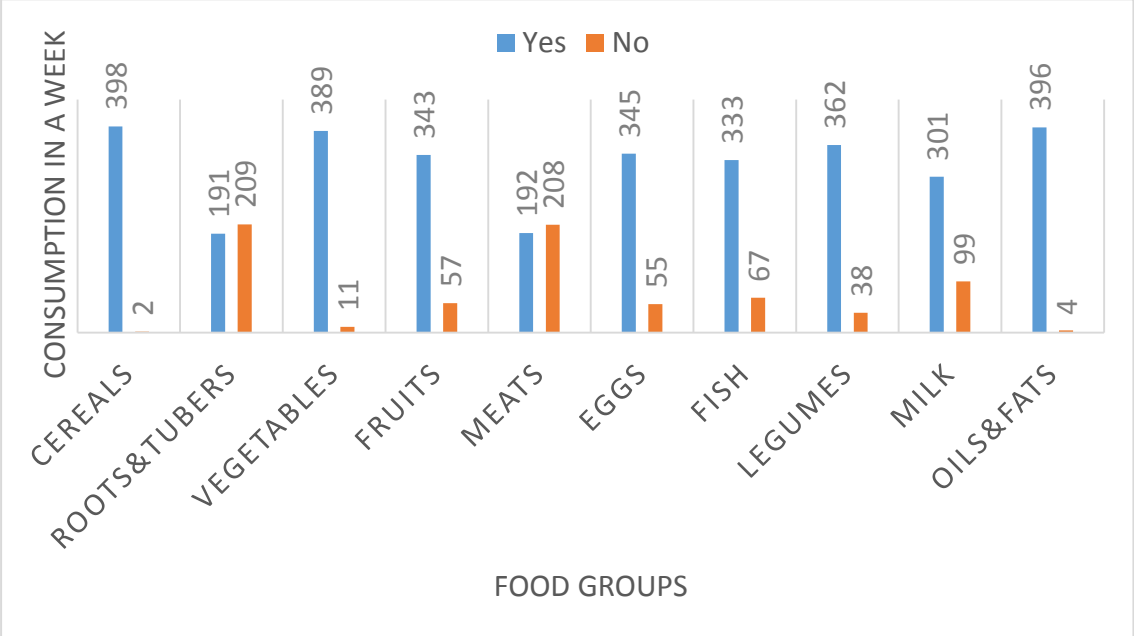

Figure 4:2: Frequency of food group consumption in a week

4.5.2 Dietary diversity score of households with pre-primary children.

The dietary diversity score for households with pre-primary children was calculated using the 24-hour recall. To get the dietary diversity score, the study included 10 food groups and the dietary diversity was scored as low dietary diversity score for those taking foods from about 1-4 food groups, medium dietary diversity score 5-7 food groups and 8 and above food groups for a high dietary diversity score. Majority of the households had a medium dietary diversity score with 183(45.90%), while 89(22.30%) had a low dietary diversity score and 127(31.9%) had a high diversity score respectively. Figure 4.4 illustrates the findings.

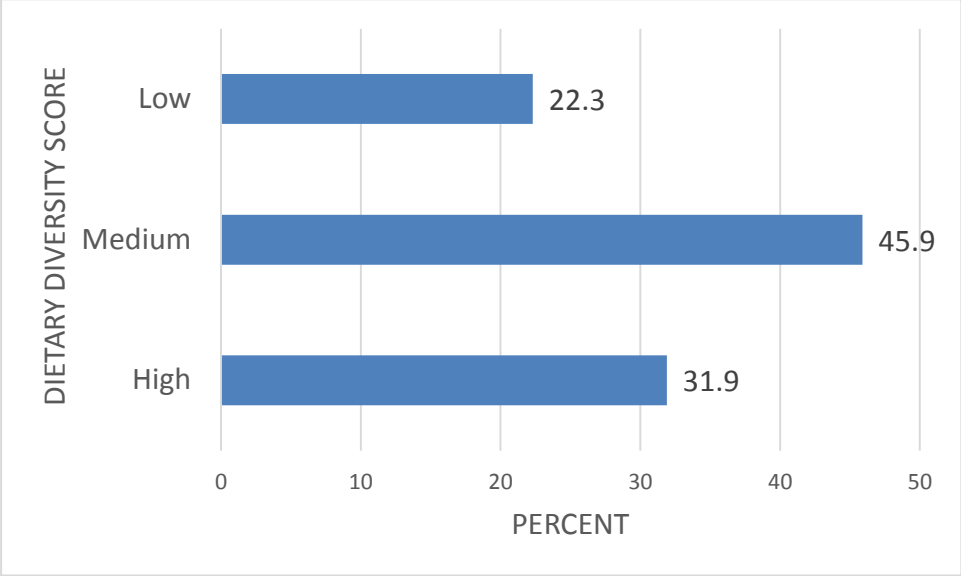

Figure 4:3: Dietary Diversity score

4.5.3 Correlation between food price and dietary diversity in low income households in Eldoret, Uasin Gishu County, Kenya

The researcher sought determine the extent of the relationship between increase in basic food prices and dietary diversity among families with pre-primary children, a chis-square test of association gave $\square^2(10, n=399) = 28.448$, p-value 0.002. This showed that there was a significant relationship between increased food prices and dietary diversity score of households with pre-primary children. The researcher went further to check on the strength of correlation between increased food prices and dietary diversity which indicated a negative significant but weak association, r (397) =-.050, p-value=0.039). The negative association implies that an increase in food prices leads to a 0.050-unit decrease in dietary diversity.

4.6 Cost of food and Coping strategies of households with pre-primary children

4.6.1 Monthly budget allocation for food

The study revealed that majority of the households allocated more than Ksh 4000 for food monthly, 30.6% allocated 3000- 4000 Ksh with the least allocating 1000- 2000 Ksh (10%).The results shown in Figure 4.5

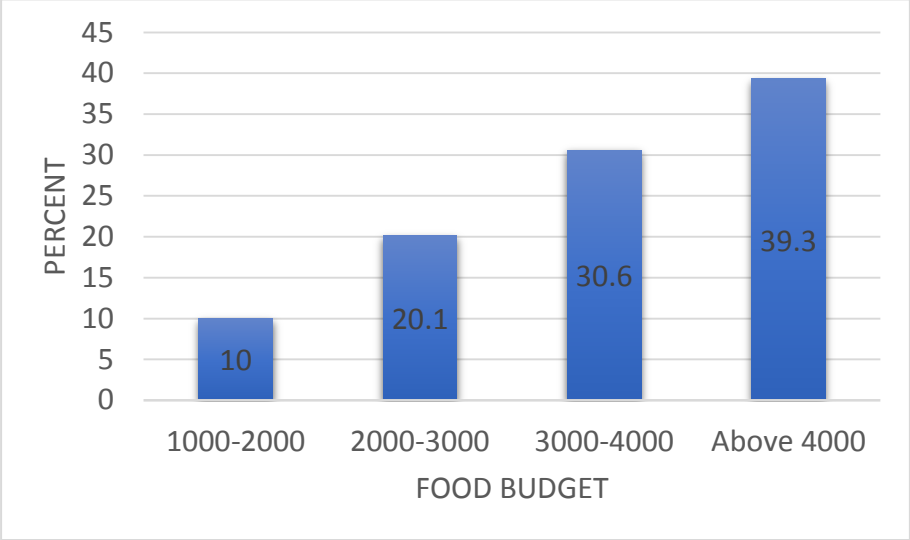

Figure 4:4: Monthly income allocation for food

4.6.2 Effects of the increased food cost on food budget

The researcher found out that the increasing cost of food has negatively affected food budgeting with majority reporting that it led to increased food budget at 276 (69.8%) with 81(20.2%) reporting to have opted for cheaper foods. The results are shown in Figure 4.6.

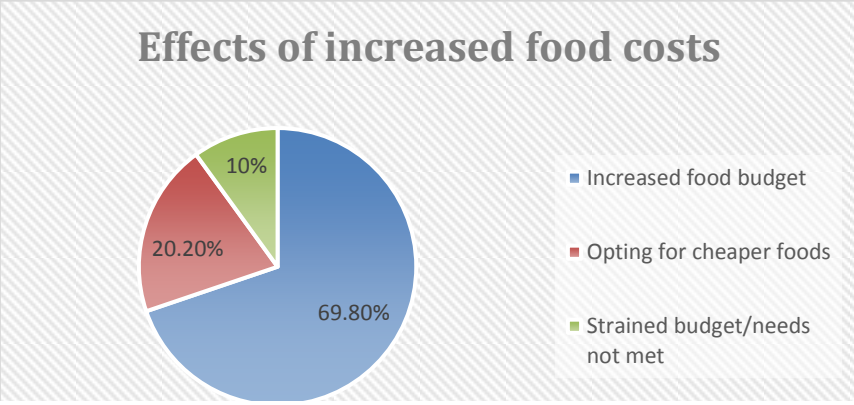

Figure 4:5: Effects of increased food costs

4.6.3 Coping strategies to increased costs of food among the households

The study revealed that, eating less preferred food 329(82.4%), consuming processed foods 316(79.1%), decreasing 303(76%), skipping meals(70%) and reducing portions of food 248 (62.1%) were the most used strategies to cope with the ever increasing costs of foods. This is presented in table 4.9.

Table 4:9: Coping strategies to increasing prices of food.

Table 4.9: Coping strategies to increasing prices of food

Coping strategies	YES (%)	NO (%)
Consuming processed foods	79.1	20.9
Consuming street foods	5	95
Eating outside home	0.7	99.3
Skipping meals	70	30
Reducing meal portion	62.1	37.9
Pulling children out of school	0.0	100
Eating less preferred meals	82.4	17.6
Decreasing food variety	76	24
Women forgoing meals so that children and husband can eat	0.8	99.2
Begging for food	0.4	99.6
Selling assets	1.1	98.9

CHAPTER FIVE

SUMMARY OF FINDINGS AND DISCUSSION

5.1 Introduction

The purpose of the study was to investigate the effects of food price on dietary intake of pre-primary children in low-income households in peri-urban area of Eldoret. In this chapter, the results of the study were summarized and conclusion drawn. The potential areas of future research were outlined.

5.2 Summary of the findings

The summary of findings focused on the following sub headings that formed the study objectives;

5.2.1 Effects of food price on dietary intake of households with pre-primary children in low income households in Uasin Gishu County, Kenya

Data was collected from 399 respondents. The study established that 87.1% of the respondents obtained their food from the market, 10.2% from farming and 2.7% from donations from family and friends. Also 83.2% of the households with pre-primary children consumed three meals in a day with 16% taking two meals in a day and 0.8% having one meal per day. It was found out that 56.4% of these households did not have snacks during the day with 43.6% having snacks. The commonly consumed snacks were mandazi and bread at 54.7% and 30.7% respectively. Further 52.4% stated that there were times when food was not enough throughout the year. Decline in food donations from friends and relatives led to a negative change dietary intake and vice versa. It was also revealed that in case of food shortage the households gave feeding priority to children at 90.3% followed by mothers at 7.9% and fathers at 7%.

Changes in the household dietary intake in the past one year were noted with 83.6% making changes in their dietary intake while 16.4% did not. Majority (93.4%) increased the intake of staple food while 70.2 % reduced the number of meals taken in a day. On the other hand, 65.2% decreased the consumption of animal and milk products. Reasons for changes in consumption patterns were attributed to increase in food prices at 93.1% and lack of funds at 78.1%. There were 89.1% households that experienced food shortages over the past one year while 10.9% did not. The goal of every household is to meet the dietary requirements of their members. However, this is hindered by several factors for example sourcing of food commodities from the market requires that the household head have funds to purchase these food commodities. These funds could be income from employment or self-employment. The prices of food commodities should be affordable since fluctuating food prices and constant wages of the household head results in omission of some items in household food budget. Alternatively, the household may opt for cheaper food commodities, which could of low quality to meet the dietary intake of its members. Change in the price of food affects the dietary intake of household. This implies that when the price of food increases the type of diet consumed is of low quality and vice versa. Decline in food donations from friends and relatives leads to an increase in the quality and quantity of the diet taken by the household. Change in the household income and funds allocated to food budget have direct impact on dietary intake. This implies that when the amount of funds allocated to purchase food increases the type of diet consumed is of high quality and vice versa. It was evident that change in household expenditure due to illness or death positively or negatively affect the household dietary intake, an increase in the household expenditure due to illness or death

decreases the quantity and quality of the diet consumed and the opposite is the same. Unemployment of household members leads to consumption of low quality diet by households and vice versa. Unemployment of household members means less income and less allocation of funds to the food budget.

5.2.2 Effects of food price on dietary diversity

The other concern for this study was the effects of food price on dietary diversity of pre-primary children in low-income households in the peri-urban areas of Eldoret. The findings revealed that all households consumed food from all the food groups frequently in the week preceding the study. Cereals were the most consumed food group at 99.7% followed by oils at 99.2%. The number of times a food was consumed in a week showed that cereals had a mean of 6.4 times, fats 6.24times and vegetables at 5. 05times.Milk and milk products 4.24 times, fruits 3.75, legumes at 3.23, eggs at 2.07, fish at 1.98 times and 1.61 times for meats. This finding imply that an increase in food price lead to a decrease in dietary diversity.

5.2.3 Coping strategies towards food price fluctuations

The study sought to establish the coping strategies towards the food prices in low-income households with pre-primary children in Uasin Gishu County. The findings revealed that majority of households with pre-primary children allocated more than ksh4000 for food monthly at 39.3%, 30.6% of households allocated between ksh3000-4000, 20.1% allocated between ksh2000-3000 with 10% allocating between 1000-2000.

Increased cost of food led to an increased food budget for majority of households at 69.8% while 20.2% opted for cheaper foods and 10.0% had strained budget thus food

needs were not met. To cope with increased food prices, majority of the households at 84.4% opted to consuming less preferred foods, 79.1% consumed processed foods, 76% decreased food variety, 70% skipped meals and 62.1% reduced the portions of food.

5.3 Discussion of the findings

The findings of the study were discussed as follows;

5.3.1 Demographic characteristics of low-income households with pre-primary children.

Basing on the findings of chapter four, most caregivers of pre-primary children were female and majority had attained tertiary education. Majority of the caregivers were in formal employment and for most households the monthly food budget allocated was more than four thousand shillings. The household size was mostly four members for households with pre-primary children

5.3.2 Dietary intake of pre-primary children in low-income households in Eldoret town, Uasin Gishu. Kenya.

Majority of households with pre-primary children consumed their usual foods in a normal day and had three meals in a day. Consistent with the results, Matz et al (2015) concluded that the rising food prices had a negative aggregate effect on the urban households despite the fact that households were still able to sustain their basic food consumption. Alem & Soderbom (2012) concluded that changes in food prices affected households with low-income levels. This could be due unemployment of the household head. Majority of households also did not consume snacks due to lack of

funds and for those households who did, the main snack was Mandazi. The total kilocalorie of these children in a day was below the recommended 1610 kcal per day. The findings coincided with FAO, (2008) majority of the children had inadequate dietary intake. This may be due to rising food prices and decline in food supplies from friends and relatives. This agrees with Mitchell (2008), rising food prices has been considered to have adverse effects on food consumption such as increased distress, increased starvation, lower purchasing ability and perennial poverty. Males had a better nutrient intake compared to their female counterparts. In addition, the findings are similar, Darmon and Drewnowski (2015) findings that most households consumed food from all food groups frequently with cereals being the highest consumed food group. The least consumed foods in a week prior to the study were meat group.

5.3.3 Dietary diversity score of pre-primary children in low income households in Eldoret town, Uasin Gishu county Kenya.

Most households with pre-primary children had a medium dietary diversity score. Most households with pre-primary children admitted to have made changes in their dietary intake in the past one year whereby they significantly increased the intake of staple foods and reduced the number of meals taken in a day. This further agrees with Kearney, 2008 who discovered that 58% of the participants in their study had altered their eating habits because of rising cost of food. There were times of the year when the food was not enough. This coincided with the times of the year when the prices of food went up. This food scarcity was addressed by giving children priority to feed.

5.3.4 Coping strategies of low-income households with pre-primary children towards rising food prices.

Findings show that these households adopted different methods to cope with increased food prices by eating less preferred foods, consuming processed foods and decreased their food variety. This is consistent with Maharan et al (2016) who discovered that 57% of the participants in the study shifted to purchasing cheaper brands available in the market as opposed to the high dietary quality. The study concluded that the rising food prices had adverse effects on poor households' especially female-headed households. In addition, the findings are similar to Matz et al (2015) that most households affected with rising food prices preferred cheaper foods. Shimeles &Delelegn (2013) elaborated a negative impact on rising food prices on the urban households depicted by reduced purchasing power of members. It further agrees with Compton et al (2010) who provided several methods in which the households deal with rising food prices through adoption of various consumption patterns such as buying less expensive foods that have lower nutritional content, reducing the quantity in meals and sometimes skipping meals.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

The findings of the study are in line with earlier observations that decrease in per capita expenditure in various food groups is an indication of low diversity of the food insecure. It can be concluded that food prices affect the dietary intake of pre-primary children in low-income households in peri urban areas of Eldoret, Uasin Gishu, Kenya. When the prices of food increase, it reduces the purchasing power of the household and the quality and quantity of food purchased is compromised. In this case, the household opted for cheaper varieties of food items, which may be of less nutritive value. Pre-primary children in these households had their dietary intake affected by skipping of meals, reducing the portion sizes and lack of snacks as part of their meals.

The effects on dietary intake directly affected dietary diversity of pre-primary children in low-income households in peri urban areas of Eldoret town, Uasin Gishu, Kenya. Some of the food groups were not frequently included in the household diet especially the meat group. As indicated earlier, most of the low-income households in urban areas purchased their food from the market. Majority of them had constant income such that their income did not increase with increase in food prices. In this regard, their food budget remained the same therefore, their dietary intake and diversity was affected negatively.

To address the above scenario, lowest income households with pre-primary children adopted a number of coping strategies. The most used strategy was eating less preferred foods while the least was begging for food. This affected negatively on

dietary intake and diversity that is why most of pre-primary children did not meet the recommended dietary intake of 1610 kcal/day.

6.2 Recommendations

6.2.1. Recommendations for management, stakeholders and policy makers.

Based on the findings and conclusion of this study, the following recommendations need to be considered by the government, nutritionist and other stakeholders;

The government to cushion low-income urban households with pre-primary children against food price spikes as a short-term response to proper dietary intake.

The government of Kenya and other stakeholders should devise multiple ways to boost dietary intake and dietary diversity of low-income urban households' such as kitchen gardening and rearing of chicken to supplement what they buy from the market. Low-income households to adopt positive coping strategies to mitigate the food price effects on dietary intake of pre-primary households

6.2.2 Suggestions for further study

The following suggestions are made for future research;

1. A research on effects of food prices on dietary intake of pre-primary children in low-income households should be carried out in another town to have a comparative study to better inform the government in taking care of the nutrition of the populace especially the pre-primary children.
2. Further research should be conducted in which other variables can be investigated, for instance, the nutritional status pre-primary children in low-income households in rural areas.

3. Research can be conducted on the effects of food prices on any other group of people in the household such as the elderly and the expectant mothers.

REFERENCES

ACF (2014), Action Against Hunger International Nutrition Security Policy, page 8.

Adjoian, T. K., Firestone, M. J., Eisenhower, D., & Stella, S. Y. (2016). Validation of self-rated overall diet quality by Healthy Eating Index-2010 score among New York City adults, 2013. Preventive medicine reports, *3*, 127-131.

Ahmed, B. M. A. (2015). Social and cultural impacts of tourism growth in coastal environments and the potential for sustainability: case study of Egypt and USA. International Journal of Arts and Humanities, *1*(2), 32-48.

Alem, Y., &Söderbom, M. (2012). Household-level consumption in urban Ethiopia: the effects of a large food price shock. World Development, 40(1), 146-162.

Beydoun, M. A., Powell, L. M., Chen, X., & Wang, Y. (2011). Food prices are associated with dietary quality, fast food consumption, and body mass index among US children and adolescents. The Journal of nutrition, *141*(2), 304-311.

Capehart, T., & Richardson, J. (2008). Food price inflation: Causes and impacts. Congressional Research Service, Library of Congress.

Cheng, G., Duan, R., Kranz, S., Libuda, L., & Zhang, L. (2016). Development of a dietary index to assess overall diet quality for Chinese school-aged children: The Chinese children dietary index. Journal of the Academy of Nutrition and Dietetics, 116(4), 608-617.

Clapp, J. (2015). Food self-sufficiency and international trade: a false dichotomy. Note for the state of agricultural commodity markets. FAO, Rome.

Clapp, J. (2017). Food self-sufficiency: Making sense of it, and when it makes sense. Food Policy 66, 88-96.

Compton, J., Wiggins, S., & Keats, S. (2010). Impact of the global food crisis on the poor: what is the evidence? London, ODI, 99, 99.

Counihan, C., & Van Esterik, P. (Eds.). (2012). Food and culture: A reader. Routledge.

da Costa, M. R., & Alves, C. D. A. D. (2015). Self-perception of food intake and dietary quality. International Journal of Nutrology, 8(2), 6-12.

Darmon, N., & Drewnowski, A. (2015). Contribution of food prices and diet cost to socioeconomic disparities in diet quality and health: A systematic review and analysis. Nutrition reviews, *73*(10), 643-660.

Delisle, H. (1990). Patterns of urban food consumption in developing countries: perspective from the 1980s. Food Policy and Nutrition Division, FAO, ed. Rome: Food and Agricultural Organization.

Dubihlela, D., & Sekhampu, T. J. (2014). The impact of price changes on demand among poor households in a South African township. The International Business & Economics Research Journal (Online), 13(3), 463.

FAO (2017). Household food security & community nutrition. Retrieved from http://www.fao.org/ag/agn/nutrition/household_en.stm. Accessed on 27th September 2017

The Food Price Monitor monthly report, Kenya, 2021

Green, R., Cornelsen, L., Dangour, A. D., Turner, R., Shankar, B., Mazzocchi, M., & Smith, R. D. (2013). The effect of rising food prices on food consumption: systematic review with meta-regression. *Bmj*, f 3703*346*.

Gustafson, D. J. (2013). Rising food costs & global food security: key issues & relevance for India. The Indian journal of medical research, 138(3), 398.

Headey, D., Nisrane, F. B., Worku, I., Dereje, M., & Taffesse, A. S. (2012). Urban wage behavior and food price inflation: The case of Ethiopia. *Ethiopia Strategy Support Programme II Working Paper*, *41*.

Herforth, A., & Ahmed, S. (2015). The food environment, its effects on dietary consumption, and potential for measurement within agriculture-nutrition interventions. *Food Security*, *7*(3), 505-520.

Huang, K., Huang, S. W., (2012). Consumer Welfare: effects of increased food and energy prices Applied Economics, 44(19) 2012, pp.2527-2536.

Kalkuhl M., von Braun J., Torero M. (2016). Volatile and Extreme Food Prices, Food Security, and Policy: An Overview. In: Kalkuhl M., von Braun J., Torero M. (eds) Food Price Volatility and Its Implications for Food Security and Policy. Springer, Cham

Kearney, J. (2010). Food consumption trends and drivers: Philosophical Transactions of the Royal Society of London B: Biological Sciences, 365(1554), 2793-2807.

Levell, P., & Oldfield, Z. (2011). The spending patterns and inflation experience of low-income households over the past decade.

Matz, J. A., Kalkuhl, M., & Abegaz, G. A. (2015). The short-term impact of price shocks on food Security-Evidence from urban and rural Ethiopia. Food Security, 7(3), 657-679.

McGranahan, L. (2008). Food inflation and the consumption patterns of US households. Chicago Fed Letter, (Oct).

Mitchell, D. (2008). A note on rising food prices (Vol. 4682). Washington, DC: World Bank.

Mkhawani, K., Motadi, S. A., Mabapa, N. S., Mbhenyane, X. G., & Blaauw, R. (2016). Effects of rising food prices on household food security on female-headed households in Runnymede Village, Mopani District, South Africa. South African Journal of Clinical Nutrition, 29(2), 69-74.

Napoli, M., De Muro, P., &Mazziotta, M. (2011). Towards a food insecurity Multidimensional Index (FIMI). Master in Human Development and Food Security.

OECD (2012). Rising Food Prices, Causes and Consequences <http;//www.oecd.org/trade/agriculturaltrade/4084 088 pdf>

Onen, D (2009).*A general guide to writing a research proposal and report.* Jomo Kenyatta Foundation.

Pons, N. (2011). Food and prices in India: Impact of rising food prices on welfare. Centre De Sciences Humaines, Delhi, India.

Popkin, B. M. (2006). Global nutrition dynamics: the world is shifting rapidly toward a diet linked with noncommunicable diseases. The American journal of Clinical Nutrition, 84(2), 289-298.

Ramachandran, P. (2013). Food & nutrition security: challenges in the new millennium. The Indian journal of medical research, 138(3), 373.

Reusswig.f.Fritz reusswig, Hermann Ltze-Campen, Katrin gerlinger (2003) Changing Global Lifestyle and Consumption Patterns; The Case of Energy and Food.Paper presented in a workshop organized by Population- Environment Network (PERN), 19 October, Montreal Canada.

Schnepf, R. D. (1992). Nutritional status of Rwandan household. Cornell Food and Nutrition Policy Program.

Shimeles, A., & Woldemichael, A. (2013). Rising food prices and household welfare in Ethiopia: evidence from micro data.

Vasantha, S., Vijaylakshmi, S., &Kiran, P. (2015). Review on impact of changing lifestyles on dietary pattern. International Journal of Current Academic Review 3, 135-147.

Vellakkal, S., Fledderjohann, J., Basu, S., Agrawal, S., Ebrahim, S., Campbell, O., & Stuckler, D. (2015). Food Price spikes are associated with increased malnutrition among children in Andhra Pradesh, India. The Journal of nutrition, 145(8), 1942-1949.

Vermeir, I., & Verbeke, W. (2006). Sustainable food consumption: Exploring the consumer "attitude–behavioral intention" gap. Journal of Agricultural and Environmental ethics, 19(2), 169-194.

Von Braun, J., Ahmed, A., Asenso-Okyere, K., Fan, S., Gulati, A., Hoddinott, J., & van Rheenen, T. (2008). High food prices: the what, who, and how of proposed policy actions. Washington, DC: International Food Policy Research Institute.

Wang, Y., Wu, Y., & Zhang, Q. (2013). Fast-Food Consumption: Its Association with Food Prices and Dietary Quality. In Diet Quality (pp. 141-150). Springer New York.

Webster, M. (2016). Dictionary: Newest Edition.

Wodon, Q. T., & Zaman, H. (2008). Rising food prices in Sub-Saharan Africa: Poverty impact and policy responses.

World Bank. (2011) Food prices, nutrition and the MDGs. Global monitoring report. Washington DC: World Bank.

Ministry of Agriculture Livestock and Fisheries (MoALF) (2021). Market Research and Information June 2021 Data

Trend Economy (2021). Kenya Rice World Imports and Exports. Available at https://trendeconomy.com/data/h2/Kenya/1006

Yearbook, F. P. (2003). Food and Agricultural Organization of the United Nations. FAO Statistics Series, Volumes, 35.

APPENDICES

APPENDIX I: QUESTIONNAIRE

Dear Parent/Guardian,

I am carrying out a research on the Food Prices and its effects on dietary intake of pre-primary children in low-income peri urban households in Eldoret Town, Uasin Gishu County. You have been selected to participate in this study. Your response will be treated with a lot of confidentiality.

SECTION A: Demographic Information

Use a tick [ ] appropriately to answer the questions.

1. What is your gender?

1	2
Male	Female

2. What is your marital status?

1	2	3	4
Single	Married	Separated	Divorced

3. What is your household size?

1	2	3	4
2 members	3 members	4 members	Above 4 members

3. How many members in your household are aged between 4 to 5years?

1	2	3	4

4. What is your highest level of education?

1	2	3	4	5
Primary level	Secondary level	Certificate	Diploma	Degree

5. What is your occupation? Indicate in space provided.

……..

6. What is your monthly wage bracket?

1	2	3	4	5
1000-5000	6000-10000	11000-15000	16000-20000	Above 21000

7. Who is the breadwinner of the family?

1	2	3
Father	Mother	other, specify …….

SECTION B: Dietary Intake

1. What are the sources of your food?

1	2	3
Farming	buying from the market	donation from friends

2. How many meals do you take in a day?

1	2	3
1 in a day	1 in a day	3 in a day

3. Do you take snacks between your meals?

1	2
Yes	No

4. If yes, what kind of snack do you take?

1	2	3	4	5
Bread	Mandazi	Sweet potatoes	Arrowroots	Boiled maize

Others (specify) ……

5. Are there times when food is not enough?

1	2
Yes	No

6. If yes, in question five above, who is given the priority?

1	2	3
Father	Mother	Children

7 Did your household change its dietary intake over the past one year?

1	2
Yes	No

8 If yes, in question 7, what changes have taken place? (Multiple responses allowed)

	Changes in consumption patterns	**Yes**	**No**
a.	Increase in number of meals taken per day		
b.	Increase in consumption of staple foods (such as rice, maize flour, wheat flour products potatoes, cassava, green bananas)		
c.	Increase in the consumption of legumes (such as green grams, beans, peas, cowpeas) and vegetables.		
d.	Increased consumption of animal and milk products (such as meat, poultry, fish, eggs and dairy products)		
e.	Decrease in the number of meals taken in a day.		
f.	Decreased consumption of staple foods.		
g.	Decreased consumption of legumes and vegetables.		
h.	Decreased consumption of animal and milk products		

.

i. Other (specify) ……

9. Did your household experience any food shortage over the last one year?

1	2
Yes	No

10. If yes, in question 9, what were the reasons? (Multiple responses allowed)

	Reasons for Changes in Consumption Patterns	**Yes**	**No**
a.	Lack of funds to purchase food.		
b.	Decline in food supplies from friends and relatives		
c.	Increase in food prices		
d.	Unemployment of household members		
e.	Increase of household expenditure due to illness or death.		

f. Others (specify) ……..

Fill in the Quantitative Food Frequency Questionnaire

FOOD ITEM	Quantity	Times Eaten Per Day				Times Eaten Per Week			
		1	2	3	>3	1	2	3	>3
Staples(grains ,roots ,tubers)									
(Ugali) White	100gm								
Brown	100gm								
(Chapati) White	2 Chapati								

Brown	2 Chapati								
Rice	1 cup								
Potatoes	100 gm.								
Cassava	100 gm								
Arrow Roots	100 gm.								
Green bananas	4 pcs								
Proteins (meat & offal)									
Beef	60 gm.								
Lamb	60 gm.								
Mutton	60 gm.								
Chicken	1 pc								
Fish	60 gm.								
Sardines (Omena)	60 gm								
Legumes									
Beans	1 cup								
Lentils (ndengu)	1 cup								
Peas	1 cup								
Cowpeas (kunde)	1 cup								
Vegetables									
Kale (sukuma	½ cup								

wiki)									
Cabbage	½ cup								
Spinach	½ cup								
Pumpkin leaves	½ cup								
Black night shade (managu)	½ cup								
Vine spinach(Ndere ma)	½ cup								
Fruits									
Bananas	1 pc								
Oranges	1 pc								
Mangoes	1 pc								
Pineapples	1 slice								
Apples	1 pc								
Water melon	1slice								

Section B: 2, Dietary Diversity of pre-primary children

Now I would like to ask you about the types of foods that you or anyone else in your household ate yesterday during the day and at night

Read the list of foods. Place a one in the box if anyone in the household ate the food in question; place a zero in the box if no one in the household ate the food.

QUESTIONS AND FILTERS	**CODING CATEGORIES**
A. Any ugali, bread, rice noodles, biscuits, or any other foods made from millet, sorghum, maize, rice, wheat, or	A..... |___|
B. Any potatoes, yams, arrowroots,	B..... |___|

cassava or any other foods made from roots or tubers.	
C. Any vegetables?	C..... |___|
D. Any fruits?	D..... |___|
E. Any beef, pork, lamb, goat, rabbit wild game, chicken, duck, or other birds, liver, kidney, heart, or other organ meats?	E..... |___|
F. Any eggs?	F..... |___|
G. Any fresh or dried fish, shellfish, or omena?	G..... |___|
H. Any foods made from beans, peas, lentils, or nuts?	H..... |___|
I. Any cheese, yogurt, milk or other milk products?	I..... |___|
J. Any foods made with oil, fat, or butter.	J..... |___|
K. Any sugar or honey?	K..... |___|
L. Any other foods, such as condiments, coffee, tea?	L..... |___|

SECTION C: Cost of food and Coping Strategies

1. How much money is allocated for your monthly food budget?

1	2	3	
1000-2000	2000-3000	3000-4000	Above 4000

2.

What is the effect of the cost of food on your food budget ?……

……

……

……

……..

3. How do you cope with these effects? (Multiple responses are allowed)

	Coping strategies	**YES**	**NO**
a.	Consuming processed foods		
b.	Consuming street foods		
c.	Eating outside home		
d.	Skipping meals		
e.	Reducing meal portion		
f.	Pulling children out of school		
g.	Eating less preferred meals		
h.	Decreasing food variety		
i.	Women forgoing meals so that children and husband can eat		
j.	Begging for food		
k.	Selling assets		

APPENDIX II: AVERAGE WHOLESALE AND RETAIL PRICES (KES/KG) BY REGION FOR AUGUST

Commodity	Variety	Average wholesale price (KES/KG						Average Retail Price (KES/kg					
		Eldoret	Kisumu	Mombasa	Nairobi	Nakuru	Nyeri	Eldoret	Kisumu	Mombasa	Nairobi	Nakuru	Nyeri
Dry beans	Army green			78		100				90		110	
	Green/yellow	128	83	79	82	75	82	130	125	90	120	90	111
	Mix						57						73
	Mwitemania		70	74	82	66	76		100	90	120	65	94
	Nyayo		70	76	78				109	90	114		
	Nyayo black			76						90			
	Rosecoco	122	77		82	81	78	130	117		120	90	93
	Saitoti		75	78	78				121	90	120		
	Soya ya jivu			69						80			
	Wairimu	80	59	69	64	64	66	90	104	80	84	70	79
	Yellow	111						120					
Dry maize	Dry maize	29	30	33	31	32	33	30	47	40	44	36	45
Irish potatoes	Shangi	13	15	28	42	19	19	16	32	35	60	30	31
Rice	Ahero		69						99				
	Basmati	116		108	113	114	117	120		120	127	130	130
	Biriani			80						100			
	Mpunga			78						100			
	Pakistan		86						137				
	Pishori grade 1	150	78	130	126	84	120	152	128	150	145	100	150
	Pishori grade 2	93	75			72		94	120			80	
	Sindano	124	73	119	110	103	99	125	115	130	130	121	120
Wheat	Wheat	50	35	48	50	45	46	70	60	60	72	50	71

Source: Food price monitor, Kenya IFPRI, 2021

APPENDIX III: COMPARISON OF JULY AND AUGUST PRICES, 2021

Product	Variety	Average Wholesale Price (Kes/Kg)			Average Retail Price (Kes/kg)		
		July	August	Percent change	July	August	Percent change
Dry maize	Dry maize	32	31	-3%	42	40	-5%
Dry beans	Army green	94	82	-13%	105	94	-10%
	Green/yellow	89	88	-1%	107	111	4%
	Mix	60	57	-5%	77	73	-5%
	Mwitemania	81	74	-9%	94	93	-1%
	Nyayo	78	75	-4%	104	104	0%
	Nyayo black	78	76	-3%	90	90	0%
	Rosecoco	87	88	1%	106	110	4%
	Saitoti	77	77	0%	92	99	8%
	Soya ya jivu	69	69	0%	80	80	0%
	Wairimu	67	68	1%	79	83	5%
	Yellow	109	111	2%	120	120	0%
Irish potatoes	Shangi	26	23	-12%	36	34	-6%
Rice	Ahero	72	69	-4%	101	99	-2%
	Basmati	115	114	-1%	128	125	-2%
	Biriani	82	80	-2%	100	100	0%
	Pakistan	71	86	21%	114	137	20%
	Pishori grade 1	120	118	-2%	131	137	5%
	Pishori grade 2	80	81	1%	91	95	4%
	Sindano	104	108	4%	123	123	0%
Wheat	Wheat	50	46	-8%	67	64	-4%

key	
>+10	Increasing
>+5 but <+10	slight increase
>-5 but <+5	Stable
>-5 but <-10	slight decrease
<-10	Decreasing

Source: Daily Market Survey for July and August 2021

APPENDIX IV: NACOSTI RESEARCH PERMIT

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **354012**

Date of Issue: **15/September/2021**

RESEARCH LICENSE

This is to Certify that Ms.. JANE WAHU of University of Eldoret, has been licensed to conduct research in Uasin-Gishu on the topic: FOOD PRICE EFFECTS ON DIETARY INTAKE OF PRE-PRIMARY CHILDREN IN LOW INCOME HOUSEHOLDS IN ELDORET TOWN, KENYA for the period ending : 15/September/2022.

License No: **NACOSTI/P/21/12993**

354012

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

APPENDIX V: SIMILARITY REPORT

DrillBit

The Report is Generated by DrillBit Plagiarism Detection Software

Submission Information

Author Name	Wahu Jane
Title	FOOD PRICE EFFECTS ON DIETARY INTAKE OF PRE-PRI..
Paper/Submission ID	949714
Submission Date	2023-09-04 15:07:58
Total Pages	106
Document type	Thesis

Result Information

Similarity **11 %**

Sources Type

Report Content

Exclude Information

Quotes	Excluded
References/Bibliography	Excluded
Sources: Less than 14 Words Similarity	Excluded
Excluded Source	**0 %**
Excluded Phrases	Not Excluded

A Unique QR Code use to View/Download/Share Pdf File