

**AN ASSESSMENT OF FOOD CONSUMPTION PATTERNS OF SELECTED HOUSEHOLDS
OF MBILWI AND MATAVHELA VILLAGES IN THULAMELA MUNICIPALITY, LIMPOPO
PROVINCE OF SOUTH AFRICA**

By

AGNES AZWIHANGWISI, MAGADZE

STUDENT NO: 11523674

**A dissertation in the fulfilment of the requirements for Masters in Rural Development
(MRDV) Degree
Institute for Rural Development
School of Agriculture**



University of Venda

**SUPERVISOR: PROF. L.L. MALIWICHI
CO-SUPERVISOR: PROF. A. MUSYOKI
CO-SUPERVISOR: MS. H.V. MBHATSANI**

May 2017

DECLARATION

I, Agnes Azwihangwisi Magadze, hereby declare that this dissertation for Master's degree (MRDV) submitted to the Institute for Rural Development at the University of Venda has not been submitted previously for any degree at this or another university. It is original in design and in execution, and all reference materials contained herein have been duly acknowledged.

Student

A.A. Magadze

Date

Supervisor.....

Prof L.L. Maliwichi

Date

Co-Supervisor

Prof A. Musyoki

Date

Co-Supervisor.....

Ms. H.V. Mbhatsani

Date

DEDICATION

This dissertation is dedicated to the Lord, God of all mankind, for his steadfast love, knowledge and understanding. He blessed me during the time of hardships and struggles. This dissertation is also dedication to my late parents Mr & Mrs Azwiambiwi Solomon (Guards of London) and Rosina Mpfareni Magadze. Also to my sister Mashudu Constance Neluvhalani, my brother Vikili Victor Magadze, my children Fulufhelo, Phindulo John, Mutondwa and my partner Mbengeni Adam Raphalalani for their support both morally, psychologically and financially towards the completion of this work.

ABSTRACT

Health and wellbeing of humans is affected by their eating habits, patterns and choice of meals. This research discusses food consumption patterns of selected households of Mbilwi and Matavhela villages in Thulamela Municipality, Limpopo Province of South Africa. The study identified types of food consumed and the nutritional knowledge of households living in the study area. In addition, the study assessed the knowledge of households on how food choices affect their health. Lastly an analysis of socio-economic factors that influence food consumption patterns in households living in Mbilwi and Matavhela villages was investigated. Using purposive sampling, qualitative and quantitative inquiry were used to explore the research objectives. A sample size of 50 and 47 households from each village were selected respectively and the heads of each household were interviewed. Thematic content analysis was used to categorise data into themes, to address and interpret qualitative data. Themes were generated as the units for analysis based on the objectives of the study to enable interpretation of qualitative information. The quantitative data was analysed using Statistical Packages for Social Sciences (SPSS) version 23.0.

The findings indicated that there was no variety in foods consumed by households in both the weekly food consumption pattern and 24-hour food recall. There was also limited nutrition knowledge of the foods consumed in households of both villages. Households usually consumed energy giving foods such as carbohydrates and body building foods such as proteins. There was low consumption of milk and milk products, fruit and vegetable food groups. Various socio-economic factors such as income, living conditions, health, nutrition knowledge, culture, religion and lack of time to prepare food, affected eating habits. Some foods were recommended or condoned based on religious and cultural factors. Most households were unemployed and relied on government grants and remittances from family members working in the metropolitan centres.

The findings in this study provide a better understanding of food access, availability and consumption in rural areas which can also assist in the formulation of policies that would improve quality of food consumption in rural areas. This study presented an opportunity that can be filled by institutions working in rural areas to support and strengthen their activities. Information sharing with households on the benefits of balanced diets can contribute to the health and the well-being of the society. The emphasis must be on strengthening backyard vegetable/fruit gardens and community food gardening programmes for household consumption

and sale, to generate income. These programmes can also offer fruit/vegetable preservation skills to households in order to help improve the shelf life of the produce. Policy makers must encourage provision of nutritional knowledge to households through different media and channels such as television, clinics, hospitals, schools, and newspapers.

Keywords: eating patterns, eating habits, food consumption patterns, dietary patterns

ACKNOWLEDGEMENTS

I would like to thank the almighty God for his guidance up to this far. Special thanks to my supervisors, Prof L.L. Maliwichi; Prof A. Musyoki and Ms. H.V. Mbhatsani for their professional support throughout the study. My sincere gratitude to my family and colleagues for their generous support in accomplishing this study. Special thanks to Mbilwi and Matavhela traditional authorities and households for welcoming me during the study.

In the course of this study, various individuals played important roles during the proposal development, implementation and final presentation of this dissertation. Their actions together with those who have not been mentioned individually contributed immensely to the success of this work and remain highly appreciated and helped shaped this document through their advice and constructive criticism. May the creator bless them all. I acknowledged the contributions of Dr Segun Obadire, the Chief of the two villages Mbilwi and Matavhela for allowing me to collect data in their areas. I also thank the participants in the research for being part of this success.

TABLE OF CONTENTS

DECLARATION	ii
DEDICATION.....	iii
ABSTRACT.....	iv
ACKNOWLEDGEMENTS	vi
LIST OF FIGURES	xii
LIST OF TABLES.....	xiii
LIST OF APPENDICES	xiv
LIST OF ACRONYMS.....	xv
CHAPTER ONE: INTRODUCTION	1
1.1 Background to the study	1
1.2 Problem Statement	3
1.3 Significance of the Study.....	4
1.4 Objectives of the Study	4
1.4.1 Main objective.....	4
1.4.2 Specific objectives	5
1.5 The Research Questions	5
1.6 Operational Definitions.....	5
1.6.1 Food consumption	6
1.6.2 Food and Eating habits.....	6
1.6.3 Food variety.....	6
1.6.4 Nutrition	6
1.7 Outline of Dissertation.....	6
1.8 Chapter summary	7
CHAPTER TWO: LITERATURE REVIEW.....	8
2.1 Introduction.....	8

2.2	Theories of Eating Habits.....	8
2.2.1	Physical availability	10
2.2.2	Cultural availability	10
2.3	Factors Influencing Food Choices.....	10
2.3.1	Early food experiences	10
2.3.2	Cultural influences	11
2.3.3	Social factors	11
2.3.4	Health	12
2.3.5	Economic influences.....	12
2.3.6	Social changes, modernisation and globalisation.....	13
2.3.7	Other factors that influence food choices	13
2.4	Integrated Food Security and Nutrition Programme	17
2.5	Increased food varieties and recipes.....	18
2.6	A Food Philosophy.....	19
2.7	Recognising a Nutritious Diet.....	19
2.8	Positive and Negative Associations	20
2.8.1	Social interactions.....	21
2.8.2	Emotional comfort.....	21
2.8.3	Body image.....	21
2.8.4	Cultural and social meanings attached to food.....	21
2.8.5	Measuring Food Consumption	22
2.9	Chapter Summary.....	26
CHAPTER THREE: RESEARCH METHODOLOGY.....		27
3.1	Introduction.....	27
3.2	Description of the Study Area	27
3.2.1	Location.....	27
3.2.2	Situational analysis of Mbilwi Village.....	28

3.2.3	Situational analysis of Mutale municipality	28
3.3	Research Design	30
3.4	Data Types and Sources.....	31
3.5	Population.....	31
3.6	Sampling Technique and Sample Size.....	31
3.7	Data Collection	32
3.7.1	Data analysis	32
3.8	Ethical Considerations	33
3.9	Chapter Summary.....	33
CHAPTER FOUR: PRESENTATION OF FINDINGS AND DISCUSSION		34
4.1	Introduction.....	34
4.2	Study Respondents.....	34
4.3	Biographical Data Presentation.....	34
4.3.1	Gender.....	34
4.3.2	Age	35
4.3.3	Marital status	36
4.3.4	Highest grade attained.....	37
4.3.5	Post high school qualification attained	38
4.3.6	Occupation	39
4.3.7	Source of income.....	40
4.3.8	Total household's monthly income	41
4.3.9	Number of people in a household	42
4.3.10	House ownerships	42
4.4	Types of Food Consumed by Households in Mbilwi and Matavhela Villages.....	43
4.5	Weekly Food Consumption Patterns of Selected Foods	43
4.5.1	Carbohydrate	43
4.5.2	Vegetables.....	45

4.5.3	Fruits	46
4.5.4	Milk and dairy foods	48
4.5.5	Meat and legumes	49
4.5.6	Summary of food consumption in the study area	50
4.6	Nutritional Value of Foods Consumed at Mbilwi and Matavhela Villages.....	51
4.7	Nutritional Knowledge of Households Living in Mbilwi and Matavhela Villages	51
4.7.1	Most important meal preferred in a day.....	54
4.7.2	Amount of water to drink in a day.....	54
4.8	The 24-Hour Food Recall.....	55
4.8.1	Factors influencing 24-hour food consumption recall	57
4.8.1.1	Eating habits from parents.....	57
4.8.1.2	Food affordability and food available	57
4.8.1.3	External environmental influences	60
4.8.1.4	Influence of appetite	61
4.8.1.5	Health conditions.....	62
4.8.1.6	Seasons	64
4.8.1.7	Not having enough time to prepare food.....	64
4.9	Other factors influencing food consumption patterns.....	64
4.9.1	Water to drink in a day	65
4.9.2	Hunger.....	65
4.9.3	Knowledge about type of food.....	66
4.9.4	Taste, smell, desire and influence.....	66
4.9.5	Culture, tradition, religion and beliefs	66
4.9.6	Adorability.....	67
4.9.7	For the purpose of getting energy	67
4.9.8	Boredom.....	68
4.9.9	Knowledge about type of food.....	68

4.9.10	Influenced by taste and desire	68
4.9.11	Culture and religious beliefs from parents	68
4.10	Chapter Summary	69
CHAPTER FIVE: RECOMMENDATIONS AND CONCLUSION		70
5.1	Introduction	70
5.2	Recommendations from the Study	70
5.2.1	Recommendations on food consumption	70
5.2.2	Recommendations on factors affecting food consumption pattern	71
5.3	Recommendations on nutritional knowledge of households	74
5.4	Suggestions for Future Research.....	74
5.5	Conclusion.....	74
REFERENCES		76
APPENDICES.....		83
Appendix 1: Questionnaire		83
Appendix 2: Consent Letter		95
Appendix 3: Ethical Clearance Certificate.....		97
Appendix 4: UHDC Approval		98
Appendix 5: Letter for Permission to conduct Research in the Community		99
Appendix 6: Letter of Permission by Vhembe District Government.....		100
Appendix 7: Letter of Request to conduct Research.....		101
Appendix 8: Language Editing Proof of the Proposal.....		102

LIST OF FIGURES

Figure 2.1: Food Pyramid (CNPP, 2005).....	24
Figure 2.2: MyPlate (United States Department of Agriculture, 2011)	26
Figure 3.1: Mbilwi Village within the context of Thulamela Municipality	27
Figure 3.2: Map of Matavhela village within the context of Mutale municipality	30
Figure 4.1: Weekly consumption of carbohydrates in the selected villages	44
Figure 4.2: Weekly vegetables consumption at Mbilwi and Matavhela	45
Figure 4.3: Weekly household consumption of fruits at Mbilwi and Matavhela.....	47
Figure 4.4: Weekly household consumption of Milk and milk products at Mbilwi and Matavhela Villages	48
Figure 4.5: Household consumption of Meat and legumes food group per week.....	49
Figure 4.6: Summary of food group consumption frequency	51
Figure 4.7: 24-hour food recall frequency of the study area.....	56

LIST OF TABLES

Table 2.1: USDA’s Food Guide	23
Table 4.1: Gender distribution of the respondents.....	35
Table 4.2: Age of the respondents	36
Table 4.3: Marital status of the respondents.....	37
Table 4.4: Highest grade attained by respondents	38
Table 4.5: Post high school attained by respondents	39
Table 4.6: Occupation of the respondents.....	39
Table 4.7: Source of income of the respondents	40
Table 4.8: Monthly income of respondents per household	41
Table 4.9: Number of people in a household.....	42
Table 4.10: House ownerships of the respondents.....	43
Table 4.11: Nutritional knowledge of the respondents about food	53
Table 4.12: Most important meal eaten in a day by respondents.....	54
Table 4.13: Glasses of water to drink in a day by respondents.....	55

LIST OF APPENDICES

Appendix 1: Questionnaire	83
Appendix 2: Consent Letter	95
Appendix 3: Ethical Clearance Certificate	97
Appendix 4: UHDC Approval	98
Appendix 5: Letter for Permission to conduct Research in the Community.....	99
Appendix 6: Letter of Permission by Vhembe District Government.....	100
Appendix 7: Letter of Request to conduct Research	101
Appendix 8: Language Editing Proof of the Proposal	102

LIST OF ACRONYMS

CBD	Central Business District
CNPP:	Center for Nutrition Policy and Promotion
DoA	Department of Agriculture
FAO:	Food and Agricultural Organisation
GDP	Gross Domestic Product
IDP	Integrated Development Plan
IFSNP	Integrated Food Security and Nutrition Program
SAFBG	South Africa Food Based Guidelines
SFP:	School Feeding Programs
Stats SA	Statistics South Africa
SPSS:	Statistical Package for Social Sciences
TCEB	Theory of Compromised Eating Behaviour
UHDC:	University Higher Degrees Committee
UNSC:	United Nations Security Council
USDA:	United State Development Agency

CHAPTER ONE: INTRODUCTION

1.1 Background to the study

The hierarchy of needs by Maslow (1946) puts food, shelter and clothing as the most basic human need for survival. However, among these basic human needs, food is the most essential need of life, followed by shelter and clothing. If this is a universal fact, it therefore means that to live, one must eat (Ballari & Barrios-García, 2014). Thus, all living creatures, be they plants, animals and humans, eat food for survival purposes. Chambers (2014) defines food as anything solid or liquid that has chemical compositions, which enables it, when swallowed to do one or more of the following: provide the body with the material from which it can produce heat, or any form of energy; provide material to allow growth, maintenance, repair or reproduce to proceed; and, supply substances, which normally regulate the production of energy or the process of growth, repair or reproduction.

The food intake depends on complex interconnected body signals that are fostered by environmental factors and behavioural influences. What certain people choose to eat has got its background from the earliest experiences in life and is influenced by sensory, aesthetic, economic, geographical, social and cultural factors (Higgs, 2015). Food habits may change with a new environment, new attitudes and new values (Robinson *et al.*, 1990; Pollard *et al.*, 2002).

In addition, food gives us different nutritional elements and non-nutritional values that are necessary for the development of our bodies. Therefore, having a nutritionally balanced meal is a necessity as it prolongs our individual life span (Dube, 2011). The nutritional quality of the diet does not only depend on whether the diet includes plant and animal based products but on whether the diet is based on sound nutritional principles that include adequacy, nutrient balance, calorie control, moderation and variety in the diet (Fahmida *et al.*, 2015).

Nevertheless, not only do we eat to live, what we eat also affects our ability to keep healthy, to work, to be happy and to live well. Hence, it is believed that knowledge of what to eat and in what quantities is a prerequisite to a healthy and happy life (Higgs, 2015). The average nutritional requirements of groups of people are fixed and dependent on measurable characteristics such as age, sex, height, weight, degree of activity and rate of growth (Chambers, 2014; Jemide *et al.*, 2016).

It is believed that good nutrition requires a satisfactory diet which is capable of supporting the individual consuming it, by providing the desired nutrients in required amounts and must provide the right amount of fuel to execute normal physical activities (Johnston *et al.*, 2014). If the total number of nutrients provided in the diet is insufficient, a state of under nutrition will develop (Insel & Wardlaw, 1993; Johnston *et al.*, 2014). Nutrition is a key element to developing and maintaining a good state of health that is required for human survival. In addition, as opined by (Wang *et al.*, 2014) a poor diet coupled with a sedentary lifestyle is known to be a risk factor for life-threatening chronic diseases and ill-health such as heart disease, stroke, hypertension, diabetics and some forms of cancer. It was further observed that together, these diseases account for two-thirds of death in the United States (Labadarios & Steyn, 2011).

Conversely, in the words of Labadarios & Steyn (2011), there are several foods that one can include in one's diet to help prevent or treat diseases. It is said that, the need to draw up a balanced diet chart will ensure that one gets all the nutrients required on regular basis (Fahmida *et al.*, 2015). Hence, a nutritional diet chart helps one to keep track of one's nutritional diet requirements and is a very useful tool when drawing up a personalized diet plan.

There are four main rules that govern what we eat. That is, food should:

- nourish the body;
- help to safeguard good health;
- play a role in increasing the body immune systems by fighting against ailment and diseases; and,
- look and taste good (Reader Digests, 2001).

Furthermore, people should choose different food types (variety) within any given foods group, rather than eating the "same old thing" day after day, that does not help the body in any way. Variety makes meals more interesting and helps ensure that a diet contains sufficient nutrient (Insel & Wardlaw, 1993). However, choices of food to take is largely dependent on the economic status of an individual. Thus, people who have better economic standing have a better access to a variety of food types therefore, affording them access to a variety of nutritional components. Studies have shown that there is a strong correlation

between economic status and the type of food intake (Chambers, 2014). Furthermore, the studies have indicated that in the modern societies, rural people are the poorest, with struggling economies that limit their food choices.

The target goal of the Integrated Food Security Strategy (IFSS) was to reduce the number of food-insecure households by half by 2015. One of the strategic objectives to reach this target is to increase overall domestic production of food and non-food products and by providing support services to farmers (Department of Agriculture, 2006; Latham, 1997). The Department of Agriculture (DoA) in South Africa has the responsibility to provide every citizen access to available food on a sustainable basis. To this effect, the DoA is to support the 244,000 food parcel beneficiaries to make use of the “Starter Packs for Food Production”, for their own benefit (Department of Agriculture, 2006).

It is true that food choices all over the world have vastly improved and increased, however it is important to note that this is correct mainly with cities and is less accurate with rural areas which are faced with a number of economic challenges and hence less balanced meals (Walsh & Van Rooyen, 2015). Africa is among the poorest continents and most of the poor people live in rural areas; South Africa is no exception. There is a huge imbalance between rural and urban dwellers. Thus, people living in South African cities have so many different foods to choose from, as opposed to rural South African communities. It has been stressed that one of the main causes of poor nutrition is a lack of knowledge about food, health and care (Latham, 1997: 451).

1.2 Problem Statement

Mbilwi and Matavhela villages like other communities in South Africa, are comprised of employed, unemployed, self-employed and even those depending on social grants and pensions. However, the large number of people in these villages fall under the unemployed category and those dependent on social grants (Stats SA, 2011). From the pilot study carried out in the area, it is evident that reasonable numbers of people are not eating balanced diets and a number of able-bodied people are unemployed. This may also be connected to a combination of other factors, such as lack of awareness and/or education, community cannot afford balanced diets which may be influenced by their low income level (low socio-economic

status), unavailability of nutritious food due to the geographical location of the village and the municipality itself.

It is however important to note that women and particularly, children are the most affected by malnutrition which slows down their immune system and causing weight loss. The consumption of an unbalanced diet often leads to sickness and diseases. As seen above, there is a need for individuals and the society at large to consume balanced meals to enhance their wellbeing. Therefore, as the less privileged people in rural areas, the study aimed at investigating the food consumption patterns in one of the selected rural areas in Limpopo province. The study established reasons the people of Mbilwi and Matavhela Villages eat and the factors influencing the choices of food they consume.

1.3 Significance of the Study

This study assessed the food eating habits, the reasons people eat what they eat and the impact of these negative and/or unbalanced food consumption habits on households especially on women and children. Moreover, for the purpose of policy formation or information to decision makers this work was able to identify and evaluate the importance of nutritional issues in Mbilwi village and Matavhela village by extension possible implications on other schools around it, thus reviewing the School Feeding Programmes (SFP), feeding policies in the province and the country in general. Lastly, this field of study is still developing as a field of knowledge, and thus, the results would generate knowledge and expertise in related areas for academic research. It is also anticipated that this study will create awareness in the study area on the need and advantages of consuming a balanced diet.

1.4 Objectives of the Study

1.4.1 Main objective

The aim of this research was to assess food consumption patterns of selected households in Mbilwi and Matavhela Villages.

1.4.2 Specific objectives

The specific objectives of this research were to:

- Identify the types of food consumed by households in Mbilwi and Matavhela Villages,
- Analyse socio-economic factors that influence food consumption patterns of households living in Mbilwi and Matavhela Villages,
- Determine whether households of Mbilwi and Matavhela Villages eat nutritionally balanced meals,
- Assess nutritional knowledge of households living in Mbilwi and Matavhela Villages,
- Examine the level of knowledge about the implication of the different types of foods on health of the respondents and the need and advantages of eating variety of food.

1.5 The Research Questions

In the light of the fore-going, the research questions are:

- What foods are consumed by households in Mbilwi and Matavhela Villages?
- What different foods consumed are from nutritionally balanced diets?
- What information about food, nutrition and health do people of Mbilwi and Matavhela Villages have?
- What influence do the consumption patterns of respondents from Mbilwi and Matavhela Villages have on their health conditions?
- What are the socio-economic factors which influence food consumption patterns of households in Mbilwi and Matavhela Villages?

1.6 Operational Definitions

1.6.1 Food consumption

Eating (also known as consuming) is the ingestion of food to provide for all organisms their nutritional or medicinal needs, particularly for energy and growth. Animals eat in order to survive. For humans eating is a daily activity (Answers, 2012).

1.6.2 Food and Eating habits

The term “eating habits” (or food habits) refers to why and how people eat, which foods they eat, with whom they eat, and the ways people obtain, store, use, and discard food. Eating a familiar food and not having to make any decisions can be comforting and this has been the underlying factor for most of our eating habits (Chepape, *et al.*, 2014).

1.6.3 Food variety

Eating a wide variety of foods (a balanced diet) from within and across each of the five food groups, in the amounts recommended (Rolfes & Whitney, 1999).

1.6.4 Nutrition

Nutrition (also called nourishment) is the provision, to cells and organisms, of the materials necessary (in the form of food) to support life (Rolfes & Whitney, 1999).

1.7 Outline of Dissertation

This dissertation is organised into five chapters. Chapter one presents the introduction of the study. It covers the outline and research objectives guiding the study. The chapter gives contextual meaning of the definition of the major concepts and the methodology to be used. Chapter two presents reviewed literature and the empirical studies that have been conducted in the past by previous researchers in line with the research objectives. This chapter focuses on finding out what other scholars and researchers have uncovered or discovered in relation to the topic. Research methodology is presented in chapter three. This chapter presents a detailed picture of how the study was conducted. The chapter states the methods, techniques

and the instruments that were used and how were applied in the study pursuit achieving the desired goals. Analysis, presentation and discussion of results is provided in chapter four. This chapter puts the collected data in a logical and understandable manner so that it could have value to policy makers and academics. Also, the chapter brings about this logical reasoning around the collected information and putting it in a meaningful form. Chapter five will be the last chapter presenting the general discussions, conclusions and recommendations for future research.

1.8 Chapter summary

The chapter outlined the background of the study and reviewed briefly what other scholars have done regarding what food entails, the benefits of food and how people make choices in what they eat. In addition, the chapter went on to illustrate the reason why the study is being conducted and how the study was outlined. The chapter further gave the guidelines as to what the study seeks to achieve.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of literature associated to the food consumption patterns. The review is taken from an international level and is spiralled down to the local area under study. Daily food choices have a lot to do with our age, gender, genetic make-up, occupation and lifestyle, where people live, family and cultural background. Humans eat primarily for nourishment, but food means far more to them. Food symbolises what people think about themselves and can be eaten to project a desired image. People bond, establish relationships and express friendships around the dinner table. In their entire lives, humans spend 13 to 15 years of their waking hours eating (Wardlaw, 1999). Taste and texture are the most important things that influence choice of food, thereafter the cost and convenience of food is considered. What people eat reveals a lot about who they are politically, religiously, and socially. Behaviour, perception and the environment also influence food eating habits. Although some people have no concern for the nutritional value of foods, others agonise endlessly over the taste, energy and fat content.

Inherent wisdom about nutrition that humans might once have had, has been wiped out in most parts of the world by persistent advertising of certain foods and drinks (Answers, 2012). Advancing globalisation has sent products, such as cola drinks to remote parts of the world, and advertisements for them have been so pervasive that some people believe that water cannot satisfy their thirst. Social aspects of eating have also changed in some countries, from regularly scheduled family meals to a pattern of random snacking. The way humans were programmed to eat has changed because of modern business activities. Scientific aspects of nutrition also influence food consumption in many countries as consumers decide whether to eat nutritional foods or those that have no nutritional value (Jemide *et al.*, 2016).

2.2 Theories of Eating Habits

The Change Theory is based on the fact that change usually never comes suddenly from one day to another, but goes through various stages. When one recognises how ready one is for a change of attitude, this will facilitate the process (Gillison *et al.*, 2015). This theory

will be combined with the compromised eating behaviour theory in this study. The Theory of Compromised Eating Behaviour (TCEB) describes the process of compromise that older adults experience related to eating behaviours at home or while hospitalised (Furman, 2014). The theory has four stages: self-indication, joint action, negotiation, and action.

Some food choices are tied to routines and habits. Most of us eat from a core group of foods. Only about 100 basic items account for 75 percent of a persons total food intake. Narrowing our food choices provides us with security. In this context, eating quick-service food (often called “fast-food”) at a restaurant or fast-food outlet provides common expectations, experiences and behaviours (Phillippi *et al.*, 2016). People often agree that their cooking habits are very similar to those of their mothers. Cooking habits are sometimes a reflection of what parents their children, and one should consider taking a cooking class to expand ones knowledge on food choices. Some people are concerned enough about their health to want to change their diets (Furman, 2014). Even so, food tastes and habits still strongly influence people.

Evidences show that theories are influenced by social and psychological determinants (Phillippi *et al.*, 2016). In the study by Phillippi *et al.* (2016), behavioural change and the social cognitive theories have been used to explain the positive associations between the social cognitive constructs and the fruits, the vegetables, the milk groups, and the carbohydrate foods and negative associations with sugar-sweetened beverages, soft drinks, snacks, sugar, and/or sodium, and sweet treats.

Objective and subjective forces are responsible to a large extent for the formation of food habits (Sanjur, 1982). Sanjur (1982), states that the availability of food can be classified into two types namely, physical and cultural. The food patterns of a given group of people have their origins in the variety and availability of foods in the country in which they live (Robinson *et al.*, 1990; Jemide *et al.*, 2016). The physical and cultural availability of food has great effect on the food habits of any group of people, but the way in which these habits affect food patterns varies from community to community. Theories explained greater proportion of variance for intention to dietary intake (Sanjur, 1982).

2.2.1 Physical availability

The physical availability of food means that people cannot eat what is not there. The physical availability of food has long been recognised as a major determinant of food habits within any given community. It includes, food production, food preservation, food distribution, food preparation, materials and culture (African Union, 2006).

2.2.2 Cultural availability

The cultural availability of food is when a society has accepted a type of food they considered edible, harmful, or unacceptable (Sanjur, 1982). Sanjur (1982), Wenkam defines cultural availability as edibility of a material that a culture considers to be food. Food habits are referred according to several determinants associated with the food that is, its social status, physical status, social and ceremonial role, etiquette and the division of labour (Sanjur, 1982). Religious regulations forbid certain foods, pork is forbidden to the Orthodox Jew and to the Muslims. Strict Hindus and Buddhists are vegetarians; they will eat no flesh of any animal, and many of them abstain from eggs and milk (Robinson *et al.*, 1990).

2.3 Factors Influencing Food Choices

2.3.1 Early food experiences

A person's food preference begins early in life and then changes as they interact with parents, friends, and peers. Exposure to people, places, and situations often leads one to expand and change ones food patterns. The earliest food memories may include pancakes on Saturday mornings or hot cocoa on cold winter days. Unfortunately as young children, parents or other adults can severally limit a person's food experiences. Adults may introduce children to only a small subset of available foods because some excellent foods are often considered inappropriate for children (Brown and Ogden, 2004).

Exposure to a variety of foods can help lessen the resistance to try new foods. Young children prefer foods that are sweet or familiar. Pre-school pupils are usually quite willing to

try new things. During school years, children are often strongly influenced by their peers (Brown and Ogden, 2004). Adults need to give children under their care a variety of foods to try. It may take time, but children usually come to accept new foods.

Some inborn reactions to foods include: universal enjoyment of sweet and salty foods, dislike of bitter and sometimes spicy food (Brown and Ogden, 2004). Sweet foods are usually safe to eat but we need to eat salt in foods (both the sodium and the chloride in table salt are essential nutrients), although the amount needed is only about $\frac{1}{4}$ teaspoons a day. Some bitter-tasting foods can also be poisonous (Furman, 2014). According to Furman (2014), inborn responses to some foods can change once we know a food is safe, allowing us to enjoy foods such as Jalapeno peppers and fiery curries.

2.3.2 Cultural influences

Religious rules about foods can further influence a person's diet. Hindus would no more eat beef than you would eat a cat. According to Wardlaw *et al.* (1994), some Jewish people do not eat pork or serve milk products and meat at the same meal. There are also ethnic taboos, for example, Swedish people, who regard corn as food for hogs, would not enjoy an ear of sweet corn.

In the USA, insects are rejected entirely as foodstuff, whereas, some other cultures regard them as choice foods (Almerico, 2014). There are also fixed ideas about what time of the day certain foods can be eaten. Foods like vegetable noodles are not considered favourites by many cultures, whilst many Japanese people prefer to eat noodles at any time of the day (Almerico, 2014). Also, where a person lives can affect their food choices. Various foods are available in different areas, for instance, it is sometimes difficult to find a wide variety of fresh vegetables in winter, in some areas, or ethnic foods in an isolated town (Kwon, 2015).

2.3.3 Social factors

Social changes in recent years have had a strong impact on the food industry. The realities of today's society have an impact on people's food choices - homelessness, unemployment and even divorce must be considered. Shopping malls have created a new generation of "mall munches," who eat everything from ethnic foods to high-priced cookies. Drive-through

restaurants are now a large part of our culture, whereas 30 years ago, they were less common. It is convenient to drive-through, eat 1200 calories (about half or more of your daily energy needs) from burgers, fries or shakes, and as the saying goes, “you are on your way” (Jemide *et al.*, 2016).

2.3.4 Health

A lot of people consider nutrition or what they think are good habits, an important influence on their food purchases. The Americans who tend to make better food choices are often well-educated, middleclass professionals. These are the same people who often are health-oriented and have an active lifestyle. Still, everyone should pay attention to nutritional health. Increased health awareness among minority people is a major goal of the most governments’ health strategies. When people are asked why they do not include foods they know to be healthy in their diet like low-fat milk, margarine and whole-wheat bread, but instead yellow vegetables, rich cheeses and fatty meat, their response is that they like them (Bordi *et al.*, 2002).

2.3.5 Economic influences

Food habits are influenced by the amount of money an individual or family has available for food purchases. As income rises, so do meals eaten away from home. More affluent people also tend to consume more vegetables, fruit, cheese, meat, fish, poultry and fat, while eating fewer dried beans and less rice (FAO, 2005). However, the relationship between income and overall food consumption is not as strong as one might expect, probably because food is inexpensive in South Africa, especially in the villages and suburbs. The average American spends only 13 percent of after-tax income for food (Drewnowski & Darmon, 2005). Compare this to about 50 percent of income spent on food in China or India (Irish Newspaper, 2011). The high meat prices have led to the use of beef as an ingredient rather than a centre piece in some households; chicken, turkey and fish are used as alternatives.

2.3.6 Social changes, modernisation and globalisation

Many social changes in recent years have strongly affected the food marketplace, especially the large increases in the number of working women and single parents, both young and old. Because of these and other factors, a general “time famine” is emerging; convenience rules, especially with the well-to-do families. Many people now turn to quick-service restaurants for meals on the run. Supermarkets are also competing for these restaurant customers, with already prepared foods, microwavable and various other frozen foods being especially popular. Almost 1000 new microwavable products were introduced in a year (Wardlaw, 1999). Survey shows that one-third to one-half of consumers eat such foods regularly to save time. Sales of ready-to-eat and microwavable products marketed directly to children and weight-conscious adults are among the fastest growing product segments (Wardlaw, 1999).

Overall, in today’s fast-paced world, many people are looking for ways to save time. Current surveys show that women want to spend only 30 minutes or less each day selecting and cooking food and men want to spend only 15 minutes on such activities. Not only do many people eat away from home, they also skip meals. In a recent survey of college students, more than half reported that they ate only two meals a day, eating many snacks to make up the difference. Approximately 25 percent of adults skip breakfast which is the appropriate meal to replace stored carbohydrate used during the night’s sleep (Wardlaw, 1999). It is also desirable to eat with others, often. Meal time is a key social time of the day. The Japanese are ahead in their recognising that foods powers go beyond the realm of nutrition. Their national dietary guideline, which stresses the importance of eating a variety of foods, maintaining healthy weight, and limiting fat in the diet, also advises people to make all activities pertaining to food and eating pleasurable.

2.3.7 Other factors that influence food choices

Consumers today value convenience that they are willing to spend over half of their budget on meals that require little or no preparation (Van der Merwe *et al.*, 2015). They frequently eat out, bring home ready-to-eat meals, or have food delivered. In their own kitchen, they

want to prepare a meal in 15 to 20 minutes, using only four to six ingredients. Such convenience limits food choices but does not necessarily mean that nutrition is thrown out of the window, however, convenience is the only consideration. Physical psychology, social and philosophical factors all influence how you choose the foods that you generally eat (Bordi *et al.*, 2002).

In a study done by Pollard *et al.* (2002), it was found that although consumers choose food products for the nutrients they provide, they do not choose their foods exclusively for this reason. Several factors apart from nutrition influence consumer's choice (Richardson *et al.*, 1994). These include motivation for eating, early eating patterns, time available for meal preparation, sensory appeal, financial constraints, peer pressure, habit, social factors, availability and personal ideology (Gowdy & Makenna, 1994, Pollan *et al.*, 2002). These factors could substantially influence health professionals and marketers efforts when recommending dietary changes or effectively communicating product benefit to South African consumers.

Damman *et al.* (2009), did a study to investigate factors affecting low income women, aged between 18 - 65, food choices and the perceived impact of dietary intake and socio-economic status on their health and weight. His findings revealed that price motivated the kind of food items purchased rather than calories, or whether it was a non-nutritious food. Women are the primary food shoppers and coupled with the fact that most of them are low income earners and even unemployed in most cases, they more often experience food insecurity. In addition, most women have low levels of education hence they have limited knowledge of nutrition. The fact of women's low income circumstances has led to most families, especially children, not having access to quality dietary food for an active, healthy life (Damman *et al.*, 2009). He further indicates that the stress of low income, experiencing food insecurity at times, limited knowledge of nutrition, health, and cooking lead to irregular and often unhealthful food-related behaviours, and in effect weight gain.

Furthermore, he reports that several qualitative studies about food choice and access for the low-income population identify strategies to obtain food, such as 'dumpster diving' and skipping meals to make it through times when resources are scarce. However, Damman *et al.* (2009) notes that research into the extent to which this population believes diet and lifestyle factors affect weight status is limited. Therefore, the purpose of their study was to

gather formative data by qualitatively examining the thoughts, feelings and perceptions of low income families regarding the following:

- Food choice, based on limited financial resources.
- Why they make these choices given the well-documented negative consequences of a calorie-dense diet on weight status and health.
- The degree to which they believe that diet, health, and weight status were influenced by socio-economic status.

The following are some of the major themes which emerged:

- Economics of food choice.
- Multiple roles of mothers (or female guardians).
- Impact of environmental situation on food choice and eating behaviour.
- Impact of poverty on diet and health.

Wadolowska *et al.* (2007) did a study on food choice models and eating frequency in the Polish population. Her findings were that among factors influencing food choice, sensory and functional factors were significant, and moderate pricing Advertising was generally denied as an important factor in food choice. Food choices were highly dependent on age, gender, and to a lower extent on region of residence, size of place of residence, economic condition and education level. Women/girls more often showed pro-health behaviours in food choice preferences and food intake.

Brown *et al.* (2005) states that factors that influence our food choices are as follows:

- Psychological influences: emotions and values.
- Nutritional requirements of the individual: food allergies.
- Intellectual influence: knowledge and abilities.
- Social influences: family, lifestyle, reference groups, and the media.
- Food availability: geographical influences, government policy, technological influences and media.
- Physiological influences; hunger and appetite.
- Cultural influences: ethnic, religious and age subcultures, superstitions and taboos.

Only the last two of these reasons for choosing foods, assigns a high priority to nutritional health. Similarly, the choice of where, as well as what to eat is often based more on social considerations than on nutrition judgment. College students often choose to eat at fast-food and other restaurants to socialise, to get out, to save time or when they are on a date; they are not always conscious of the need to obtain healthy food. People choose food and beverage based on several factors, for example, it is important how food looks and tastes, but other considerations that all play a part include, eating for health, cultural, religious, psychologically and social needs, and budgetary concerns.

2.3.7.1 Place of birth

A person's birthplace influences the foods that the person will be exposed to, and helps to shape the dietary patterns that are often followed for life.

2.3.7.2 Religious criteria

Religion is another important influence on food choices. Religious beliefs affect the diet of many by declaring which foods are acceptable and unacceptable and by specifying preparation procedures. Research done by Brown (2008) indicates that more than 85 percent of the American population claims to be Christian, and the bread (wafers) and wine served by many denominations during communion symbolise the body and blood of Christ. A traditional holiday meal with a turkey or ham as the main entree is usually served at Christmas and/or Easter. The eggs used at Easter symbolise new life and were originally painted red to represent Christ's blood - early Christians exchanged these eggs to recognise each other. Another food used among Christians is fish, which for many Catholics, until recently, was served on Fridays instead of meat.

2.3.7.3 Influence of balanced food on healthy living

Brown *et al.* (2005) in their investigations posed a question on what people eat. The response was "Nowadays, much attention is given to healthy living. People spend a lot of

money on being healthy; they read about it, listen to it on the radio, watch television programmes about healthy living and go to gym. When they posed then next question on what sort of person are we. Someone who drinks carrot juice and eats lots of chocolate? Someone who never does exercise? The response was ‘Someone who eats lots of fatty foods?’ Brown *et al.* (2005) suggest what we should eat. They indicate that we all eat the wrong foods or follow poor diets at some stage, or perhaps we are still doing it and this can result in poor health. A large part of being healthy means knowing how your body and mind work. They point out that we must know what our body needs to function properly. According to Brown *et al.* (2005), diet is the food that we eat every day, every person is on a diet. When people say, they are on a diet meaning a slimming diet, people eat either certain foods and avoid others to help them lose weight or they simply cut down on the amount of food they eat; no food is bad, it depends on what a person eats regularly (Brown *et al.* 2005). Most foods help us grow, repair cells in our bodies and give us energy. For example, if you only ate sugar (such as chocolates and sweets) all day, your diet would be very poor. Eating chips once a week is not bad for a person, but eating chips twice a day or even every day might be bad. Brown *et al.* (2005) elaborate on “a balanced diet” as being made up of a variety of foods. If a variety of foods are consumed, a variety of nutrients will be taken in, which makes it easier for the body to get everything needed to function well.

2.4 Integrated Food Security and Nutrition Programme

In analysing the possible nutritional impacts on household and individual behaviour in response to high food prices, coping strategies can be classified as being either food-based or non-food based. The first in the food-based coping strategies is the sudden loss in purchasing power which may result in changes in the quantity, quality and/or diversity of food items consumed.

Food-based interventions should aim to maintain or improve dietary diversity in order to prevent increases in micro-nutrient deficiencies (CNPP, 2005). Policy and programme responses should include direct interventions such as micro-nutrient supplementation or distribution of fortified foods for highly vulnerable groups, such as children and pregnant or lactating women. These stopgap measures should be complemented by longer-term measures to ensure that low-income households have access to affordable diversified

diets. Such examples include supporting small-scale food industries to produce weaning foods of good nutritional quality; supporting and promoting breastfeeding; providing adequate nutrition education messages; and conducting growth monitoring (Department of Agriculture, 2006).

2.5 Increased food varieties and recipes

The cultural diversity, varied cuisines and general high nutritional status should be points of pride for South Africans. Today, they can choose from a tremendous variety of food products, the result of continual innovation by food manufacturers. During the last hundred years, the USA has led the world in creating new food products from toasters; pastries to microwave popcorn; the variety of food products in a typical supermarket is nearly limitless. Even astronauts in space have their unique food product: a plastic bag containing the nutritional equivalent of an entree, two side dishes, and a beverage which is kneaded for several minutes and then squeezed into the mouth. More than ever before, today - breakfast, cereal, pizza entrees, stir-fried meat and vegetables served on rice, salads, tacos, burritos, and fajitas are consumed. Sales of whole milk are down, while in the same time period sales of non-fat and 1% low-fat milk have increased. Consumption of frozen vegetables is also on the rise.

More than half the shoppers in a recent survey said they are eating more fruits and vegetables to contribute to healthful diets. Shoppers said they are also eating less meat (34%), fewer fats and oils (25%), less sugar (19%), more chicken (16%), dietary fiber (16%), and fish (14%) (Wardlaw, 1999). Still, soft drinks are more popular than milk, although not as beneficial to the diet. Overall, many of these recent diet changes are advantageous, whilst some are not.

Lately, Americans live longer than ever before and many enjoy better general health. They also have money, more diverse food and lifestyle choices to consider, and more time to relax and enjoy life (Wardlaw, 1999). The nutritional consequences of these trends are not fully known. Deaths from heart diseases, strokes, for example, has dropped dramatically, since the late 1960's, partly because of better medical care and diets, still, if affluence leads to sedentary lifestyles and high intakes of fat, sodium and alcohol, it can be a villain. Because of better technology and greater choices, we can have a much better diet today

than ever before - if we know what choices to make. The goal of this study is to help find the best path to good nutrition. There are no “junk” or bad foods, but some foods provide relatively few nutrients in comparison to their energy content and thus contribute to less nutritious food behaviours. One’s overall diet is the proper focus in a nutritional evaluation.

2.6 A Food Philosophy

You may be surprised to learn that what you should eat to minimise the risk of developing the common nutrition-related diseases seen in the United States or other countries is exactly what you have heard many times before such as, you should consume a variety of foods balanced by a moderate intake of each food or you become what you eat (Oliver 2016). A variety of foods is the best because no one food meets all your nutrient needs. The best plan consists of learning the basis of a healthy diet. That is, a variety and balances of food from all food groups and moderate consumption of all foods. These aspects of a healthy diet-variety, balanced and moderation will be continually stressed throughout this study. Health professionals have recommended the same basic diet plan for the past 30 years.

2.7 Recognising a Nutritious Diet

A nutritious diet has five characteristics:

- a) Adequacy; the food must provide enough of each essential nutrient, fibre and energy.
- b) Balance; the choices do not over-emphasise one nutrient of food type at the expense of another.
- c) Calorie control; the food provides the amount of energy you need to maintain appropriate weight - not more, not less
- d) Moderation; the foods do not provide excess fat, salt, sugar or other unwanted constituents.

- e) Variety; the foods chosen differ from one day to the next. In addition, to maintain a steady supply of nutrient, meals should occur with regular timing throughout the day. Nutrition scientists agree that people should not eat the same foods, even highly nutritious ones, day after day. One reason is that variety increases the likelihood that diet will be adequate in nutrients (Sizer & Whitney, 2006; Younes *et al.*, 2014).

In addition, some non-nutrient food components are probably important to health; some foods may be better sources of these than others. Another reason is that a monotonous diet may deliver large amounts of toxins or contaminants. Each such undesirable item in food is diluted by all the other foods eaten with it and is even further diluted if the food is not eaten again for several days. Lastly, variety adds interest - trying new foods can be a source of pleasure.

A caution is in order here, for example, the most likely outcome of relying solely on variety could easily be a low-nutrient, high-calorie diet consisting of a variety of snack foods and nutrient - poor sweets. If you establish the habit of using the principles just described, you will find that choosing a healthful diet becomes as instinctive as brushing your teeth or falling asleep.

2.8 Positive and Negative Associations

People tend to like foods with happy associations - such as hot dogs at ball games or cake and ice cream at birthday parties. People can attach intense and unalterable dislikes to food that they ate when they felt sick, or that were forced on them when they were not hungry. Parents may teach their children to like and dislike certain foods by using those foods as rewards or punishments. Sometimes foods are associated with certain uses, for example, people may believe that peanut butter is for children, or that lobster is for the rich. Then, depending on whether they permit themselves to be childlike or to indulge in luxuries, they will choose to eat or refrain from eating those foods (Furman, 2014).

2.8.1 Social interactions

Food signifies friendliness. Consumption of meals has become a social events, and the sharing of food is part of hospitality. Social customs almost compel people to accept food or drink offered by a host or shared by a group (Phillippi *et al.*, 2016).

2.8.2 Emotional comfort

Some people eat in response to emotional stimuli, for example, to relieve boredom, depression or to calm anxiety. A lonely person may choose to eat rather than go to a friend and risk rejection (Fahmida *et al.*, 2015). A person who has returned home from an exciting evening out may unwind with a late-night snack. Eating in response to emotions can easily lead to overeating and obesity, but may be appropriate at times. For instance, sharing food at times of bereavement serves both the grievers need to provide comfort and the receivers need to be cared for and to interact with others, as well as to take nourishment.

2.8.3 Body image

Sometimes people select foods and supplements that they believe will improve their physical appearance and they avoid those they believe might be detrimental. Such decisions can be beneficial when based on sound nutrition and fitness knowledge, but they undermine good health when it is based on faddism or carried to extremes. Eating is an intentional act. Each day people choose from the available foods, prepare the foods, decide where to eat, which customs to follow, and who to dine with. Many factors influence food-related choices (Phillippi *et al.*, 2016).

2.8.4 Cultural and social meanings attached to food

Like wearing traditional clothes or speaking a native language, enjoying traditional cuisines and food may be a celebration of a person's heritage or their friends. Sharing ethnic food can be symbolic. People accepting those foods are expressing a willingness to share cherished values with others. People accepting such kinds of foods are symbolically

accepting not only the person doing the offering but the person's culture. Cultural traditions regarding foods are flexible; they keep evolving as people move about, learn about new foods, and teach others. Today, some people are ceasing to be omnivores and are becoming vegetarians. Vegetarians often choose this lifestyle because they honour the lives of animals or because they have discovered the health and other advantages associated with diets rich in beans, whole grains, fruits, nuts and vegetables (Furman, 2014).

2.8.5 Measuring Food Consumption

Measurement of dietary intake is conducted: to compare average nutrient intake of different groups, to rank individuals within a group and to estimate an individual's usual intake. Quantitative dietary measurement techniques can be categorised as daily food consumption methods (food record and 24 hour recall) and recalled or average food consumption methods (diet history and food frequency questionnaire). According to Lee and Nieman (2010), these methods are also categorised as meal based (food record and 24 hour recall) and list based (food frequency questionnaire).

Assessing the diets of ethnic populations must be done by a person of the same ethnic or cultural background for effective gathering of information. Food frequency questionnaires are usually modified to include foods common to the ethnic group. Food records and 24 hour food recalls are often for smaller population whereas, food frequency are used for larger population (Lee and Nieman, 2010).

2.8.5.1 The 24 hour food recall

In this method, a trained interviewer asks the respondents to recall in detail all the food and beverages consumed during the previous 24 hour period or preceding day. Multiple single-day recalls on different individuals can give a valid measure of the food intake of a group or population (Gibson, 2005).

2.8.5.2 Food frequency questionnaire

The food frequency questionnaire aims to assess the frequency with which food items or food groups are consumed during a specified time period. It was originally designed to provide descriptive qualitative information about usual food consumption patterns. The questionnaire consists of a list of food and an associated set of frequency of use response categories. The frequency of use response categories may be daily, weekly or yearly depending on the study objective (Gibson, 2005).

2.8.5.3 Balancing the diet

The correct intake of food is of utmost importance to maintain healthy body and sound mind. The human body like any other mechanism needs the necessary substances to keep it running smoothly. The food that we eat supplies the body with fuel for energy and warmth, materials to build and repair body tissues. A healthy, balanced diet includes food that contain the necessary nutrients to maintain body function (Chin *et al.* 2004). One way to balance ones diet, is to select foods from the five major food groups every day. Countries have different food guidelines that guide the consumption of a balanced diet. The United State Development Agency (USDA) food guide shown in table 2.1, lists the food groups and the number of servings to consume from each group.

Table 2.1: USDA's Food Guide

Food Group	Type of food	Serving
Carbohydrates	Bread, Cereal, Rice and Pasta	6 - 11
Protein	Meat, Poultry, Fish, Dry beans, Eggs and Nut	2 - 3
Mineral	Fruits and Vegetable	3 - 5
Fat and oil	Fats, Oils and Sweets	Use sparingly
Calcium	Milk, Yoghurt and Cheese	2 - 3

Source: (Insel and Wardlaw, 1993)

Modern man and especially modern, western man, is faced with a bewildering number of foods to choose from. Compared to our ancestors and rural people in Africa, people living in South African cities have so many different foods to choose from, that it is quite understandable that they get confused. However, the basic food groups for different countries have remained the same, only the variety in each group has expanded dramatically. Foods can be classified into a number of broad categories: carbohydrates or grains and cereal group (Figure 2.1).

The body needs 6 to 11 servings of these every day; in the fruit group, each person requires 2 to 4 servings every day; in vegetable group, each person needs 3 to 5 servings of these every day; in milk and dairy group, an individual requires 2 to 3 servings a day; in meat, fish and egg group, each person needs 2 to 3 servings every day. Fat and oil may be found in all other food groups and needs to be used sparingly (CNPP, 2005).

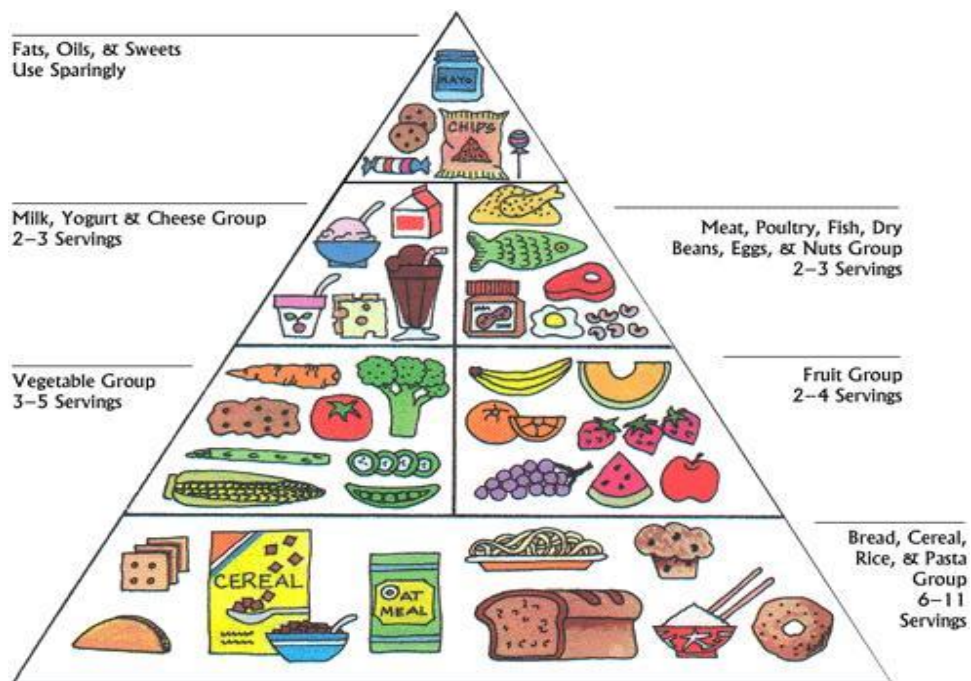


Figure 2.1: Food Pyramid (CNPP, 2005)

2.8.5.4 The South African food-based dietary guidelines

The South African food guide displays seven food groups to be eaten regularly: starchy foods; vegetables and fruits; dry beans, peas, lentils and soya; chicken, fish, meat and eggs; milk, *maas*, yoghurt; fat and oil; and water. It only shows food groupings (composed of local and affordable foods) that are necessary for healthy eating, and unlike other food guides, it does not include items whose consumption should be limited, such as highly processed foods high in sugar, fat and salt. The size of each food group segment reflects the volume the group should contribute to the total daily diet. The South Africa Food Based Guidelines (SAFBG) recommends to:

- Eat a variety of foods
- Be active
- Make starchy foods the basis of most meals
- Eat dry beans, peas, lentils and soy regularly
- Eat chicken, fish, meat or eggs can be eaten daily
- Drink lots of clean, safe water
- Eat plenty of vegetables and fruit every day
- Eat fats sparingly
- Use foods and drinks containing sugar sparingly, and not between meals.

2.8.5.5 MyPlate

MyPlate is the current nutrition guide published by the USDA Center for Nutrition Policy and Promotion. It replaced the USDA's MyPyramid guide on June 2, 2011, ending 19 years of USDA food pyramid diagrams. The USDA's first dietary guidelines were published in 1894 by Dr Wilbur Olin Atwater as a farmers' bulletin. Since then, the USDA has provided a variety of nutrition guides for the public, including the Basic Seven (1943–1956), the Basic Four (1956–1992), the Food Guide Pyramid (1992–2005), and MyPyramid (2005–2013).



Figure 2.2: MyPlate (United States Department of Agriculture, 2011)

MyPlate is divided into four sections of approximately 30 percent grains, 40 percent vegetables, 10 percent fruits and 20 percent protein, accompanied by a smaller circle representing dairy, such as a glass of milk or a yogurt cup (Figure 2.2). MyPlate is supplemented with additional recommendations, such as "Make half your plate fruits and vegetables", "Switch to 1% or skim milk", "Make at least half your grains whole", and "Vary your protein food choices". The guidelines also recommend portion control while still enjoying food, as well as reductions in sodium and sugar intakes.

2.9 Chapter Summary

In this chapter, factors influencing food consumption patterns, detailed background of food consumption patterns, methods of measuring diet and different food guidelines that guides the consumption of a balanced diet were discussed. Furthermore, the chapter outlined the benefits and factors that are associated with food consumption.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter introduces the study area and the research methodology that was used in this study. The research design, population sampling procedure, data collection, data analysis tools and ethical consideration procedures that were used are described.

3.2 Description of the Study Area

3.2.1 Location

This study was undertaken at Mbilwi and Matavhela Villages within the Thulamela and Mutale local municipalities respectively, in Vhembe District of Limpopo Province of South Africa. Limpopo is one of the most under-developed Provinces in South Africa. It contributes less than 6 percent to the gross domestic product (GDP) of the country (Stats SA, 2016). Thulamela Municipality is in Thohoyandou and was established in 2000 through the process of transformation of local government. It is made up of four local Municipalities, namely, Makhado, Musina, Thulamela and Mutale. It covers 21,407 km² and has a population of more than 1.1 million living in 274,480 households which are dominated by the Tshivenda- speaking people (Vhembe District, 2015). It is an agricultural district and yet it is ridden with food insecurity.

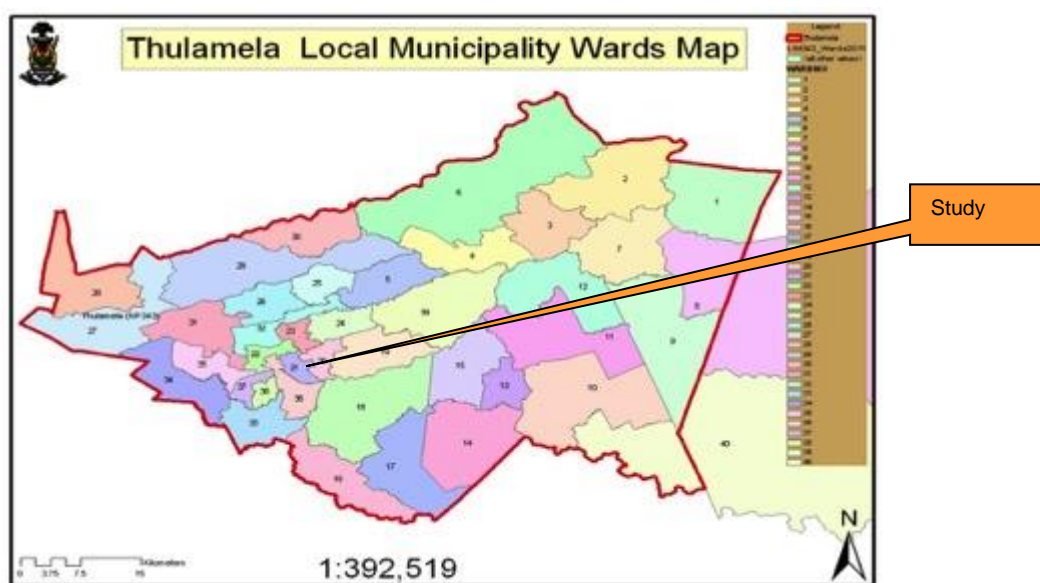


Figure 3.1: Mbilwi Village within the context of Thulamela Municipality

3.2.2 Situational analysis of Mbilwi Village

This section presents the geographical and socio-economic characteristics of Thulamela Municipality, including the vegetation, poverty situation, employment opportunities, social services and facilities; a demographic analysis has also been presented. Due to scarcity of rainfall and dry winters, the vegetation of Thulamela Municipality comprises of scattered vegetation, apart from Thathe-Vondo, which is in the mountainous areas of Thohoyandou (Integrated Development Plan Thulamela Municipality, 2010/11). The rainfall is usually in the summer (30mm to 60mm). There are also extensive areas within the municipality that are conservation areas among others, the natural protected areas which includes the Kruger National Park (IDP Thulamela Municipality, 2014). The temperature in Thulamela Municipality is very high, ranging from 34°C - 36°C in summer and this high temperature has a negative impact on the vegetation, (including Mopani trees, with which the Mopani worms are associated) (IDP Thulamela Municipality, 2014).

The population of Thulamela Municipality at estimated as 602 819 and constitutes 48.16 percent of the total population of the Vhembe District (IDP Thulamela Municipality, 2014). Indeed, it is the most densely populated Municipality in the District with few employed people, for example, most of the women depend on social grants. Mbilwi village (Figure 3.1) is located within ward 23 under Thulamela Local Municipality of Vhembe District and is bordered on the south by Sibasa Central Business District (CBD). It shares a boundary with Mutshundudi River on the northern axis. Mbilwi village borders Tshivhulani village on the eastern part and on the west by Ngwenani village. The climate is subtropical with rainfall ranging from 300-2000mm. During summer the mean temperature is 25^o C and during winter it is 15°C (Bureau, 1986). Matavhela village has a population of 475 people and is located in Mutale Municipality.

3.2.3 Situational analysis of Mutale municipality

Mutale local municipality is one of the four municipalities within Vhembe District Municipality. It is situated in the far north eastern corner of the district. It serves a population of 131 781, spread over 150 villages. The total land coverage of the municipality is 2375,78212 hectares. The Kruger National Park forms the eastern boundary of Mutale local municipality, with the great Limpopo river forming the north - eastern boundary. The municipality's strategic location affords it many opportunities for tourism development.

Mutale local municipality shares borders with Musina, local municipality and the Republic of Zimbabwe in the north, the Republic of Mozambique in the east, Makhado local municipality to the west and Thulamela local municipality to the south. The municipality is accessed through road R525 linking the Kruger National Park to the other local municipalities within Vhembe district. It can also be accessed through P277/1 linking Thohoyandou and Mutale. The study will be carried out in Mafukani village which has a total population of 1900 (figure 3.2) and it consists of five sub-sections which are Thondoni, Tshamutsindo, Tshipinda, Matavhela. Mutale municipality is the only local municipality without a hospital but it has health centres and clinics.

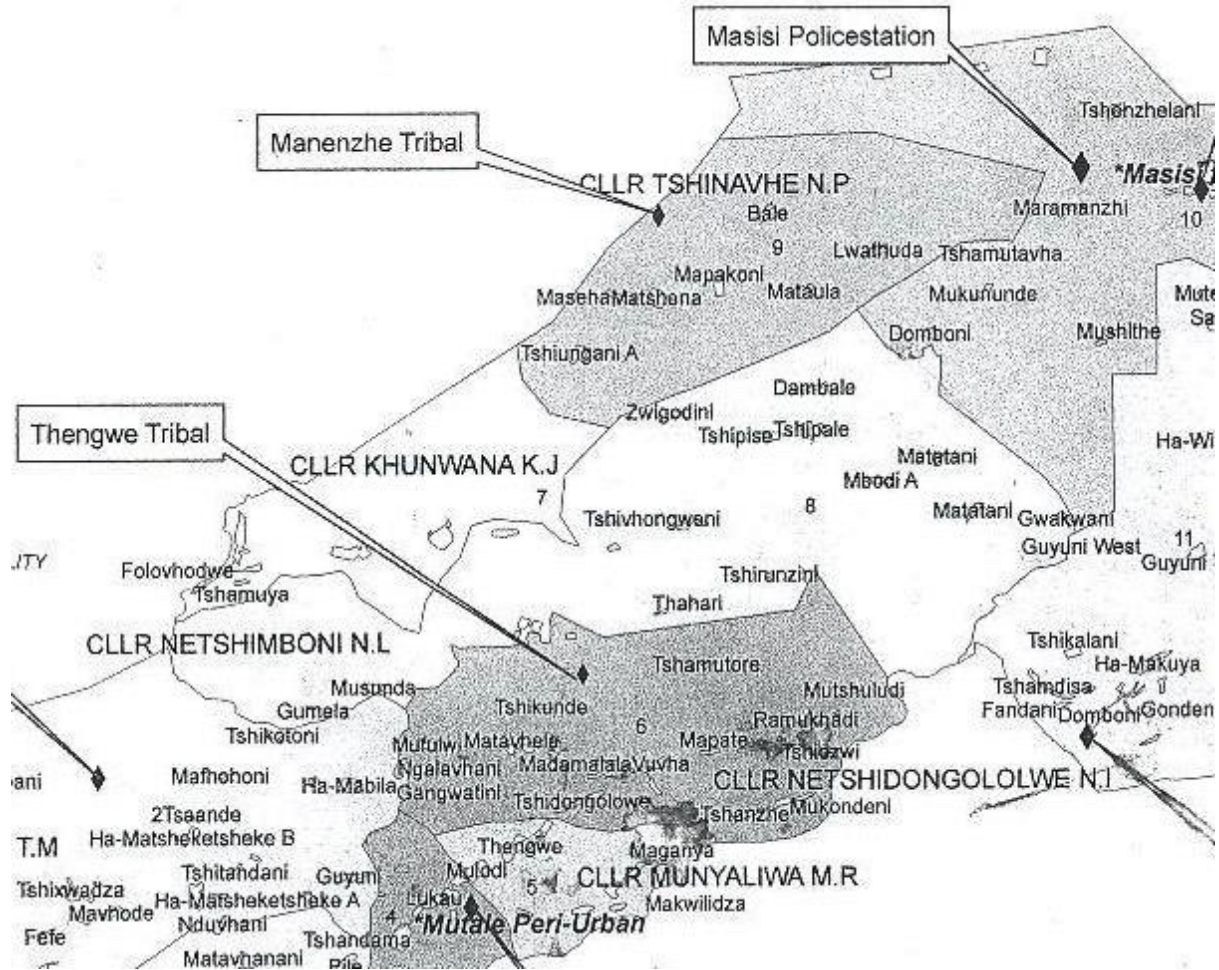


Figure 3.2: Map of Matavhela village within the context of Mutale municipality

3.3 Research Design

The study used both quantitative and qualitative methods/approaches. The quantitative method is one in which the investigator primarily relies on post positivism for developing knowledge (i.e. cause and effect thinking, reduction to specific variables and hypotheses and questions, use of measurement and observation, and the test of theories). The method also employs strategies in inquiry such as experiments and surveys, and collects data on predetermined instruments that yield statistical data (Creswell, 2003). Thus, to gather information about consumption patterns of people living in Mbilwi and Matavhela Villages the researcher used two methods to collect data;

- The first method used a food list to collect data pertaining to the frequency of which certain foods were consumed in each a household in a week
- The second method used a 24 hour dietary recall to collect information on foods eaten by the respondents in a 24 hour period (from the time they wake up to bedtime)

The qualitative method using open-ended inquiry enabled the participants from different households in these communities not only to reveal the type of food they consume but also the reasons behind their choices. A mixed analysis methods of data used thematic content and descriptive statistics, (frequency, graphs and tables) to present data.

3.4 Data Types and Sources

To gather data from the two selected villages, the study made use of both existing and the direct experiences of the respondents. Thus, both primary and secondary source of information were used. The secondary data was collected from various reports which among other includes the Department of Health and Social Development in Thulamela Municipality, Statistics South Africa, census reports, policy documents and research papers. Primary data was collected using a standardised pre-tested questionnaire administered among selected households in the study areas.

3.5 Population

Population refers to the total set of subjects or objects from which the study is being conducted and where the results will be inferred. The population of this study refers to the total number of people in Mbilwi and Matavhela villages. According to Census SA (2011), Mbilwi has 5077 and Matavhela has 4423 people living there. Therefore, the total population for this study is 9500, (N = 95).

3.6 Sampling Technique and Sample Size

The study used purposive sampling technique to select households from the Villages of Mbilwi and Matavhela. Thus, households were only picked from those willing to participate

in the study until a total sample of 97 households were selected (that is, 50 from Mbilwi and 47 from Matavhela). In each of the selected household, the head of the household was interviewed.

3.7 Data Collection

A semi structured questionnaire was used to solicit information from the participants. The questionnaire was administered by the researcher. The questionnaire was made up of closed and open-ended questions. The questionnaire gathered information which included:

- i. Demographic data,
- ii. Food consumption patterns (using a weekly food frequency recall questionnaire and 24-hour recall) of households in Mbilwi and Matavhela Villages,
- iii. Nutritional knowledge of households of Mbilwi and Matavhela Villages,
- iv. Nutritional and health linkage knowledge of households of Mbilwi and Matavhela Villages and,
- v. Socio-economic factors that influence the food consumption patterns of households living in Mbilwi and Matavhela Villages.

A pilot study was carried out to test the questionnaire to identify problems that might relate to ambiguities or wording. The questions which did not seem clear were amended after the pilot study. Testing for validity and reliability of the questionnaire was done to ascertain the quality of data collected. The pilot test revealed that the time spent on the questionnaire was adequate; that respondents understood the questions and where not clear, a local interpretation was necessary; the ethical standard on sensitive questions was clarified.

3.7.1 Data analysis

The quantitative data was analysed using the Statistical Package for Social Scientists (SPSS version 23.0) to generate descriptive statistics such as means, and percentages. Data was further presented in the form of charts, tables and graphs. Thematic content analysis was used to address and interpret qualitative data. Themes were generated from the data to generate units of analysis and based on the objectives of the study to enable

easy interpretation of qualitative information. This was done to understand the participants' view and behaviours in relation to their food consumption patterns.

3.8 Ethical Considerations

Firstly, the researcher asked for permission to conduct this study from the University of Venda Higher Degrees Ethics Committee (UHDC). This enabled the researcher to obtain ethical clearance to approach the Mutale and Thulamela municipalities to conduct the study in their jurisdiction (Appendix 6). Secondly, the researcher further consulted and asked for permission to conduct research study in both villages via the village chiefs. Furthermore, the members of the community who were randomly selected were handed information sheets and consent forms and were informed of their rights which included, to participate at will, the right not to complete the questionnaire if they are not happy with the content or felt that the questions asked are not proper and that they were not obliged to answer all questions. The data collection started after permission and consent had been obtained from the relevant respondents.

3.9 Chapter Summary

The chapter dealt with the methods that were employed in gathering data and how it was interpreted. Thus, the section gave an outline of the processes followed in doing the study.

CHAPTER FOUR: PRESENTATION OF FINDINGS AND DISCUSSION

4.1 Introduction

This chapter discusses the research findings from the questionnaire survey. The responses on the closed and open-ended questions are summarised and presented using graphs and tables from frequencies and percentages. A similar type of questionnaire was used for each household to collect data in the two villages: Mbilwi and Matavhela. The questionnaire comprised of different sections and the research findings will be presented in respective sections. The aim of the study was to assess the consumption of food patterns of selected households in Mbilwi and Matavhela villages. The data collected from the respondents was analysed using the IBM Statistical Package for Social Sciences (SPSS) version 23. Descriptive statistics such as frequency distribution and percentages were used to present the findings of the study. The data collected through the questionnaire has been divided into sections A and B. Section A captures the data collected as biographical data of the respondents while section B captures the nutrition and food consumption data collected from the respondents (households).

This chapter presents and interprets the data collected from households of Mbilwi and Matavhela villages in Thulamela municipality, Limpopo province of South Africa. Using thematic analysis, the results of the study are presented supported by Microsoft Excel. Graphs and tables are used to show the relationship of food consumption, nutritional values and preferred choices.

4.2 Study Respondents

Research respondents were selected villagers at Mbilwi and Matavhela villages. Detailed description of the respondents was presented in Chapter 3. Respondents gave insights on the food consumption patterns and factors that affect their choices.

4.3 Biographical Data Presentation

4.3.1 Gender

Table 4.1 shows the distribution of respondents by gender in both study areas. The results suggest that more females were interviewed in Mbilwi (64%) and Matavhela (57%) villages

respectively as compared to their male counterparts of 36 percent versus 43 percent. This is because most males were not at home. They were off-land as they are working far away from their homes.

Table 4.1: Gender distribution of the respondents

Gender	Mbilwi		Matavhela	
	No	%	No	%
Male	18	36	20	43
Female	32	64	27	57

Males leave their wives at home and mostly came back during holidays. Females are now heading the families, taking care of businesses at their homes and that is why they constitute a large number of the respondents.

4.3.2 Age

Table 4.2 shows the ages of the participants in Mbilwi and Matavhela villages. In Mbilwi a large proportion of respondents who participated in the study are aged between 46-55 (38%).

Table 4.2: Age of the respondents

Age	Mbilwi		Matavhela	
	No	%	No	%
19-21	4	08	3	6
22-35	8	16	13	26
36-45	8	16	14	26
46-55	19	38	12	24
56-65	6	12	1	2
Above 65	5	10	1	10

These respondents are recipients of Rural Development Plan (RDP) houses while in Matamela a large proportion are aged between 22-45 (52%) because their parents are working on farms while the young ones are at home taking care of the children.

4.3.3 Marital status

In these two villages in the study area, there is a large number of single headed households (i.e. single, divorced, and widowed).

Table 4.3: Marital status of the respondents

Marital status	Mbilwi		Matavhela	
	No	%	No]	%
Married	19	38	24	51
Single	13	26	16	34
Divorced	9	18	2	4
Widowed	9	18	5	11

Table 4.3 above shows married respondents were fewer in Mbilwi (38]%) than Matavhela (51%) whilst single headed families (single, divorced and widowed) constituted a large proportion in Mbilwi (62%) than Matavhela (49%). The single group included the child headed families where some of were orphans without both parents and those with one parent.

4.3.4 Highest grade attained

In Matavhela a high proportion (45%) of respondents have grade 12 compared to Mbilwi (24%). In Matavhela there is an intervention by the Chief and the business people which gives cash incentives to the best learners and best teachers. In addition, the community built more classrooms and one office for learners (Table 4.4).

Table 4.4: Highest grade attained by respondents

Highest grade	Mbilwi		Matavhela	
	No	%	No	%
1-4	9	14	6	13
5-7	5	10	8	16
8-11	17	34	10	21
12	12	24	21	45
No primary Education	9	18	2	4

The percentage of educational categories in Mbilwi were as follows: grade 12 was 24 percent and 18 percent had no formal education. The support and incentives from the business people and the Chief in Matavhela may have contributed to the increased rate of literacy in the area.

4.3.5 Post high school qualification attained

A larger proportion of people have a post high school certificate in Mbilwi (36%) than in Matavhela (28%) followed by those who have diplomas that is, Matavhela (21%) compared to Mbilwi (10%), those with degrees in Matavhela are 13 percent compared to Mbilwi 6 percent.

Table 4.5: Post high school attained by respondents

Post High School	Mbilwi		Matavhela	
	No	%	No	%
Diploma	5	10	10	21
Degree	3	6	6	13
Certificate	18	36	13	28

4.3.6 Occupation

In Mbilwi a large proportion of people are employed (44%) because the village is not far from the main town. People could walk a short distance to and from town where there are shops, factories and government offices. Unlike in Matavhela where the number of employed people are lower (40%). The self-employed and unemployed in Mbilwi are 48% while it is 60% percent in Matavhela. The high rate of unemployed and self-employed in Matavhela may be due to lack of business entities and shops around the village hence individuals are engaged in their own small businesses.

Table 4.6: Occupation of the respondents

Occupation	Mbilwi		Matavhela	
	No	%	No	%
Employed	22	44	20	43
Self employed	11	22	14	30
Unemployed	13	26	14	30
Other	1	2	2	4

Table 4.6 indicates that the self-employed and unemployed respondents are high both in Mbilwi (48%) and in Matavhela (60%). This meant that although there was a shortage of jobs which could contribute to lack of basic essentials such as water, food, clothing, and housing/shelter, there is an equal number of respondents that are self-employed and are able to meet their immediate needs.

4.3.7 Source of income

A large proportion of the respondents in Mbilwi (40%) depend on their salaries compared to Matavhela (36%). Other sources of income for both villages are child support grants and pension funds. A larger proportion of people in Matavhela are dependent on child grants, pension and other (45%).

Table 4.7: Source of income of the respondents

Source of income	Mbilwi		Matavhela	
	No	%	No	%
Salary	20	40	17	36
Salary and other sources	17	34	11	23
Child/pension grant	5	10	8	17
Pension grant and other sources	2	4	5	11
Child grant and other	6	12	08	17
Spouse			1	2

4.3.8 Total household's monthly income

In this section high percentage of respondents in Mbilwi earned between R1200-R2599 (34%) while in Matavhela only 26 percent earned as much. Table 4.8 indicates only the estimated amount earned by each household, as many respondents did not reveal the actual amount, meaning that they were negative. They were either trying to cover-up their source of income or money earned. The highest percentage falls under others which is 20 percent, followed by those who earned from R1200-2500, then followed by those who earned between R2600-R3599, R500-1199, R3600-5999 and R6000-7999 respectively. The lowest amount that respondents revealed was between R6000-7999, meaning there are a number of people who are earning low salaries just for survival and hence they cannot afford basic foods. The lowest salary range was between (R500-R1199) and 10 percent of the households in Mbilwi and 21 percent of the households in Matavhela were in this group (Table 4.8). A large proportion of the households in both Mbilwi and Matavhela were in the income group of R1200-R3599. According to the Central statistics figures for 2016 these people are living below the poverty datum level (Stats SA, 2016).

Table 4.8: Monthly income of respondents per household

Total Household monthly income	Mbilwi		Matavhela	
	No	%	No	%
R500-1199	5	10	9	21
R1200-2599	17	34	11	26
R2600-3599	10	20	10	23
R3600-5999	0	0	2	7
R6000-7999	0		1	2
Others	18	36	20	47

4.3.9 Number of people in a household

In this category, both villages has similar numbers of people in the household with 4-6 people in a household (42%), followed by 1-3 number of people in a household with 38 percent in Matavhela while Mbilwi has 40 percent. In both villages there were 18 and 20 percent of the households with 7-10 people residing in a household. Table 4.9 indicates that the highest number of people living in a household is 4-6 (42%) in both study areas.

Table 4.9: Number of people in a household

Number of people in the household	Mbilwi	Mbilwi	Matavhela	Matavhvea
	No	%	No	%
1-3	20	40	19	40
4-6	21	42	21	45
7-10	9	18	10	21

In these two villages a large proportion of the households has four to six people in a household. When the average income is compared to the number of people living in a household, the incomes are low to adequately meet their basic daily needs.

4.3.10 House ownerships

Table 4.10 indicates that house ownership in both villages was in an equal proportion (96%). The village people prefer to build their own houses rather than rental housing because they have enough space of open land than those who reside in town. Nevertheless, there is a similar proportion in both villages of households who are renting houses (4%). This is due to some people who came to work in that particular area where they are also residing. In South Africa, there are three housing option for households to make a choice, that is building, rental and buying.

Table 4.10: House ownerships of the respondents

House ownership	Mbilwi		Matavhela	
	No	%	No	%
Own	48	96	45	96
Rental	2	4	2	4

When interviewing the respondents, some were not interested to reveal whether they were owning or renting the houses. According to their responses, majority of the people own their houses and they said those who usually rent are mostly found in urban areas or reside in a city centre where they live near their places of work.

4.4 Types of Food Consumed by Households in Mbilwi and Matavhela Villages

There are a number of foods consumed in the villages under study. The foods consumed are in the groups of carbohydrates (cereals and starches), proteins (meat and legumes), fruits, vegetables, milk and milk products. Foods are consumed or not consumed because of various socioeconomic factors. The following section presents the findings from the weekly food frequency questionnaire. The aim was to obtain retrospective information on patterns of food consumed in a week in order to assess the usual intake of foods and specific food groups.

4.5 Weekly Food Consumption Patterns of Selected Foods

4.5.1 Carbohydrate

The weekly food consumption pattern revealed that the carbohydrate food group is the most frequently eaten food, seven times a week (Figure 4.1). Vegetables, fruits, milk and milk products, meat and legumes are eaten mostly once a week. Although there are indigenous vegetables and fruits available in the villages, their consumption is less frequent compared to the consumption of the carbohydrate food group. This may be due to the fact

that people engage in daily activities that require a lot of energy. King and Burgess (2000) indicate that starches are the main source of carbohydrate in cereals such as, rice, maize, bread, and wheat.

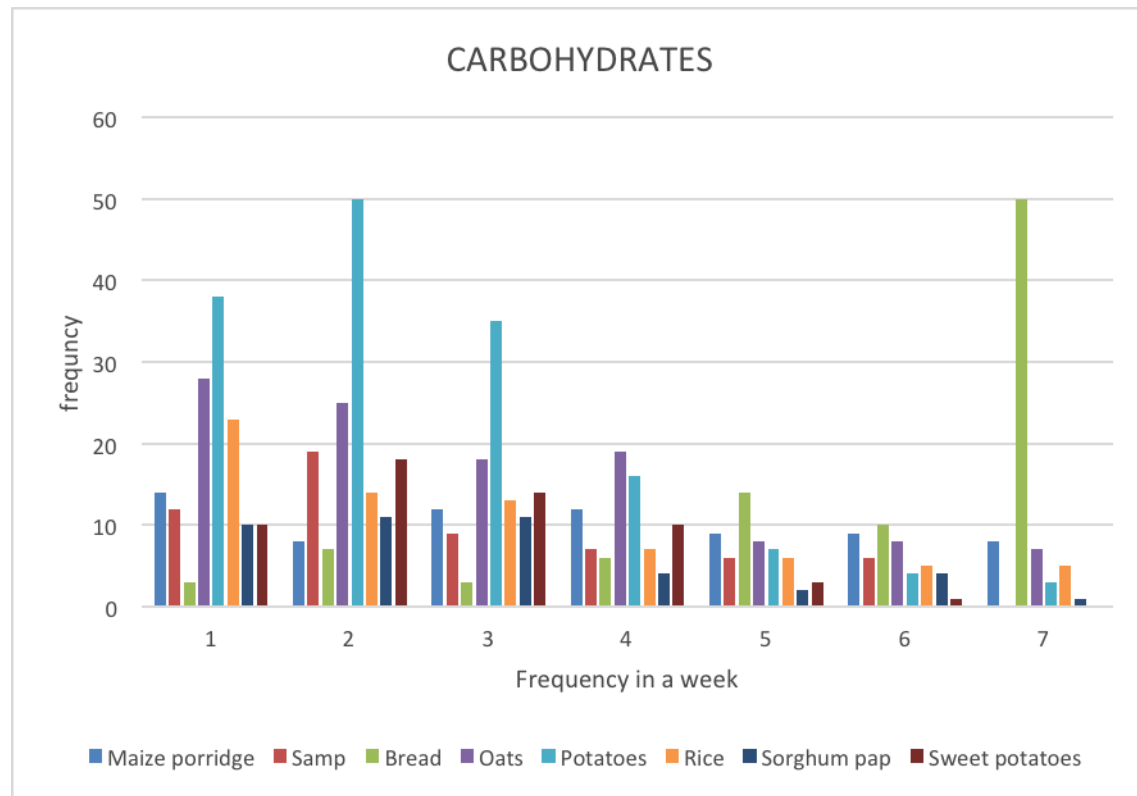


Figure 4.1: Weekly consumption of carbohydrates in the selected villages

Figure 4.1 shows the distribution of carbohydrate giving foods as consumed by Villages of the study area during the time of data collection. This study revealed that the type of carbohydrate food eaten the most is maize meal (*pap*) which is eaten seven times in a week by the majority (60% of the time in a week) of the respondents. This could be because maize meal (*pap*) is the staple food eaten in the Vhembe District. Supplementation of this food group with other food groups like vegetables and fruits, which have important minerals and vitamins, is imperative because many of the households need to understand issues about balanced diet to stay healthy (Waterfront Media, 2008).

4.5.2 Vegetables

Vegetables are nearly all rich in carotene and vitamin C which contain significant amounts of calcium, iron and other minerals (Boulos *et al.*, 2014). An increase in the consumption of green leaves and other vegetables could play a major part in reducing vitamin A deficiency, which is often prevalent in children, and could contribute to lessening the prevalence of iron deficiency anaemia in all segments of the population, especially in women of child-bearing age (Boulos *et al.*, 2014).

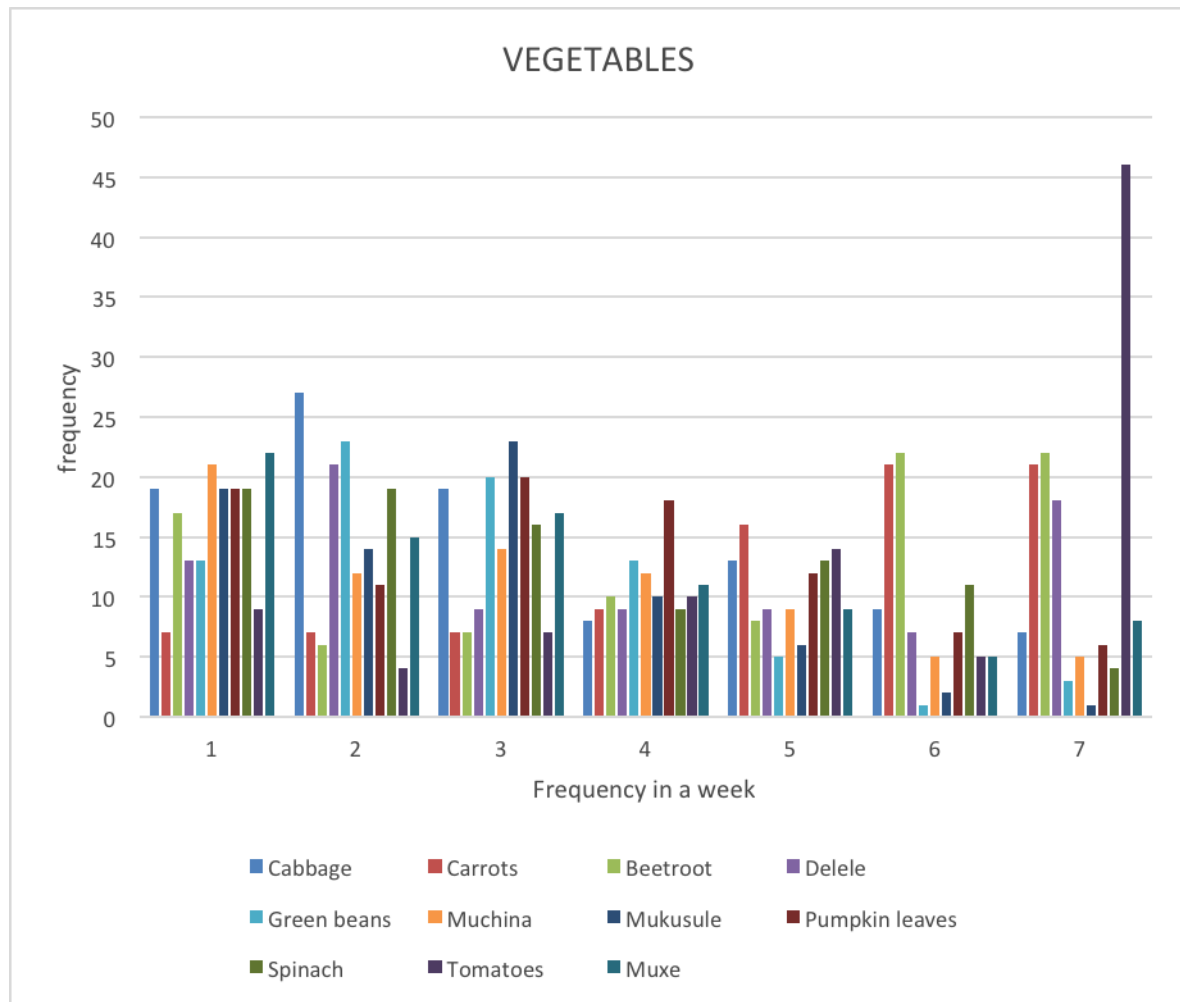


Figure 4.2: Weekly vegetables consumption at Mbilwi and Matavhela

This study revealed that vegetables were also consumed as part of daily meals, mostly as relish. This study revealed that a high percentage of households eat vegetables at least two

to four times per week. Figure 4.2 shows the weekly vegetables consumption of selected vegetables at Mbilwi and Matavhela Villages. About 37 percent of the time in a week, vegetables are eaten once per week while a small proportion of the households did not eat vegetables at all. This may be because vegetables such as Chinese spinach (*muchina*), tomatoes, pepper, onions cannot be eaten alone, except along with other food items and if those accompanying foods are not available then vegetables are abandoned. Hence the combination of vegetables (such as cabbage, carrots, *muchina*, pumpkin, beetroot leaves, *muxe* and other) and carbohydrates can improve the quality of meals consumed by the respondents. A well balanced diet can contribute to the health and wellbeing of people taking such meals on a regular basis.

4.5.3 Fruits

The main nutritive value of fruits is their content of vitamin C. Fruits contain very little fat or protein and usually no starch (Chepape *et al.*, 2014; Chen *et al.*, 2015). Most experts agree that a person should eat at least three fruit servings a day. One fruit serving should be a citrus fruit such as oranges to ensure there is an adequate supply of vitamin C. Fruits are also a great source of beta carotene and fibre. The study revealed that bananas are eaten at least once a week even though they are always in season whilst other fruits are eaten sparingly or not at all. A wide variety of fruits grow wild or are cultivated in Vhembe. The variety available at any time in each area depends on the climate, the local tastes for fruit, the species cultivated and the season (Chambers, 2014; Chepape *et al.*, 2014). However, their consumption is not satisfactory in the study.

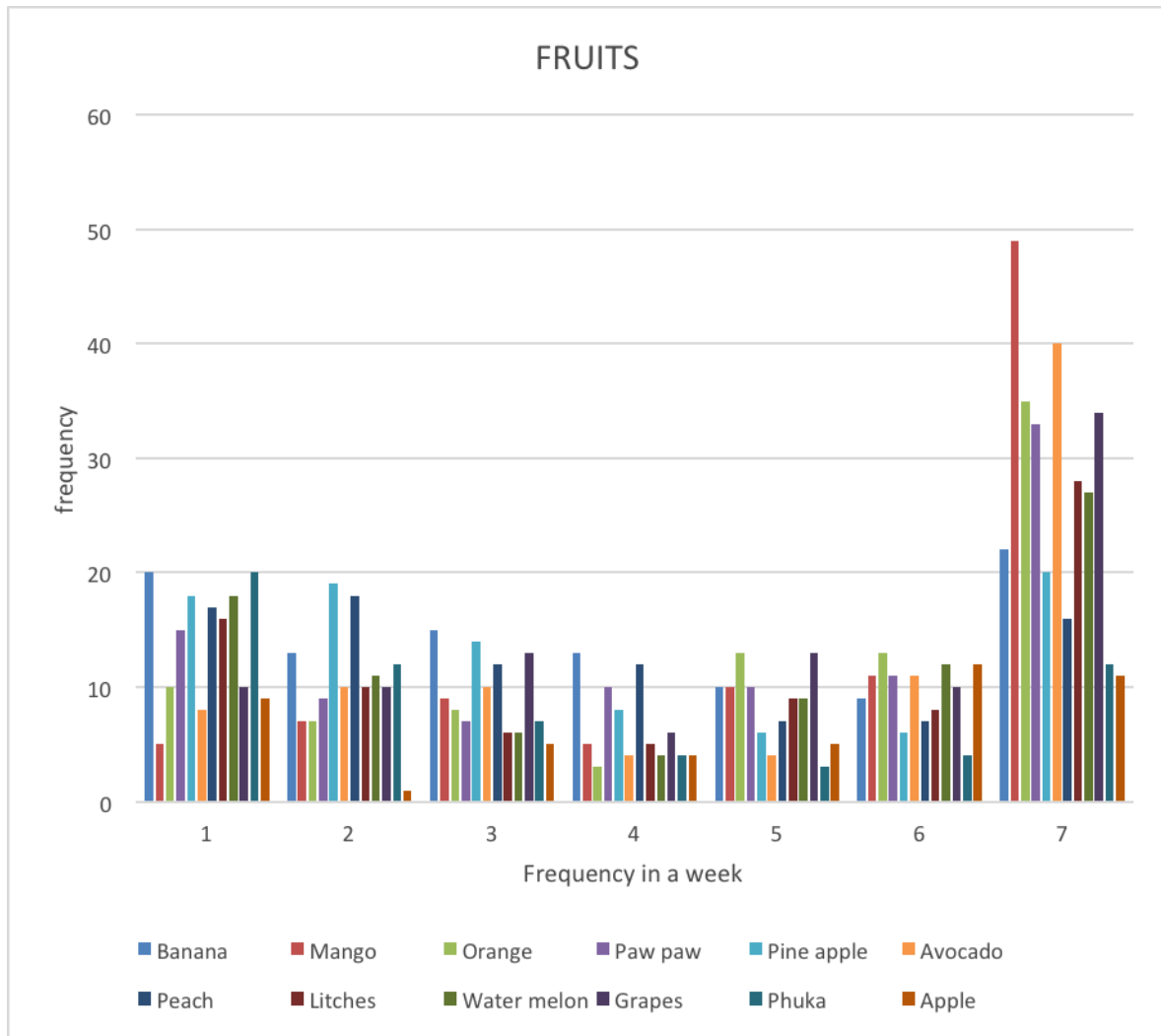


Figure 4.3: Weekly household consumption of fruits at Mbilwi and Matavhela

Fruits like watermelon are eaten by very few households once a week. This may be because only few households plant the crop. Fruit and vegetables contain so many healthy benefiting protective nutrients. A typical example could be eating an apple, an orange, half a cup of grated carrots, a green salad and drinking a glass of fruit juice to obtain the recommended five servings a day. Many people are not aware about the importance of eating more of this food group even though they sometimes have them in abundance. This presents an opportunity for creating the awareness of the value of such foods for household consumption. The fruits consumed were those in season such as bananas, mangoes, avocado pears, pawpaw, oranges, pineapples and others (such as wild fruits). The weekly consumption frequencies of the fruits was low and as shown in Figure 4.3.

4.5.4 Milk and dairy foods

Milk and other dairy products are highly nutritious and can play an important part in human diets for both children and adults (Darmon and Drewnowski, 2015). Milk and dairy food group consists of milk and milk products, such as yoghurt and cheese. Figure 4.4 shows that very few households drink fresh milk once to three times per week while only a small proportion drink fresh milk seven times per week.

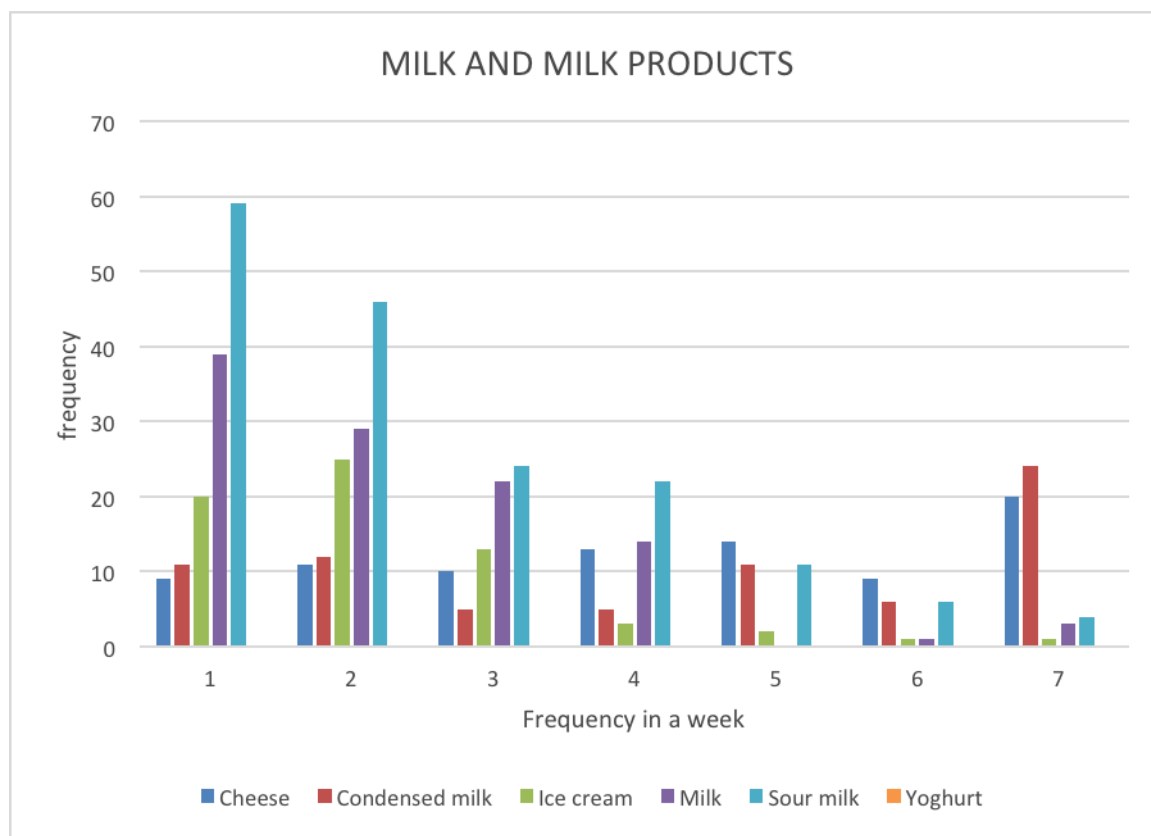


Figure 4.4: Weekly household consumption of Milk and milk products at Mbilwi and Matavhela Villages

Although milk is a good source of vitamins and minerals, only few can afford to use it everyday due to poverty. This may be one of the reasons why many households seldom use milk and milk products in their daily diet. Other reasons may be the long distances of households from the shops where these commodities are sold. In addition, many of these

products need to be kept in a cool environment for example in a refrigerator which is not available in most of the homes of these households. The absence of the refrigeration equipment might present a challenge in consumption and storage of such dairy products.

4.5.5 Meat and legumes

The findings in this study agree with the findings of Fahmida *et al.* (2015) which state that foods of animal origin are not essential for an adequate diet, but they are a useful complement to most diets, especially to those in developing countries that are based mainly on a carbohydrate-rich staple food such as a cereal or root crop. Meat contains about 19 percent protein of essential quality and iron that is well absorbed (Higgs, 2015). A third of the households consume meat and legumes at least once or twice a week. This can be linked to financial capabilities of the households. Chicken, chicken head and feet, chicken intestines, beef offals, beans and soya mince are the most commonly eaten in this food group (Figure 4.5).

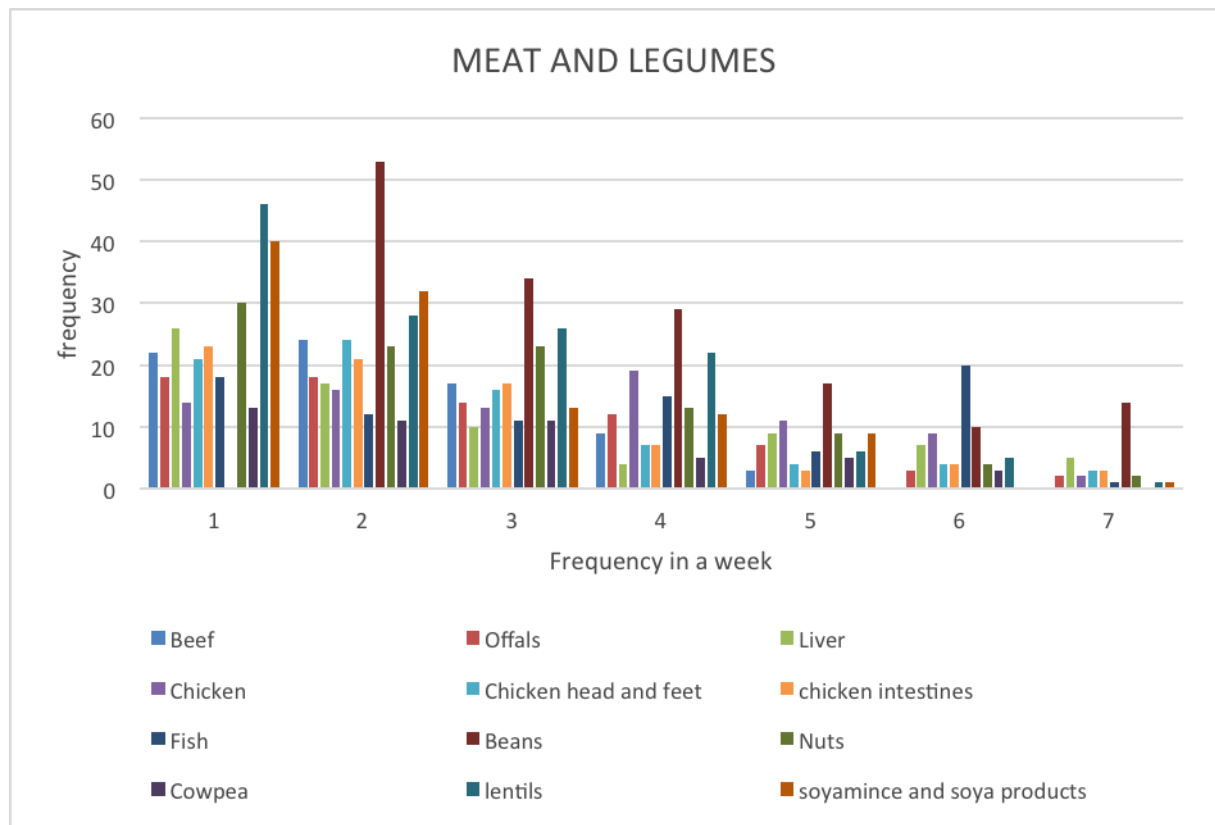


Figure 4.5: Household consumption of Meat and legumes food group per week

However, during holidays and other family events, livestock such as goat, sheep or chickens may be slaughtered and enjoyed by the families. Micronutrient and/or protein deficiency is present in a very large group of malnourished people (Malnutrition Matters, 2009). They either do not receive adequate amounts of vitamins and minerals (micronutrients), or the correct proportion of protein in their diets. This can have very debilitating effects on people and societies. The health symptoms may not be immediately visible to either the individuals themselves or to health workers, or they take years to manifest. The result is lost productivity, and a great increase in health care costs which negatively affect other government attempts to improve the quality of life - aside from the enormous social cost.

4.5.6 Summary of food consumption in the study area

It was observed that a large percentage of households in the study area met the requirements for food serving frequency per day for the carbohydrate food group but they failed to meet this requirements in other food groups (Figure 4.6). They were choosing food based on the food availability which is often linked to income. Availability of certain foods like fruits and vegetables depend on the seasons of the year. Fruits were consumed in the study area because variety of fruits were in season during data collection, these are mostly eaten during weekends. Other foods like milk and dairy products, meat and legumes depend on the household's purchasing power.

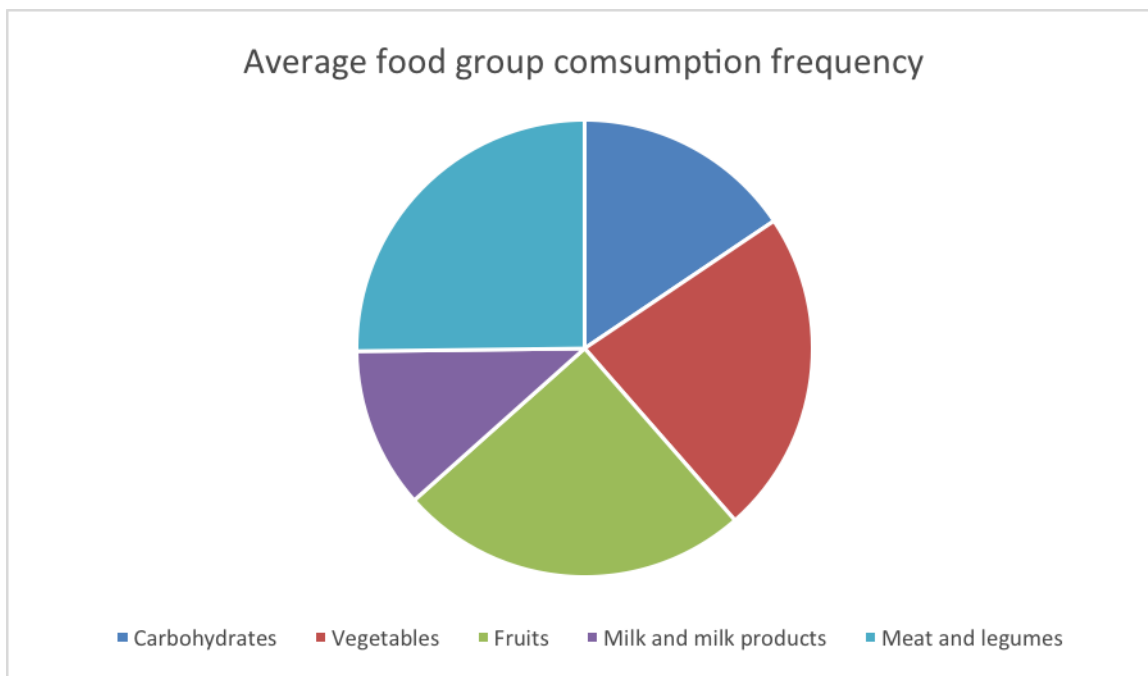


Figure 4.6: Summary of food group consumption frequency

4.6 Nutritional Value of Foods Consumed at Mbilwi and Matavhela Villages

Although some Mbilwi and Matavhela households consume variety of foods as part of their diet, energy giving foods were the most consumed. This is because most of the households do a lot of physical work that requires a lot of starch giving foods for example pap, potatoes and rice. This is in agreement with the findings of Hirvonen *et al.* (2017) who says carbohydrates give energy. Fruits, vegetables and meat are used to complement the carbohydrates as relish.

4.7 Nutritional Knowledge of Households Living in Mbilwi and Matavhela Villages

A healthy society is necessary for the growth of children (Younes, 2014; Wang *et al.*, 2014). For example, they frequently indicated the need of energy required to carry out their daily activities and the type of foods they need to eat (potatoes, maize porridge, bread and rice). A varied diet has healthy benefits and is vital to the human body. In this section, questions were asked to find out the amount of nutrition knowledge possessed by the respondents. The respondents' responses revealed that they had some nutritional knowledge about the foods they consume and this is summarised in table 4.11. The knowledge was mostly from

media (TV, radio, leaflets and internet) other sources of nutrition information were from group interaction (meetings, church, clinics, nurses and doctors). It is believed that knowledge of what to eat and in what quantities is a prerequisite to a healthy and happy life. Most respondents were also able to list diseases related to foods they eat. Healthy eating and regular physical activity not only prevent but are also used in the treatment of a variety of chronic conditions such as coronary heart disease, hypertension, diabetes, obesity, and osteoporosis (Food Group Report, 1995). These findings confirm that even though balanced diets are not fully implemented in most households due to various socioeconomic reasons, the situation changes when they have access to nutritional knowledge.

Table 4.11: Nutritional knowledge of the respondents about food

Foods that are good for health/foods to be in a balanced diet	Foods that are bad for health	Diseases related to foods we eat	Sources of nutritional information
Milk	Red meat	High blood pressure	Clinic
Green leafy vegetables	Junk foods	Kwashiorkor	Radio
Maize porridge	Fatty foods	Diabetes	TV
Rice	Salty foods	Obesity	Leaflets
Different types of fruits	Sugary foods	Marasmus	Nurses/doctors
Banana	Mopani worms	Ulcers	Internet
Apple	Sweets	Gout	Church
Amaranth	Potato chips	Kidney failure	Chief kraal
Meat		Heart attack	Meetings
Beans			
Spinach			
Indigenous vegetables			
Cornflakes/weetbits			
Egg			
Brown bread			
White bread			
Fish			
Sweet potatoes			

Table 4.11 shows the respondents' understanding of balanced/unbalanced food and diseases relating to food in their community. The diseases mentioned included high blood pressure, kwashiorkor, diabetes, obesity, marasmus, ulcers, gout, kidney failure and heart attack. In addition, the households were able to identify foods that are bad for their health.

The respondents have shown that they know which foods are to be in a balanced diet although they were not necessarily including these foods in their diets due possibly to different socio-economic factors (Reville, 2011). This result is in line with the findings by Bordi *et al.* (2002) which confirm that people eat unhealthy food because they like them.

4.7.1 Most important meal preferred in a day

In table 4.12, a large proportion of people prefer to eat breakfast and lunch but skip supper while others may eat lunch only and skip the rest. About a third of the households eat lunch in Mbilwi and Matavhela Villages (28 and 34%) respectively.

Table 4.12: Most important meal eaten in a day by respondents

Most important meal in a day	Mbilwi		Matavhela	
	No	%	No	%
Breakfast	17	34	12	26
Lunch	14	28	16	34
Super	7	14	10	23
Other/combination	12	24	12	26

A third of the respondents in Mbilwi (34%) and Matavhela (26%) considered breakfast to be the most important meal of the day. In both villages, a combination of breakfast/lunch/and supper were considered to be most important meals in Mbilwi (24%) and in Matavhela (26%).

4.7.2 Amount of water to drink in a day

Table 4.13 shows the number of glasses of water a person need to drinks per day. A large proportion (32% in Mbilwi and 36% in Matavhela) of respondents indicated that a person

must drink 7-8 glasses of water in a day. According to Sharma and Wagner (2004), it is recommended that a person drink 7-8 glasses of water in a day and this is in agreement with a third of the respondents.

Table 4.13: Glasses of water to drink in a day by respondents

Glasses of water to drink (235 ml)	Mbilwi		Matavhela	
	No	%	No	%
1-2	1	2	4	9
3-4	15	30	10	21
5-6	10	20	10	21
7-8	11	22	17	36
Other	13	26	9	19

4.8 The 24-Hour Food Recall

In the 24-hour recall method, respondents are asked to recall the exact food intake during the previous 24-hour period or preceding day (Gibson, 2005: 41). Food frequency information from 24-hour recall has been used by Kant *et al.* (2000) to show that recommended food score (RFS) was inversely associated with all-cause mortality. Most people ate food much in carbohydrates and starch which is eaten 364 times in 24 hours. However, experts in the field of nutrition say that this food is good for energy whilst the excess starch is stored as fat in our bodies (Reville, 2011). This is not healthy especially if the person does not exercise regularly. According to King *et al.* (2007: 1373), “exercise may stimulate the appetite” so that persons who exercise increase their eating and do not lose as much weight as expected.

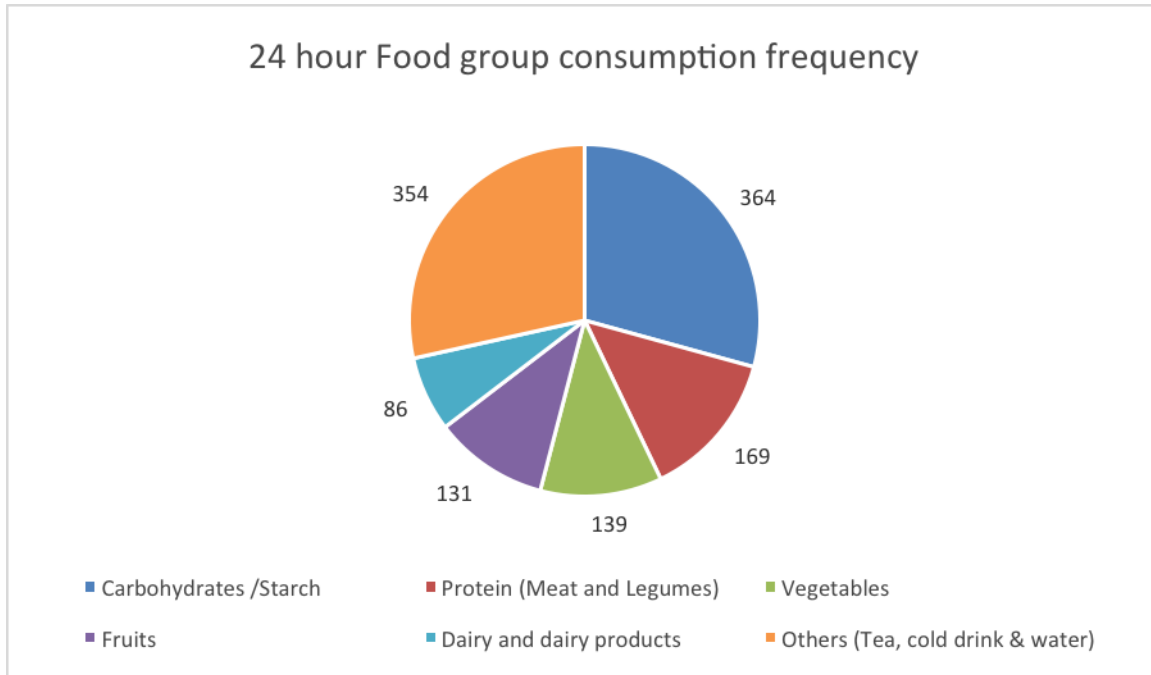


Figure 4.7: 24-hour food recall frequency of the study area

Figure 4.6 shows the 24-hour food recall of a combined population of Mbilwi and Matavhela. The 24-hour recall revealed that the respondents did not frequently eat some food groups. Foods that were consumed frequently were the carbohydrate group followed by the sugary/cold drinks group. In all the respondents, there was low consumption of fruits, vegetables, and dairy and protein groups. The protein group had a frequency of 169. The consumption frequency of dairy products at 86 was the lowest. A larger portion of the sugary group (354) is consumed compared to fruits and vegetables. The findings revealed a deviation from the recommended food guidelines shown in the figure 4.7. Although different countries use different food group guidelines the selection of a healthy diet requires that there should be variety in the food consumed. The study revealed that eating habits and food consumption patterns of the households interviewed in Mbilwi and Matavhela are influenced by different socio-economic factors as described below.

4.8.1 Factors influencing 24-hour food consumption recall

The food consumption patterns of the households are influenced by many factors. Household food security depends on nutritionally adequate and safe food supply (Seligman & Schillinger, 2010). At the household level and for everyone, a fair degree of stability in the food availability to the household both during the year and from year to year, and access of each family member to sufficient food to meet nutritional requirements is important (Ballari & Barrios-García, 2014). It is also important that the available food be both safe and of good quality. Social factors and cultural practices such as habit, financial capacity and religious beliefs in most countries, have a very great influence on what people eat, on how they prepare food, on their feeding practices and on the preferred food. Households indicated that there are different socio-economic factors that influenced their food consumption patterns. This finding is in agreement with the one by Turrell and Kavanagh (2007) which shows that people with low levels of education, and those residing in low-income households, were least likely to purchase foods that were comparatively high in fibre and low in fat, salt and sugar.

4.8.1.1 Eating habits from parents

In most households, the eating habits of parents filter down to all the members of the household. What their parents like becomes the regular meal according to some respondents in both study areas. Children and other people change very little to influence their eating habits. There are some habits passed on to the next generation by parents. Other habits were passed onto the next group through education or social networking, for instance, *Vhavendas* teach their children how to prepare certain foods and after eating this food for some time, it became a habit. Rastafarians do not eat red meat but rather eat more vegetables (Dumbrell, 2008). This has become their way of life and it is now a habit. About 15 percent of respondents from both villages were influenced by this factor.

4.8.1.2 Food affordability and food available

The issue of availability of money was also a major factor that influences or determines food choices in the households. About 36 percent of respondents from both Villages were

found to be lacking money to buy food for the family (Turrell and Kavanagh, 2007). Therefore, whatever little money was available was set aside for the purchase of food. The respondents in this category from the study areas were a considerable number of people.

Most respondents from both villages indicated that they have various reasons for food that they consumed the previous day (24-hour food recall) and one of the reasons expressed was the availability of food. People tend to eat different kinds of food especially, during wedding ceremonies, funerals, meetings, baby showers, parties and conferences. Another reason which affects their eating habits is the availability of money; people eat different unhealthy foods when they receive their salaries.

About 17 percent of respondents from the study areas were found to enjoy any food that came their way. They would eat because the food is available. There is no particular routine followed. This kind of eating may cause obesity or weight gain (Martin-Biggers *et al.*, 2014). According to one respondent from Mbilwi Village:

“If I have money to buy food, I eat together with the whole family.”

The study found that 57 percent of respondents' eating habit in both villages was affected by availability and affordability. When their budget is less, the quality and the variety of foods consumed would be affected. This finding is in line with Bargiota *et al.* (2013), who reports that household's monthly budget influences the respondents eating habits. Respondents from the study areas highlighted that when their finances are limited, their food choices are prioritised on major food items. Majority of respondents from both villages do not have formal employment, therefore survive on social grants and remittances from their family members in the metropolitan. Some respondents indicated that they partake in stockvels as a saving technique. This improves their food purchasing habits and choices. Availability of food in certain seasons also affects the food consumption patterns. For example, legumes, green maize and melons are mostly consumed during harvest time when there is abundance. According to a respondent from Matavhela Village:

“I sometimes buy my favourite food (preference), I prefer to eat food that I favour most when I get money from the stockvels. Every season comes up with its own food especially fruits and vegetables. In different season, I consume different fruits and vegetables. Most of the food available at that particular time, influences my eating habit.”

These forms of income to respondents seem not sustainable as in most cases it does not sustain them for the whole month. For example, one of the respondents from Mbilwi Village reiterated that they received their social grants and maintenance money which they use for purchasing food, however it doesn't sustain them for the whole month. This was identified as one of the challenges affecting the choice and patterns of food consumptions in the study areas. Another respondent from Mbilwi Village indicated that the food they buy is determined by the money they get hence the patterns are also affected. According to her:

“Insufficient amount of money makes us buy little food even though we are many at home.”

Respondents from the study areas indicated that poverty is the main factor that affects their eating habit because some people eat surplus of maize porridge (pap) early morning (for breakfast) instead of consuming cereals, milk and dairy products. Their main aim was to keep their stomach fuller for longer. Some respondents drink tea and bread instead of taking heavy meals and in between the meals they do not take fruits. They eat pap again for supper mostly accompanied by achar because they can afford to buy 10kg of achar. Some respondents survive by doing piece jobs so when they get paid they buy different food but mostly they do not change much on their eating habits. When money is limited, they tend to skip meals or eat one meal in a day especially when there is no food in the house.

Respondents from the study areas indicated that they based their eating habits on what they can afford and this depends on when they get paid and when they work overtime. Some people target special/promotional sales before they can buy a variety of food. When they get paid or have money, some prefer to eat from the restaurants. People tend to change their eating habits because they have money to buy variety of food. Some respondents indicated that they change their eating patterns for example, they eat rice mostly instead of porridge. According to the respondents, they change their eating pattern depending on the amount of money available at hand, it is then that they buy from fast foods outlets. But if they don't have money they reduce the size of their meal while some go to bed on empty stomachs. Respondents from the study areas indicated that when money is available they buy variety of foods like legumes, fruits and vegetables. Some people also

indicated that they are being controlled by the money that they have or do not have. The study of Turrell and Kavanagh (2007) confirm this with their findings which suggest that socio-economic differences in food purchasing behaviour may contribute to the relationship between the socio-economic position, food and nutrient intakes, and by extension to socio-economic health inequalities for diet-related disease.

4.8.1.3 External environmental influences

The environment is a very important factor that influences eating habits. An environment with plenty of food tends to influence the desire for people to eat a lot. About 12 percent of the respondents confirmed this assertion while little food in the working environments meant people ate less. People who attend workshops and functions like weddings tend to eat a lot because food was plentiful. If there is a funeral serving a limited amount of food, this may only be attended by a few people. Where food is abundant some people may not eat a lot but some would eat as much as they can until they can eat no more. In cases where food is scarce, people do not have any option but to eat the little that is available at the time. Under this category, the environment in which they lived had an influence on 7 percent of the respondents from the study area were influenced by. Friends had little influence over very few people's eating habits. About 3 percent of the respondents believed that when they were in the company of friends or were at a family gathering they tend to eat a lot of food. They said the fact that you will be talking and laughing makes you eat a lot of food. They said, there is some kind of urgency to outdo the others and hence they eat more food than they normally do when they are alone.

Respondents from the study areas highlighted that work conditions determine the type of food they must consume. About 27 percent of the respondents showed that they eat in order to gain energy to work for their families. This was indicated when one of the respondents from Matavhela Village who works at the construction company indicated that his environment forces him to eat a lot of carbohydrate foods because of the need for energy at work. He said:

“Matavhela is a developing village, the environment that I am in forces me to eat food that is available because of the construction work I do. I must have power to do the job, power comes after eating starchy food.”

Eating habits are influenced by the nature of work and what the consumer spend time doing, their age and culture. Respondents said, children would need a lot of energy giving foods because of their hyper active nature. This also applies to individuals who are involved in hard labour that requires consumption of energy giving foods. In this instance, carbohydrates become the best source of energy for them.

Respondents from the study areas indicated that their work environment forces them to consume different types of foods, for instance working with different colleagues from different spheres of life may introduce them to eating staple food and different foods from other countries. Some people indicated that they have eating rosters at work with different foods. Some respondents indicated that they depended on piece jobs for survival, and their work schedule makes them eat out every time. Work conditions makes some people eat food that is available and accessible at different occasions (salads, sushi, prawns, etc). When there are functions like conferences, parties, and/or funerals they eat a lot and they sometimes carry the surplus food home.

Most people in the study areas indicated that they are used to eating with friends and relatives while some people indicated that when given their favourite food (like samp), they can consume it from morning until night. This may be due to the fact that they cannot always prepare it at home like their staple food. Some respondents explained that when they have visitors they use this as an occasion to “spoil” themselves because they are given free food. One respondent from Mbilwi Village indicated that when one of her children and family members come for a visit from Johannesburg, she may buy food for their homes and nice food will be prepared for her by her daughter-in-law.

4.8.1.4 Influence of appetite

To some respondents anxiety is the driving force that influences their eating habit and their desire to eat more food. A large proportion (37%) of respondents confirmed that their appetite influenced their habits.

Respondents highlighted that appetite stimulates the desire for the type of foods they consume. More than 35 percent indicated that their eating habits were influenced by appetite. A good appetite was identified as the major cause for good eating habits (Donini & Savina, 2003). Some respondents from the study areas indicated that appetite could be the main factor that may affect their individual health. This is because one would eat whatever

they feel they want without considering the side effects, costs and other factors. They said, it would take exercise of discipline for people to attain good health and long life with what they eat. The study further revealed that appetite is influenced by the state of mind of a person. According to one respondents from Matavhela Village:

“I love to eat too much and I really like it. Appetite helps me to eat everything and it influences my eating habit, when I have appetite I eat a lot. Anxiety is the driving force which influences my eating habit and zeal to eat food also influences my eating habit.”

Respondents said that another factor that influences them was the favourite foods they enjoy eating that stimulate them to eat more if they are offered. Some respondents indicated that they normally change food according to the days, they don't eat the same food everyday. The eating roster is another factor that influences their eating habits even though they are not using it regularly but sometimes they change their diet whilst some respondents indicated that they don't have an eating roster, they just eat at home.

4.8.1.5 Health conditions

About 16 percent of the people believed that they ate food in order to stay healthy. This means that good food, which is a balanced diet, is needed for people to stay healthy. Some respondents even cited diseases they suffer from, for example, anemia (low blood level) was a result of their wrong food choices. They said in order for them to be well, they need food that is rich in iron. For those that are suffering from hypertension they need food with less salt.

Respondents in the study areas (3%) indicated that their health conditions contributed a lot to their eating habit when it comes to the choice of food. They said after their doctor gave them advice not to eat certain food items like salty foods, fatty foods and others, they became choosy. They said a healthy body is productive and has energy to do work therefore, good food leads to good health and wellbeing. About 18 percent of the respondents indicated that their eating habits are influenced by their healthy lifestyle. A respondent from Mbilwi Village indicated that health practices sometimes determine the types of foods to be consumed. According to her:

“I reduced some of my favourite food because of my health conditions. To maintain my body, I should eat with the aim of being healthy. I consider my health first when choosing food to eat.”

A number of respondents indicated that they eat a variety of foods to stay healthy and this influences their eating habit. Some people said they eat vegetables and fruits for health reasons. Some even mentioned that they know how to balance their diet and that is why they eat variety of food. Some respondents said that at month-end, they buy variety of foods but during the month, they reduce the way they eat because they could not afford to eat same food everyday hence they sometimes change to control their spending and weight. Some respondents also indicated that they eat certain food even though they are not of good quality because of their allergies whereas local fruits, vegetables and legumes are eaten because they are not expensive to buy. Some respondents indicated that health conditions to a large extent, influence their eating habits.

About 5 percent of people from the study area confirmed that Doctors who are specialists in their fields play a major role in determining the food quality and quantity that a patient should take. Some respondents' with health conditions such as diabetes or hypertension did not eat much food and also only ate certain foods that do not increase the amount of sugar in their blood or jeopardise their health. Poor diet and physical inactivity are key drivers of the obesity pandemic, and they are among the leading causes of preventable death and disability in nearly every country in the world (Gorski & Roberto, 2015). As countries grapple with the growing obesity prevalence, many innovative policy options to reduce overeating and improve diet quality should be prioritised. Certain medical conditions make some respondents selective of the food they eat in order to avoid worsening their health conditions. According to the respondents in this category, most of them attributed their health conditions to their weight increase hence they have been advised to cut down on starchy foods so as to reduce their weight. This findings agrees with the one by King *et al.* (2007) who believe that too much starchy food is a major cause of obesity. Some respondents maintained their weight by not eating too much food.

4.8.1.6 Seasons

The research found out that some respondents (21%) ate fruits and vegetables that were available on seasonal basis. These foodstuffs are rich in nutrients necessary for sustaining people's health. Some respondents even try to preserve these seasonal foods so as to enjoy them over a long period of time.

There are usually plenty of fruits and vegetables during summer hence they eat a lot of them. During winter, there is a shortage of fruits and the available ones are very expensive hence, they hardly eat fruits and vegetables during this periods. Respondents said that another factor that contributed to their eating habit was that some of them target seasonal changes (promotional sales) so that they could buy plenty of seasonal food for their households. During summer, fresh maize and maize usually become their staple food as it is affordable and usually in abundance.

4.8.1.7 Not having enough time to prepare food

One of the factors that influence eating habits is the availability of time to prepare meals. Some respondents indicated that lack of time hinders them from preparing food at home as they usually come late from work and tend to eat in restaurants where they are often served junk food. Some respondents indicated that certain foods which may not necessarily be junk foods are not their favourite foods to eat. Both busy work schedules and poor time management, are the main factors that hinder people from preparing food at home.

4.9 Other factors influencing food consumption patterns

The findings revealed that respondents in both Mbilwi and Matavhela Villages were consuming large proportion of the foods from carbohydrates group such as maize meal porridge, samp, potatoes, sweet potatoes, sorghum and pap. This was followed by meat and legume group such as chickens, beans, beef, chicken offal, chicken heart, gizzard, head and feet and soya products. There was low consumption of vegetable such as cabbage, beetroot, *muchaina*, indigenous vegetables such as *Ndelele* (Okra) and *madande*. They also have low consumption of fruits such as peaches, grapes, litchis, pineapples, apples, avocados oranges, bananas, mangoes depending on what fruit was in

season. Dairy and dairy products such as milk, yoghurt, sour milk, and some cheese were rarely consumed in the study area. These findings indicate that there was no variety of food eaten in both weekly and 24-hour food recall consumption patterns. The low consumption of dairy and dairy products, fruits and vegetables may lead to deficiencies of some nutrients especially the minerals and vitamins in their diets. According to Brown *et al.* (2013) breakfast is the most important meal of the day because it keeps ones stomach fuller for longer. It also stabilises the stomach chemical compositions. One can concentrate for a longer time without getting tired.

4.9.1 Water to drink in a day

Water makes up about three-quarters of our lean body mass, about 10% of our fat and is one of the most essential nutrients. Drinking enough water every day is good for overall health, for prevention of dehydration and constipation. Although daily fluid intake can come from food and beverages, plain drinking water is one good way of getting fluids as it has zero calories. A large proportion in Matavhela Village (34%) indicated that one should drink eight glasses of water a day so as to clean their body of impurities from the food eaten. In Mbilwi Village some respondents (30%) felt that one must take only 3-4 glasses of water in a day. About 19 percent of the respondents in Mbilwi Village indicated that water was not their favourable drink. They preferred drinking cold drinks and juices. This is contrary to the findings of Kingsolver (2010) who reiterates that water is life and should be taken regularly.

4.9.2 Hunger

Hunger was identified as contributing to eating habits at the study areas. This study revealed that 40 percent of the respondents were affected by hunger in their eating habits. Majority of the respondents indicated that they do not have a fixed timetable for eating. This was revealed by many respondents (48%) who indicated that food is taken whenever they are hungry. A respondent from Matavhela Village highlighted that:

“A human being has to eat when they feel hungry because hunger kills”.

Some eat because they are afraid to develop ulcers. While a large number of respondents said that they can develop dizziness when they are hungry, hence hunger influences them to eat.

4.9.3 Knowledge about type of food

Respondents from the study areas revealed that most of the food they eat was as a result of what they were taught when they were growing up. About 22 percent of the respondents were influenced by the knowledge they got from family, friends and through studying. The findings by USDA (2010) confirm that the knowledge about balanced diet is important for a change of eating habit. This knowledge becomes part of them as it influences their eating habits, food choices and trends. Knowledge about health also contributes to the quality, type and frequency of their eating. One respondents from Mbilwi Village said:

“Health knowledge equips me to follow or know food that is supposed to be consumed. We have been imparted with the knowledge of consuming vegetable, beans and fruits from young age by our parents.”

4.9.4 Taste, smell, desire and influence

Respondents highlighted that they chose certain food because of its taste, smell, and influence. About 20 percent of the respondents eating habits depend on the taste, sweetness, smell, desire, and flavour of food. They asserted that they developed desire to eat food so it influences their eating habits. A respondent from Matavhela Village who said:

“When food smells good, I like to buy and eat it. If food is sweet to taste, I eat. I eat food that smells good and looks attractive which can influence me to buy it. I eat food with good flavour too.”

4.9.5 Culture, tradition, religion and beliefs

A culture is an embodiment of different values with all of them closely related to each other that is, one can meaningfully talk about social, moral, religious, political, aesthetic and even economic values of a culture (Idang, 2015). Culture is passed on from one generation to another and if not well preserved, sometimes tends to lose its value due to modernisation. The study revealed that 19 percent of the respondents from the study areas eating habits

are influenced by their culture, religion and beliefs. Some respondents do not eat modern food stuff like tinned food because they are too traditional. Some also indicated that they grew up eating food that they know, so they do not eat food that is not familiar to them like crayfish, snail, pizza to mention a few.

For some their religion guides them to be selective in their choice of food. The Rastafarians and certain Christian denomination eat only indigenous food because of their religious belief which forbid them from eating other types of foods. Some of them confirmed that they are vegetarian hence, they do not eat meat and pork or drink alcoholic beverages but they eat legumes and plenty of vegetables. Respondents highlighted that such religious and cultural behaviours affect what they eat which agrees with the findings of Idang (2015) who says one cannot separate people's cultural belief from what they eat. One of the respondents from Mbilwi Village indicated that they grew up eating certain foods like porridge, fruits and *tshidzimba* which is cultural food. According to him:

“In my culture, we don't just eat whatever food that comes our way. In our religion, it makes us not to eat everything especially meat. Some food like pork, bacon and mopani worms, I don't consume because my culture does not allow it.”

4.9.6 Adorability

Only a small number of people, about 4 percent, are influenced by the kind of food they come across at the market. They said if it is attractive and adorable, they would buy and eat it especially when they have enough money.

4.9.7 For the purpose of getting energy

Energy gives people the strength to do work. This energy is derived from food, especially from carbohydrates. About 27 percent of respondents from the study area consented that they ate food in order to get energy. Researchers in the food production and food processing industry are busy doing research on special food that gives energy, proteins and vitamins which are vital for development of a healthy person (The Nutrition Source, 2016).

4.9.8 Boredom

There are some respondents that get bored easily due to stress. In order for them to relieve themselves of such stressful conditions, they tend to eat a lot of food. Doctors and physicians see this as a form of disorder. Some of the problems associated with this are the risk of becoming obese or developing sugar related diseases (King et al. (2007); Nguyen & El-Serag, 2010).

4.9.9 Knowledge about type of food

Few respondents (8%) believed that their eating habits are influenced by the knowledge of food they have acquired. For instance, the Rastafarians get knowledge about food they eat through being taught in their religious groups and the Muslims do not eat pork based on their religious beliefs (Dumbrell, 2008). Almost every person know about the benefits of nutrients such as vitamins and others through the education they got from parents, school and even through literature and books they read.

4.9.10 Influenced by taste and desire

Some respondents (12%) from the study areas confirmed that eating habits were influenced by taste, sweetness, smell, aroma and flavour of food they eat. They said the sweet smell of food triggers their salivation especially when they pass by some fast food joints; the aroma from such joints always stimulates them. According to some respondents, the manner in which food is prepared contributes to the way in which they react whether to eat it or not. Food prepared in hygienic and well-presented manner, will always arouse the desire to eat such food.

4.9.11 Culture and religious beliefs from parents

Cultural and religious beliefs handed down by parents were found to be very influential in the choices of food eaten by some respondents. Rastafarians said they do not eat meat but rather vegetables, Muslims do not eat pork rather *halal* food based on religious beliefs while the *Vhavenda* or other ethnic groups have certain animals as their totem hence they do not eat their meat based on cultural beliefs. These findings agree with that of Idang (2015) on

cultural believes of the people. Cultural food like *Tshidzimba* was a favorite delicacy for most people. Some respondents preferred goat meat rather than beef.

4.10 Chapter Summary

The socioeconomic factors and other conditions affect the eating habits of rural people in Mbilwi and Matavhela Villages. Cultural beliefs, knowledge of types of food, religion and taste or aroma from food are some of the factors that affect food choices and eating habits of people in the study area. The results also show that the respondents are willing to adopt new methods in their eating habit in order to have good health.

CHAPTER FIVE: RECOMMENDATIONS AND CONCLUSION

5.1 Introduction

The study assessed food consumption patterns of selected households in Mbilwi and Matavhela villages in Thulamela Municipality, Limpopo province, South Africa. The study respondents constituted residents of various ages, with different academic qualifications and job affiliations. This chapter provides conclusions and recommendations made from the study for nutritional policy development and practice. The main objective of the study was to assess the food consumption patterns of selected households in Mbilwi and Matavhela villages. The specific objectives were to:

- a) Identify the types of food consumed by households in Mbilwi and Matavhela Villages,
- b) Determine whether households in Mbilwi and Matavhela Villages eat nutritionally balanced meals,
- c) Assess nutritional knowledge of households living in Mbilwi and Matavhela Villages,
- d) Examine whether households know the influence or impact on health of the different types of foods and initiate the awareness in the study area on the need and advantages of taking variety of food, and
- e) Analyse socioeconomic factors that influence food consumption patterns among households living in Mbilwi and Matavhela Villages.

5.2 Recommendations from the Study

5.2.1 Recommendations on food consumption

The findings of the study provided an understanding of the food consumptions patterns in the selected villages in Thulamela Municipality. It is therefore, recommended that the Municipality and the households should understand the value of balanced diets and nutritional value in order to reduce malnutrition related illnesses. The results of the study can be used for food related policy development by rural nutritionists and institutions supporting such rural communities. The study can also help in solving the ever increasing challenges of rural poverty (USDA, 2010). This study presented an opportunity that can be grabbed by institutions of higher learning in supporting information sharing with households

and the benefits of quality balanced diets to health and the wellbeing of the society. These findings indicate that there was no variety in food consumption patterns in both the weekly and 24-hour food recalls. Low consumption of milk, fruits and vegetable groups may lead to deficiency of some minerals and vitamins.

Food consumption is associated with how much money households have which is directly to food budget. For example, when finances are limited, families would prefer to eat cheap food such as chicken feet and pap to keep them going - whilst meat could be seen as a luxury due to expenses associated with purchasing such. Culture and beliefs also affect the food consumption behaviour. As highlighted in chapter four, certain foods are condoned by culture and religious beliefs. Mbilwi and Matavhela villages are characterised by mixed traditions and religious orientations viewing the various foods differently. It is therefore, concluded that the type of food, consumption patterns and choices cannot be universally applied. People's choices of food is wholly dependent on their financial capability, religious and cultural orientations.

Although linked to cultural and religious beliefs, households have a knowledge on the influence of food to their health. This was evident when some of the respondents frequently highlighted that certain foods are preferred over the other due to their nutritional value. Such knowledge should be cultivated and shared from one person to the other and also among the villages. The government should assist by establishing nutritional education centres at hospitals and clinics to create awareness.

The importance of vegetables and fruits as impetus for improved and balanced diet in household cannot be overemphasised. The emphasis must be on strengthening backyard vegetable gardens and community food gardening programmes as these will reduce malnutrition even at the national level. There should be improved access to production resources through enabling policies that will ensure access to land and improved tenure support for the community. The community food gardens could form cooperative societies to market their products at the road side or next to their farms. This will be a source of additional income to the households and hence increase food security.

5.2.2 Recommendations on factors affecting food consumption pattern

Majority of the respondents from the study area are dependent on social grants which are too little to meet the food requirement for their households. It is important for the people to

start informal trading activities and food gardening in order to improve their income levels. They could come together and form cooperatives and increase their production and target market. Government is urged to increase their efforts in facilitating such moves by the community.

5.2.2.1 Eating habits/culture/religion

There is an urgent need to address unhealthy dietary patterns in the community (Chin *et al.* 2004). This study in agreement with the previous findings that has shown the need for increased intakes of fruits and vegetables by children at school. (Knai *et al.*, 2006; Bere *et al.*, 2007). Research shows that the most successful interventions are those that are multi-component and increase children's exposure to fruits and vegetables. Thus free distribution schemes, particularly for children of disadvantaged areas or increased selection of fruits and vegetables at school cafeterias or their frequency at school events or activities can provide opportunities for their consumption (Knai *et al.*, 2006). Jiang *et al.*, 2014 report that eating habit is a measure and that there is correlation between food, eating behaviour and emotion, hence everyone should be involved in addressing the problems relating to eating habit of the people.

5.2.2.2 Seasonality of food

It is a common sight to see surplus of certain foods (maize, fruits and vegetables) at different seasons. It is important for policy makers to come up with strategies that will preserve surplus foods especially crops, fruits and vegetables. Agro-processing industries should be given all the necessary incentives and there should be provision for easy establishment of such industries by investors of juice making and agro-packaging companies.

Some foods are seasonal and it would be necessary to learn how to preserve them when they are out of season. One of the most appealing things about growing your own food is that you can go from earth to table in the minimum amount of time, ensuring your fruits and vegetables are at their freshest and most nutritious (Regenerative, 2017). But sometimes your productive plot will produce more harvest than you can eat fresh, this abundance is not simply to be left to wither on the branch or rot on the ground. Vegetable and fruit preservation is not a complicated science hence every household should be trained on how

to preserve their vegetables especially during surplus seasons so as to have the food all year round. Canning involves placing fruit and vegetables in airtight containers, typically glass jars, and so to prevent bacteria getting to them.

One of the oldest methods of preserving food is salting which can be used for meat and fish, as well as sliced vegetables. There are two methods. The first uses a low salt to vegetable ratio (between two and five percent salt per weight of vegetables). It also serves to slightly pickle the vegetables. The second method uses a higher percentage of salt (between twenty and twenty-five percent), preserving the freshness of the produce but adding a salty flavour when used, even after the salt has been washed off. Whichever method of salting you use, you need to store the produce in the refrigerator (Regenerative, 2017). Drying dehydrates the fruit or vegetables, removing all the water along with the bacteria, yeasts and mould that live in the moisture. Besides altering the texture of the food, drying also modifies the taste, typically concentrating it. Dried food has the added benefit of being safe to store as is on your pantry shelf – you don't need special packaging to keep it in or to keep it in the refrigerator (Regenerative, 2017). Freezing fruit and vegetables soon after they are picked serves to 'lock in' the flavour and freshness of the produce. Freezing and thawing vegetable or fruit is the preserving method that will have an end product that most closely resembles the taste of fresh food. You effectively place the food in suspended animation in whatever condition it is in when you freeze it, so always freeze ripe produce, and avoid spoiled specimens. You can freeze the produce in wax-coated cardboard containers, in plastic boxes or jars made with very thick glass (Regenerative, 2017).

5.2.2.3 Lack of time

Most people are genuinely too busy to prepare decent meals hence the only option for such people is to eat out. A lot of money is spent on treatment of diseases as a result of unhealthy eating lifestyles of the people. This also has a negative effect on the economic growth of the country. The policy makers should look into productive working hours which will not impede too much in the social life of its citizen. Education in time management and proper meal planning can assist households to manage the activities associated with access to adequate healthy meals.

5.3 Recommendations on nutritional knowledge of households

Nutritional knowledge is crucial for the wellbeing of a society (Younes, 2014). This will help the households practice healthy behaviours on the food they eat. It will also necessitate the upkeep of children from malnutrition illness. In the study area, households had little knowledge on the value of food they eat. This presented a need to the institutions of higher learning, and the Department of health to support such communities in understanding the value of knowing good food for health reasons. Violence and crimes against women and the vulnerable population can hinder the right to adequate food and nutrition (Bellows *et al.*, 2015). Government has the responsibility to protect the rights of its citizenry. According to Radder & Roux (2005), the food choices made by people are as a result of a long standing lifestyle and sometimes may require expert intervention through counselling and awareness creation to completely break-off from such habits, hence the efforts should be tackled through participatory stakeholder approach.

5.4 Suggestions for Future Research

Understanding the food patterns in the selected rural communities of Thulamela gave a better view of how people behave when it comes to food and nutrition. It can be necessary in the future to create awareness on the health value of quality foods. It can also be relevant for future researchers to look into how the available food resources can be promoted to improve the availability and the quality to households. There are possible options that the households can adopt to improve their consumption patterns and promote consumption of disease fighting foods.

5.5 Conclusion

The assessment of food consumption patterns of selected households of Mbilwi and Matavhela villages found that households usually consume energy giving foods such as carbohydrates and protein in most instances. Although there were instances of variations of consumption, households prioritised energy giving foods. Socio-cultural background affected the choices of what households consume, for example religious and cultural foods that are recommended and condoned were identified. This was attributed to the nature of the prevalent work in the villages selected for the study. It was concluded that financial costs affect the eating habits. Most of the households were unemployed and relied on

government grants and remittances from family members in the metropolitan centres. This study concluded that most of rural household have no adequate access to balanced diets and that households had limited knowledge of alternative food options.

REFERENCES

- African Union, 2006. Towards A Prioritised Outcome-Based Approach To Implementing Africa's Food Security Commitments. "Beyond Diagnosis and Prescription to Action" Summit on Food Security in Africa – Availability, Accessibility and Affordability. Abuja, Nigeria. Retrieved from: http://www.africanunion.org/root/au/Conferences/Past/2006/December/REA/summit/Food_Security.htm. Date accessed: 16/11/2012
- Almerico, G.M. 2014. Food and identity: Food studies, cultural, and personal identity. *Journal of International Business and Cultural Studies*, Volume 8:1-6
- Answers. 2012. Gale Encyclopedia of Food & Culture: Consumption of Food. Retrieved from: <http://www.answers.com/topic/consumption-of-food#ixzz1oc6IIMn1>. Date accessed: 2/3/2012.
- Ballari, S.A. and Barrios-García, M.N. 2014. A review of wild boar *Sus scrofa* diet and factors affecting food selection in native and introduced ranges. *Mammal Review*, 44 (2), 124-134.
- Bargiota, A., Delizona, M., Tsitorus, A. and Koukoulis, G.N. 2013. Eating habits and factors affecting food choice of adolescents living in rural areas. *Hormones*, 12 (2) 246-253.
- Bellows, A.C., Lemke, S., Jenderedjian, A. and Scherbaum, V. 2015. Violence as an Under-Recognized Barrier to Women's Realization of Their Right to Adequate Food and Nutrition: Case Studies from Georgia and South Africa. *Violence against women*, 21(10) 1194-1217.
- Boulos, C., Salameh, P. and Barberger-Gateau, P. 2014. Factors associated with poor nutritional status among community dwelling Lebanese elderly subjects living in rural areas: results of the AMEL study. *The journal of nutrition, health & aging*, 18 (5) 487.
- Brown R. and Ogden, J. 2004. Children's eating attitudes and behaviour: a study of the modelling and control theories of parental influence. *Health Education Research*, Volume 19, Issue 3, 1: 261–271
- Brown, A. 2008. *Understanding food principles and preparation*: third edition Australia: Thompson Wardsworth.

- Brown, A.W., Brown, M.M.B., Allison, D.B. 2013. Belief beyond the evidence: using the proposed effect of breakfast on obesity to show 2 practices that distort scientific evidence. *The American journal of Clinical Nutrition*, Vol. 98 no. 5 1298-1308
- Brown, D., De Wet, G., Holm, L., Norval, J. Simelane, B. and Van Pietzen, M. 2005. *Consumer Studies Grade 10, OBE for FET; NCS Edition*, 40, Pretoria: Department of Education, South Africa
- Chambers, R. 2014. *Rural development: Putting the last first*. USA: Routledge.
- Chen, S.H., Cheng, H.Y., Chuang, Y.H. and Shao, J.H. 2015. Nutritional status and its health-related factors among older adults in rural and urban areas. *Journal of advanced nursing*, 71(1) 42-53.
- Chepape, R.M., Mbatha, K.R. and Luseba, D. 2014. Local use and knowledge validation of fodder trees and shrubs browsed by livestock in Bushbuckridge area, South Africa. *Ghanaian Population* 77, 20.
- Chin, M.H., Cook, S., Drum, M.L., Jin, L., Guillen, M. 2004. Improving Diabetes Care in Midwest Community Health Centers With the Health Disparities Collaborative, *Diabetes Care*; 27(1): 2-8
- CNPP, 2005. *Food Pyramid provided for the public domain*. USA: USDA Center for Nutrition Policy and Promotion
- Community Health Care. 2004. *Ancillary Health Care: Book 2*. Lynwood Ridge: Stimela Publisher.
- Creswell, T.W. 2003. *Research design: second edition*. London: Sage Publications.
- Darmon, N. and 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*, 027.
- Department of Agriculture, 2006. *Strategic Plan for the Department of Agriculture*. Pretoria: The Department of Agriculture, South Africa, 86.
- Donini, L.M., Savina, C. 2003. Eating Habits and Appetite Control in the Elderly: The Anorexia of Aging. *Cambridge University Press*, Volume 15, Issue 1: 73-87
- Dumbrell, S. and Mathai, D. 2008. Getting young men to eat more fruit and vegetables: a qualitative investigation. *Health Promotion Journal of Australia* 19(3) 216 - 221

- Dube, X. 2011. Autumn Health Care; the way forward. *Journal of Move on Health Matters*, 13 April, 2011.
- Fahmida, U., Kolopaking, R., Santika, O., Sriani, S., Umar, J., Htet, M.K. and Ferguson, E. 2015. Effectiveness in improving knowledge, practices, and intakes of “key problem nutrients” of a complementary feeding intervention developed by using linear programming: experience in Lombok, Indonesia. *The American journal of clinical nutrition*, 101 (3) 455-461.
- FAO, 2005: *Diet, Nutrition and the Prevention of Chronic Diseases; Global and regional food consumption patterns and trends*. Spain: Document Repository Produced by: Agriculture and Consumer Protection.
- Food Group Report. 1995. Healthy Eating and Physical Activity: Focus Group Research with Contemplators and Preparers. Nutrition and Physical Activity Communication Team National Center for Chronic Disease Prevention and Health Promotion Centers for Disease Control and Prevention Atlanta, Georgia, USA: CDC
- Furman, E. 2014. The Theory of Compromised Eating Behavior. *Research in Gerontological Nursing*. Volume 7, Issue 2: 78-86
- Gibson, R.S. 2005. Principles of nutritional assessment 2ed. London: Oxford University Press. P.41
- Gillison, F., Stathi, A., Reddy, P., Perry, R., Taylor, G. 2015. Processes of behavior change and weight loss in a theory-based weight loss intervention program: a test of the process model for lifestyle behavior change. *International Journal of Behavioural Nutrition and Physical Activity*. Vol. 12: 2
- Gorski, M.T., Roberto, C.A. 2015. Public health policies to encourage healthy eating habits: recent perspectives. *Dovepress* Volume 7: 81-90
- Higgs, S. 2015. Social norms and their influence on eating behaviours. *Appetite*, 86, 38-44.
- Hirvonen, K., Hoddinott, J., Minten, B. and Stifel, D. 2017. Children’s diets, nutrition knowledge, and access to markets. *World Development*, 95, 303-315.
- Idang, G.E. 2015. African Culture and values. *Phronimon*, Vol.16, No 2.
- IDP Thulamela Municipality. 2014. Integrated Development Plan Review (IDP). Thohoyandou: Thulamela Municipality

- Insel, P.M. and Wardlaw, G.M. 1993. *Perspectives in Nutrition*, Year book. St Louis: Mosby.
- Insel, P.M. and Wardlaw, G.M. 1993. The truth about food and nutrition is both pure and simple. *The Irish Times*, Thursday, January 6, 2011.
- Jemide, J.O., Ene-Obong, H.N., Edet, E.E. and Udoh, E.E. 2016. Association of maternal nutrition knowledge and child feeding practices with nutritional status of children in Calabar South Local Government Area, Cross River State. Nigeria. *Int J Home Science*, 2 (1) 293-298.
- Jiang, Y., King, J.M. and Prinyawiwatkul, W. 2014. A review of measurement and relationships between food, eating behaviour and emotion. *Trends in Food Science & Technology*, 36(1) 15-28.
- Johnston, J.L., Fanzo, J.C., Cogill, B. 2014. Understanding sustainable diets: a descriptive analysis of the determinants and processes that influence diets and their impact on health, food security, and environmental sustainability. *Advances in Nutrition: An International Review Journal*. Jul 1;5 (4):418-29.
- Kant, A.K., Schatzkin, A., Graubard, B., Schairer, C. 2000. A prospective study of diet quality and mortality in women. *Journal of the American Medical Association* 283:2109-2115
- King, N.A., Caudwell, P., Hopkins, M., Byrne, N.M., Colley, R. 2007. Metabolic and Behavioral Compensatory Responses to Exercise Interventions: Barriers to Weight Loss. *Obesity*, Vol. 15, Issue 6: 1373–1383
- Kingsolver, B. 2010. Water is Life. Retrieved from: http://www.standardsinstitutes.org/sites/default/files/material/2_water_is_life_text.pdf. Accessed date: 11/01/2017
- Knai, C.J. Pomerleau, K. Lock and M. McKee. 2006. Getting children to eat more fruit and vegetables: a systematic review, *Preventive Medicine* 42 85-95.
- Kwon, D.Y. 2015. What is ethnic foods. *Journal of Ethnic Foods*, Vol. 2:1
- Labadarios, D. and Steyn, N.P. 2001. South African food-based dietary guidelines - guidelines for whom? *J Clin Nutr*, Vol 14 No 1.
- Latham, M.C. 1997. Human nutrition in the developing world. *FAO Food and Nutrition Series*. No. 29: 447

- Lee, R.D. and Nieman, D.C. 2010. *Nutritional assessment* - 5th ed., International ed.
Dubuque, IA: McGraw-Hill
- Martin-Biggers, J., Spaccarotella, K., Berhaupt-Glickstein, A., Hongu, N., Worobey, J. and Byrd-Bredbenner, C. 2014. Come and get it! A discussion of family mealtime literature and factors affecting obesity risk. *Advances in Nutrition: An International Review Journal*, 5 (3), 235-247.
- Nguyen, D.M, El-Serag, H.B. 2010. The Epidemiology of Obesity. *Gastroenterology Clinics of North America*, Volume 39, Issue 1:1
- Oliver, J. 2016. Food philosophy. Retrieved from: <http://www.jamieoliver.com/philosophy/>.
Date accessed: 11/02/2017
- Philippi S.T., Guerra, P.H. and Leme, A.C.B. 2016. Health behavioral theories used to explain dietary behaviors in adolescents: a systematic review. *Nutrire*, 41:22
- Pollard, J., Kirk, S.L. and Cade, J.E. 2002. Factors affecting food choice in relation to fruit and vegetable intake: a review. *Nutrition research reviews*, 15(02), 373-387.
- Radder, L. and le Roux, R. 2005. *Factors Affecting Food Choice in Relation to Venison: A South African Example*, Port Elizabeth, Publisher Elsevier: Retrieved from: www.elsevier.com/locate/meatsc. Date accessed: 12/02/2015
- Reville, W. 2011. Diet, Nutrition and the Prevention of Chronic Diseases. Retrieved from: <http://www.irishtimes.com/newspaper/sciencetoday/2011/0106/1224286856651.html>.
Date accessed: 2012/05/10
- Rolfes, R.S. and Whitney, E.N. 1999. *Understanding Nutrition*: 8th edition, USA: Wadsworth Publishing Company
- Sanjur, D. 1982. *Social and cultural Perspective in Nutrition*. USA: Prentice-Hall.
- Seligman, H.K., Schillinger, D. 2010. Hunger and Socioeconomic Disparities in Chronic Disease. *The New England Journal of Medicine* 3, 63.1: 6-9.
- Sharma, M., Wagner, D.I. 2004. Predicting Childhood Obesity Prevention Behaviors Using Social Cognitive Theory 2004. *International Quarterly of Community Health Education*, Vol 24, Issue 3
- Sizer, F. and Whitney, E. 2006. *Nutrition concepts and controversies* (10th Ed.), Australia/Canada: Thompson Wadsworth, Library of Congress.

- Sizer, F. and Whitney, E.. 2006. *Nutrition and Concepts and Controversies* (8thEd.). Australia/Canada: Thompson Wadsworth, Library of Congress.
- The Nutrition Source. 2016. Proteins. Harvard TH Chan. USA: School of Public Health. Retrieved from: <https://www.hsph.harvard.edu/nutritionsource/what-should-you-eat/protein/> Accessed date: 11/5/2017
- Turrell, G. and Kavanagh, A. 2007. Socio-economic pathways to diet: modelling the association between socio-economic position and food purchasing behaviour. *Public Health Nutrition* Vol. 9, Issue 3
- USDA, 2010. Rural Income, Poverty, and Welfare: Summary of Conditions and Trends (NUTRITION- ERS-USDA Briefing Room - Rural Income, Poverty, and Welfare Summary of Conditions and Trends.htm). Retrieved from: www.webadmin@ers.usda.gov. Date accessed: October 6, 2011.
- Van der Merwe, D., Bosman, M. and Ellis, S. 2014. Consumers' opinions and use of food labels: Results from an urban– rural hybrid area in South Africa. *Food Research International*, 63, 100-107.
- Walsh, C.M. and Van Rooyen, F.C. 2015. Household food security and hunger in rural and urban communities in the Free State Province, South Africa. *Ecology of food and nutrition*, 54 (2), 118-137.
- Wang, D., Shi, Y., Chang, C., Stewart, D., Ji, Y., Wang, Y. and Harris, N. 2014. Knowledge, attitudes and behaviour regarding nutrition and dietary intake of seventh-grade students in rural areas of Mi Yun County, Beijing, China. *Environmental health and preventive medicine*, 19(3), 179-186.
- Wardlaw, G.M. 1999. *Perspectives in Nutrition*, Fourth Edition. Colin H. Wheatley, Library of Congress Cataloging in-Publishing Data. USA: McGraw-hill Companies, Inc.
- Wardlaw, G.M., Insel, P.M., Seyler, M.F. 1994. *Contemporary Nutrition: Issues and Insights* (2nd Edition). USA: Library of Congress Cataloging in Publication Data, Chicago.
- Waterfront Media, INC. 2008. Nutrition food facts, balanced diet and diet chart. Retrieved from: [www.http\\Waterfront Media_INC/Nutrition_Facts_Balanced_Diet_and_Health_Diet_Chart-Weight_Loss_Programs.htm](http://www.WaterfrontMedia_INC/Nutrition_Facts_Balanced_Diet_and_Health_Diet_Chart-Weight_Loss_Programs.htm). Date accessed: 2011/02/28.

- Weather Bureau. 1986. *Climate of South Africa: Climate statistics up to 1994*. Pretoria: Department of Environmental Affairs.
- Whitney, E.N. and Rolfer, S.R. 1999. *Understanding nutrition*, (8th Ed.). Printed in the United States of America: Wardsworth Publishing Company.
- Whitney, E.N. and Rolfes, S.R. 2008. *Understanding nutrition*, (11th Ed.). Australia: Thomson Learning INC. Publisher Library of Congress.
- Younes, L., Houweling, T.A., Azad, K., Kuddus, A., Shaha, S., Haq, B., Nahar, T., Hossen, M., Beard, J., Copas, A. and Prost, A. 2014. The effect of participatory women's groups on infant feeding and child health knowledge, behaviour and outcomes in rural Bangladesh: A controlled before-and-after study. *J Epidemiol Community Health*, 2014.

APPENDICES

Appendix 1: Questionnaire

ASSESSMENT OF FOOD CONSUMPTION PATTERNS OF SELECTED HOUSEHOLDS OF MBILWI AND MATAVHELA VILLAGES IN THULAMELA & MUTALE MUNICIPALITIES RESPECTIVELY IN LIMPOPO PROVINCE OF SOUTH AFRICA.

DEMOGRAPHIC INFORMATION

DATE:.....

Surname and Initials (optional)

.....

1. Gender

1.	Male	
2.	Female	

2. Contact Details (optional)

--

3. Age

4. Marital Status.....

5. Highest grade passed.....

6. Post/ high school Education.....

4.	Other (specify)	
----	-----------------	--

7. What is your occupation (Explain)

1.	Nurse	
2.	Teacher	
3.	Police Officer	
4.	Self-employed	
5.	Unemployed	
6.	Other (Specify)	

8. What is your main source of income?

1.	Own Salary	
2.	Pension Grant	
3.	Child grant	
4.	Spouse	
5.	Other (Specify)	

9. Total Monthly Household income

1.	R 500-900	
2.	R 1200-2400	
3.	R 2100-2500	
4.	R 2600-3500	
5.	Other (Specify)	

10. How many people live in the household including yourself?

1.	1-3	
2.	4-6	
3.	7-9	
4.	10-12	

10. Do you live in your own house or rental?

1.	OWN	
2.	RENTAL	

11. How often do you eat the following foods.

	Food List	Frequency/week		
--	-----------	----------------	--	--

11.1	Cereals	1	2	3	4	5	6	7	Othe r
i.	Maize porridge								
ii.	Samp and beans								
iii.	Samp								
iv.	Boiled potatoes								
v.	Bread								
vi.	Cornflakes								
vii.	Jungle Oats								
viii.	Oat meal								
ix.	Potatoes								
x.	Rice								
xi.	Sorghum pap								
xii.	Sweet potatoes								
xiii.	Tshidzimba								
	Other(specify)								
	Other(specify)								
	Other(specify)								
	Other(specify)								
	Other(specify)								
	Other(specify)								
	Other(specify)								
	Other(specify)								
	Other(specify)								
	Other(specify)								
	Other(specify)								
	Other(specify)								
11.2	Vegetables	1	2	3	4	5	6	7	Othe r
i.	Blackjack								
ii.	Broccoli								
iii.	Butternut								
iv.	Cabbage								
v.	Carrots								
vi.	Cassava								
vii.	Cocoyam								

viii.	Cauliflower									
ix.	China cabbage									
x.	Cucumber									
xi.	Beetroot									
Xii	Green/red pepper									
Xiii	Delele									
Xiv	Green beans									
Xv	Ground nuts									
Xvi	Lettuce									
Xvii	Muchina									
Xviii	Mukusule									
Xiv	Pumpkin									
Xx	Pumpkin leaves									
Xxi	Spinach									
Xxii	Tomatoes									
Xxiii	Vowa									
Xxiii	Blackjack leaves									
Xxiv	Bean leaves									
Xxv	Muxe									
Xxvi	Sweet potato leaves									
	Other(specify)									
	Other(specify)									
	Other(specify)									
	Other(specify)									
	Other(specify)									
	Other(specify)									
	Other(specify)									
	Other(specify)									
	Other(specify)									
	Other(specify)									
	Other(specify)									
	Other(specify)									
11.3	Milk and milk products	1	2	3	4	5	6	7	Othe	r
i.	Amasi									

ii.	Butter								
iii.	Canned milk								
iv.	Cheese								
v.	Chocolate								
vi.	Condensed milk								
vii.	Cows milk								
viii.	Custard								
ix.	Fresh milk								
x.	Ice-Cream								
xi.	Skimmed Milk								
xii.	Sour Milk								
xiii.	Yoghurt								
xiv.	Others(specify)								

	Others(specify)								
	Others(specify)								
	Others(specify)								
	Others(specify)								
	Others(specify)								
	Others(specify)								
	Others(specify)								
	Others(specify)								
11. 4	Meat and Legumes	1	2	3	4	5	6	7	Othe r
i.	Bacon								
ii.	Beef								
iii.	Offals								
iv.	Liver								
v.	Kidney								
vi.	Heart								
vii.	Chicken								
viii.	Chicken Head and feet								
ix.	Chicken heart								
x.	Chicken intestines								
xi.	Fish								
xii.	Mutton								
xiii.	Polony								
xiv.	Pork								
xv.	Russian sausages								
xvi.	Turkey								
xvii.	Flying ants								
xviii.	Grasshoppers								
xix.	Duck								
xx.	Beans								
xxi.	Cowpeas								
xxii.	Lentils								

xxiii.	Ground beans								
xxiv.	Ground nut								
xxv.	Soya mince								
xxvi.	Peanuts and butter								
xxvii.	Game meat								
	Others(specify)								
	Others(specify)								
	Others(specify)								
	Others(specify)								
	Others(specify)								
	Others(specify)								
11.	Fruits	1	2	3	4	5	6	7	Othe
5									r
i.	Banana								
ii.	Guava								
iii.	Mango								
iv.	Orange								
v.	Pawpaw								
vi.	Pineapple								
vii.	Ovacado								
viii.	Peach								
ix.	Litchis								
x.	Watermelon								
xi.	Grapes								
xii.	Kiwi								
xiii.	Lemon								
xiv.	Grapes								
xv.	Strawberries								
xvi.	Mavhungu								

xvii.	Pfuka								
xviii.	Tsuma								
xix.	Mavhungo								
xx.	Mahuhuma								
xxi.	Nectarin								
xxii.	Guavas								
xxiii.	Prikle pears								
xxiv.	Appricot								
xxv.	Plum								
	Others(Specify)								
	Others(Specify)								
	Others(Specify)								
	Others(Specify)								
	Others(Specify)								
	Others(Specify)								
	Others(Specify)								
	Others(Specify)								
	Others(Specify)								

12. 24-hour food recall

12.1 List the food you ate yesterday from the time you woke up to the time you went to bed or sleep.

	Food item	Amount/estimation
1		
2		
3		
4		
5		
6		
7		

8		
9		
10		
11		
12		
13		
14		
15		
16		
17		

13. Is this how you normally eat? (Yes / No)

.....

13.1 If No, please explain.

.....

14. SOCIO-ECONOMIC FACTORS THAT INFLUENCE FOOD CHOICE/EATING HABIT.

14.1 What are the factors which influence your eating habit? (list them and explain).
 probe one factor at a time.

.....

.....

.....

.....

.....

.....

15. Do you sometimes skip meal or reduce the size of meal because of other reasons?
Explain

.....

.....

16. What is the most important meal of the day?

16.1 Break fast	
16.2 Lunch	
16.3 Supper	

SECTION B

Nutritional knowledge

17. What will be a healthy breakfast?

.....

.....

.....

.....

.....

.....

.....

20. How much water must you drink per day?

1.	1-2 glasses (235-470ml)	
2.	3-4 glasses	

3.	5-6 glasses	
4.	7-8 glasses	

21. Which foods are the key to good health?

.....
.....
.....
.....

22. Which foods are bad for your health?

23. What should be in a balanced diet?

.....
.....
.....
.....
.....

24. Which measure of balanced diet must be contained in a portion of meal?

.....
.....
.....
.....

25. Mention diseases related to food sources/items that we eat?

.....
.....
.....
.....
.....

26. Over cooking vegetables affect their nutrients content(Yes/No)

.....

26. List healthy snacks and give reasons

	Snacks	Reasons
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		

27. Do you get the information on the nutritional food, If so where do you usually get the information?

.....

28. A lot of sugar is good for your health? (Yes/No)

.....

29. A lot of salt is not good for your health? (Yes/No)

.....

Appendix 2: Consent Letter

Letter Accompanying the Questionnaires used to collect data

P.O. BOX 2886

SIBASA

0970

MATAVHELA HEADMAN

MATAVHELA VILLAGE

TSHILAMBA

0950

THE COMMUNITY / RESPONDENT

Dear sir / Madam

Re: Request to participate in conducting a Research

I'm a post graduate student at the University of Venda pursuing a Master's degree in Rural development under the institute for Rural development. The focus of my study (topic) is an assessment of food consumption patterns of selected households of Mbilwi and Matavhela Municipalities respectively in Limpopo province of South Africa.

Your village (area) has been sampled for the study and community have also been selected as a respondent. The information gathered will be treated as strictly confidential and under no circumstance will it be used for any other reason than academic purposes.

I hope my request will be taken into account.

Yours Faithfully

Magadze A. A (MS)

CONTACT: 0722886318

Supervisor Name

Mbhatsani H.V

CONTACTS: 015 9625 8685

Appendix 3: Ethical Clearance Certificate

**RESEARCH AND INNOVATION
OFFICE OF THE DIRECTOR**

**NAME OF RESEARCHER/INVESTIGATOR:
Ms A Magadze**

**Student No:
11523674**

**PROJECT TITLE: An assessment of food
consumption patterns of selected households of
Mbilwi and Matavhela Villages in Thulamela
Municipality, Limpopo Province of South Africa.**

PROJECT NO: SARDF/16/IRD/03/1907

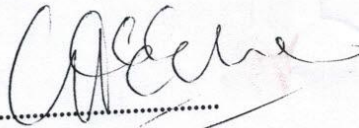
SUPERVISORS/ CO-RESEARCHERS/ CO-INVESTIGATORS

NAME	INSTITUTION & DEPARTMENT	ROLE
Prof LL Maliwichi	University of Venda	Supervisor
Prof A Musyoki	University of Venda	Co-Supervisor
Ms HV Mbhatsani	University of Venda	Co-Supervisor
Ms A Magadze	University of Venda	Investigator - Student

**ISSUED BY:
UNIVERSITY OF VENDA, RESEARCH ETHICS COMMITTEE**

Date Considered: July 2016

Decision by Ethical Clearance Committee Granted

Signature of Chairperson of the Committee: 

Name of the Chairperson of the Committee: Prof. G.E. Ekosse

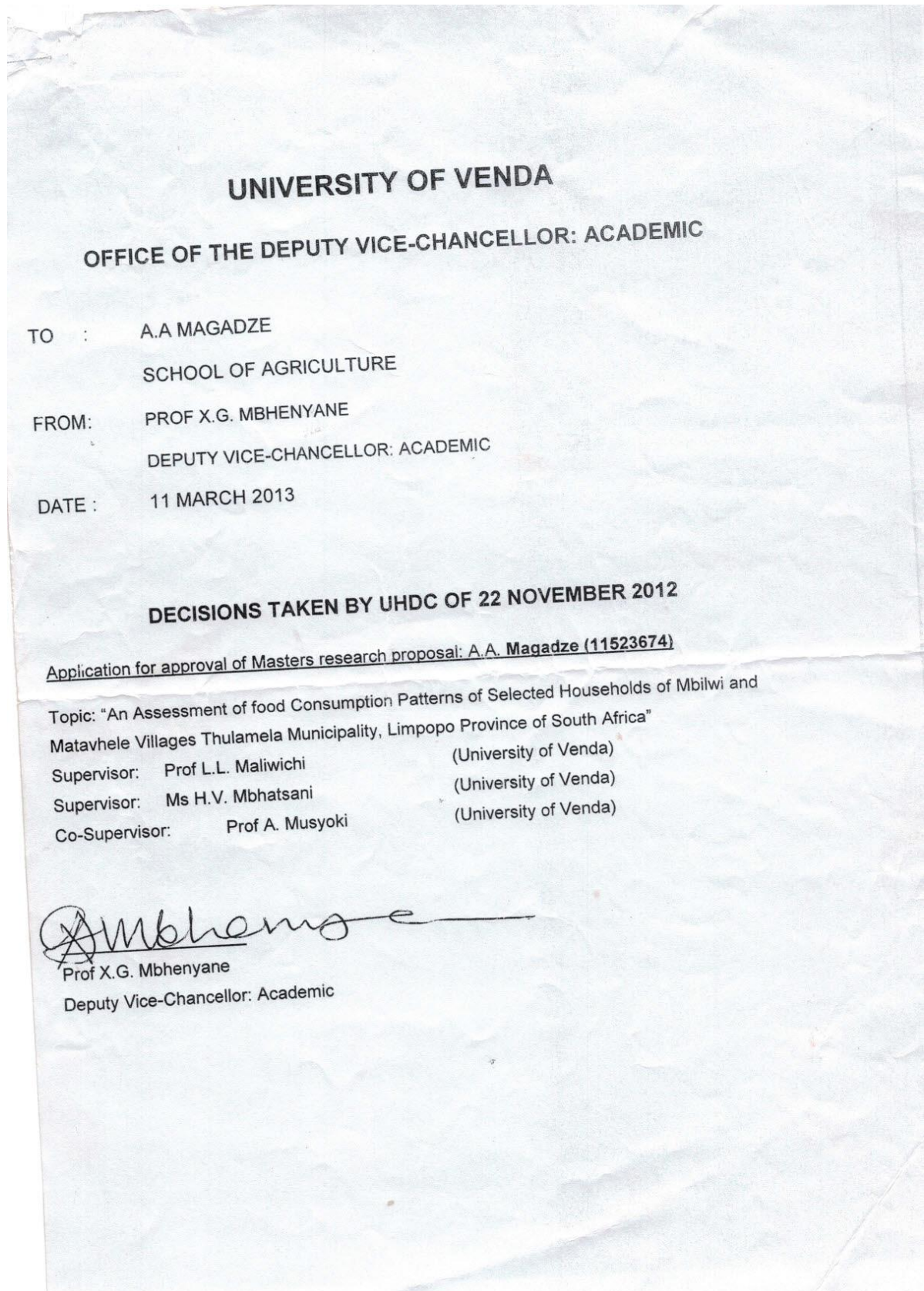
UNIVERSITY OF VENDA DIRECTOR RESEARCH AND INNOVATION 2016 -07- 2 0
Private Bag X5050 Thohoyandou 0950



University of Venda
PRIVATE BAG X5050, THOHOYANDOU, 0950, LIMPOPO PROVINCE, SOUTH AFRICA
TELEPHONE (015) 962 8504/8313 FAX (015) 962 9060

"A quality driven financially sustainable, rural-based Comprehensive University"

Appendix 4: UHDC Approval



Appendix 5: Letter for Permission to conduct Research in the Community

Letter Accompanying the Questionnaires used to collect data

P.O. BOX 2886

SIBASA

0970

MATAVHELA HEADMAN

MATAVHELA VILLAGE

TSHILAMBA

0950

THE COMMUNITY / RESPONDENT

Dear sir / Madam

Re: Request to participate in conducting a Research

I'm a post graduate student at the University of Venda pursuing a Master's degree in Rural development under the institute for Rural development. The focus of my study (topic) is an assessment of food consumption patterns of selected households of Mbilwi and Matavhela Municipalities respectively in Limpopo province of South Africa.

Your village (area) has been sampled for the study and community have also been selected as a respondent. The information gathered will be treated as strictly confidential and under no circumstance will it be used for any other reason than academic purposes.

I hope my request will be taken into account.

Yours Faithfully

Magadze A. A (MS)


CONTACT: 0722886318

Supervisor Name

Mbhatsani H.V

CONTACTS: 015 9625 8685

Appendix 6: Letter of Permission by Vhembe District Government

**LIMPOPO**
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF
EDUCATION
VHEMBE DISTRICT

REF: 14/7/R
ENG: MATIBE M.S
TEL: 015 962 1029

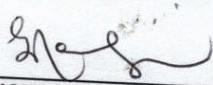
CONFIDENTIAL

MRS AGNES MAGADZE
UNIVERSITY OF VENDA
PRIVATE BAG X5050
THOHOYANDOU
0950

DEPARTMENT OF EDUCATION
VHEMBE DISTRICT
2016 -11- 09
PRIVATE BAG X 2250 SIBASA 0970
TEL: 015 962 1313/4 FAX: 015 962 6039
LIMPOPO PROVINCE

REQUEST FOR PERMISSION TO CONDUCT RESEARCH AT VHEMBE DISTRICT.

1. The above matter refers.
2. You are hereby informed that your request for permission to conduct research titled, **"ASSESSMENT OF FOOD CONSUMPTION PATTERNS OF SELECTED HOUSEHOLD OF MBILWI AND MATAVHELA VILLAGES IN THULAMELA AND MUTALE MUNICIPALITIES RESPECTIVELY IN LIMPOPO PROVINCE OF SOUTH AFRICA,** has been granted.
3. You are expected to adhere to research ethical considerations, particularly those relating to confidentiality, anonymity and informed consent of your research subjects
4. Kindly inform Circuit Managers and Principals of selected schools prior to commencing your data collection.
5. Ensure that your research activities do not disturb teaching and learning in the schools.
6. Wishing you the best in your study.


DISTRICT DIRECTOR

09/11/2016
DATE

REQUEST FOR PERMISSION TO CONDUCT RESEARCH AT VHEMBE DISTRICT.[Type text] Page 1

Thohoyandou Government Building, Old Parliament, Block D, Private Bag X2250, SIBASA, 0970
Tel: (015) 962 1313 or (015) 962 1331, Fax: (015) 962 6039 or (015) 962 2288

The heartland of southern Africa - development is about people!

Appendix 7: Letter of Request to conduct Research

University of Venda

Thohoyandou, 0950

South Africa

20 July 2016

Dear sir /Madam

Request for permission to conduct a research

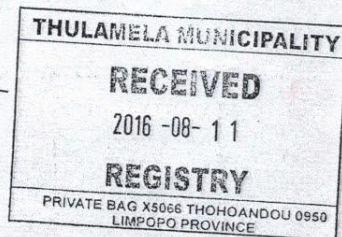
This letter serves to request for permission to conduct study entitled: **ASSESSMENT OF FOOD CONSUMPTION PATTERNS OF SELECTED HOUSEHOLDS OF MBILWI AND MATAVHELA VILLAGES IN THULAMELA & MUTALE MUNICIPALITIES RESPECTIVELY IN LIMPOPO PROVINCE OF SOUTH AFRICA.**

I hereby formally request permission to carry out the above study in Vhembe District area particularly in Thulamela and Mutale Municipalities for the Master's Degree in Rural Development in the school of Agriculture at University of Venda.

The purpose of the study is to do Assessment of food consumption patterns of selected households of Mbilwi and Matavhela villages in Thulamela & Mutale municipalities respectively in Limpopo province of South Aafrica. This study is quite significant because the findings will not use for academic qualification but can also be used to develop interventions to improve or food consumption patterns of selected households of Mbilwi and Matavhela villages.

Kindest regards

Mrs Agnes ~~Madzage~~ ^{Magadze}



Appendix 8: Language Editing Proof of the Proposal

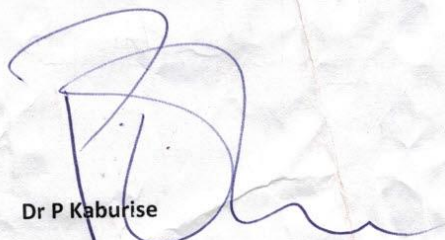


University of Venda

03 October, 2012

TO WHOM IT MAY CONCERN

This is to certify that I, **Dr P Kaburise**, of the English Department, University of Venda have proof read the document – **AN ASSESSMENT OF FOOD CONSUMPTION PATTERNS OF SELECTED HOUSEHOLDS OF MBILWI AND MATAVHELA VILLAGES IN THULAMELA MUNICIPALITY, LIMPOPO PROVINCE OF SOUTH AFRICA** – by **Agnes Azwihangwisi Magadze**. I have recommended some amendments which the student has undertaken to effect before the document is submitted.



Dr P Kaburise
(0736461986 /0794927451)