

**ASSESSING THE ACCESS TO NUTRITIOUS FOOD BY HOUSEHOLDS
PARTICIPATING IN THE HOUSEHOLD FOOD SECURITY SHORT LEARNING
PROGRAMME**

by

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DECLARATION

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ASSESSING THE ACCESS TO NUTRITIOUS FOOD BY HOUSEHOLDS
PARTICIPATING IN THE HOUSEHOLD FOOD SECURITY SHORT LEARNING
PROGRAMME IN DYSSELSDORP, WESTERN CAPE.

I declare that the above dissertation is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

Signature

Date

UNIVERSITY OF SOUTH AFRICA

DEDICATION

This dissertation is dedicated to my late mother and my family who supported, encouraged and motivated me when I was doing my study.

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ABSTRACT

South Africa ranks high among the developing countries with income inequality and household food insecurity is a major concern in the country. The overall objective of the study was to investigate access and practices, which lead to increasing household access to nutritious food by households. The students registered for the one-year course identified households in the Dysseisdorp settlement in the Western Cape, South Africa which they worked closely with in food gardening.

Descriptive research methods were used to assess food access and identify the socio-economic and demographic variables for this study. Qualitative and quantitative methods were used to gather data, following the College of Agriculture and Environmental Sciences of the University of South Africa's ethical protocol and guidelines. Data were collected in the middle and at the end of the coursework (mid-term and end-term). A semi-structured baseline questionnaire was used to interview households and to conduct focus group discussions with the students. The baseline questionnaire consisted of five sections, namely the socio-demographic information, food utilization, food availability, food accessibility and the living standards measurement scores. A stratified random sampling strategy was used to select 30 students to participate in the focus group discussions. The students identified three or four households, which they worked closely with and those households were purposively selected for the baseline interviews.

Data were analyzed using the Statistical Package for Social Sciences programme (IBM SPSS 24). Descriptive statistics (mean, frequencies and standard deviation) were used to compare the data. The 24-hour recall and 7 days food frequency recall was used to assess the household food consumption patterns. Qualitative data were recorded, transcribed, then themes and connections were used to explain the data and correlated with the objectives of the study.

The socio-demographic data showed that most of the respondents were above 50 years old and they had an average number of 5.2 members. Thirty-one percent (31%) of the household heads had reached grade 8 to 12 in school, while 69% were those who had not gone to school and completed up to grade 7. Majority of the households relied on social grants as a source of income. The amount of money spent on food by the households in a month was between 0-R500 (63%) and 37% spent above R500 on food. Women participated more in food-related activities than men and the gardening activities were shared by the members of the households.

The HDDS is a qualitative method for food consumption, which reflects household access to a variety of foods. The HDDS consists of food groups that the household has consumed over the past 24-hours and it is calculated based on the 12 food groups from the food consumed which are summed up; the mean score is used to determine diet diversity (Swindale & Bilinsky, 2006). The findings in this study is that the average HDDS increased from 5.6 to 6.4, which is above the recommended cut-off point for dietary quality (Steyn *et al.*, 2006).

Both the 24-hour recall and 7 days food frequency reported a high consumption of carbohydrates and meat, and less consumption of other food groups such as milk,

eggs, fruits and vegetables were noted. The households relied on a variety of coping strategies such as asking for food from family or neighbours, depending on charity/grants, finding other sources of food and collecting wild food. All the households grew their own fruits, vegetables and crops. However, livestock production was practiced by 10% of the participating households. The households used preservation methods such as keeping food in a dry place (26), sun drying (38), canning (6), freezing (53) and refrigeration (11) to keep and store vegetables.

The Living Standard Measurement (LSM) is a tool which focuses on household access to services and facilities (Faber *et al.*, 2017). Household characteristics range from level 1 up to level 10, and a score from 1 to 4 are considered to be poor and lack access to services, while scores above 5 have improved access to resources and services. The LSM results of the households indicates that they have improved access to services as all the households scored above five.

All the households, had access to land with water, electricity and toilet facilities in the yard. The major constraints experienced by the households were insufficient water, theft, pests, plant diseases and livestock which destroyed the crops. It is recommended that the government provide programmes aimed at developing communities, promoting healthy eating and food production. Workshops on nutrition education should be continuous and focus on basic sanitation, food hygiene. Income generation small-scale businesses, crop production, and livestock rearing will assist in alleviating hunger and unemployment. These initiatives could be extended to other areas of the country as a way to improve food security.

Keywords: Food access, Food consumption patterns, Food insecurity, Home gardens, Household dietary diversity.

LIST OF ABBREVIATIONS

CBOs	Community Based Organizations
CS	Community Survey
CWP	Community Work Programme
DDS	Dietary Diversity Score
FANTA	Food and Nutrition Technical Assistance
FAO	Food and Agriculture Organization
FBDGs	Food Based Dietary Guidelines
FSC	Food Supply Chain
GHS	General Household Survey
HDDS	Household Dietary Diversity Scores
HIV	Human Immunodeficiency Virus
HKI	Helen Keller International
HFS	Household Food Security
IDDS	Individual Dietary Diversity Score
IFSS	Integrated Security Strategy
IFAD	International Fund for Agricultural Development
LSM	Living Standard Measurement
MDGs	Millennium Development Goals
NGOs	Non-Governmental Organizations
NSNP	National School Nutrition Programme
PHFS	Programme in Household Food Security
SA	South Africa
SAARF	South African Audience Research Forum
SAFBDGs	South African Food Based Dietary Guidelines
SAIDE	South African Institute for Distance Education

SANHANES	South African National Health and Nutrition Examination Survey
SLP	Short Learning Programme
Stats SA	Statistics South Africa
UN	United Nations
UNISA	University of South Africa
WFP	World Food Programme
WHO	World Health Organization

TABLE OF CONTENTS

DECLARATION.....	II
DEDICATION.....	III
ACKNOWLEDGEMENTS	IV
LIST OF ABBREVIATIONS	VIII
LIST OF TABLES.....	XIII
LIST OF FIGURES.....	XIV
CHAPTER 1: INTRODUCTION	1
1.1 BACKGROUND OF THE STUDY	1
1.2 PROBLEM STATEMENT.....	5
1.3 PURPOSE OF THE RESEARCH	8
1.3.1 <i>Aim of the study</i>	8
1.3.2 <i>Objectives of the study</i>	8
1.4 LAYOUT OF THE DISSERTATION.....	8
CHAPTER 2: LITERATURE REVIEW	10
2.1 INTRODUCTION.....	10
2.2 DEFINITION OF FOOD SECURITY.....	10
2.2.1 <i>Food availability</i>	11
2.2.2 <i>Food accessibility</i>	12
2.2.3 <i>Food utilization</i>	13
2.2.4 <i>Food stability</i>	14
2.3 MEASUREMENT OF FOOD SECURITY AT THE HOUSEHOLD LEVEL.....	14
2.4 CAUSES OF FOOD INSECURITY	16
2.4.1 <i>Population growth and urbanisation</i>	17
2.4.2 <i>Poverty</i>	18
2.4.3 <i>Health conditions</i>	19
2.4.4 <i>Other factors related to food insecurity</i>	19
2.5 THE CONSEQUENCES OF FOOD INSECURITY	20
2.6 FOOD SECURITY IN SOUTH AFRICA.....	21
2.7 FOOD SECURITY AT A HOUSEHOLD LEVEL	24
2.8 HOUSEHOLD FOOD SECURITY, FOOD ACCESS AND FOOD GARDENING	25
2.9 HOME GARDENS ROLE IN ACHIEVING HOUSEHOLD FOOD SECURITY	26
2.10 TRAINING INTERVENTIONS FOR IMPROVING FOOD SECURITY	30
2.11 HOUSEHOLD FOOD SECURITY SHORT LEARNING PROGRAMME'S OBJECTIVES.....	32
2.12 SUMMARY.....	34
CHAPTER 3: METHODS AND MATERIALS	35
3.1 INTRODUCTION.....	35

3.2	POPULATION AND STUDY AREA.....	35
3.3	STUDY DESIGN.....	37
3.4	SAMPLING.....	38
3.5	DATA COLLECTION.....	39
3.5.1	<i>The household food security baseline questionnaire</i>	40
3.5.2	<i>Focus group discussions</i>	41
3.5.3	<i>24-Hour food recall, Household Diet Diversity Scores and Food Frequency recall</i>	41
3.5.4	<i>Field visit: pilot study</i>	43
3.5.5	<i>The Mid-term interviews</i>	43
3.5.6	<i>The End-term interviews</i>	44
3.6	DATA ANALYSIS.....	44
3.7	SIGNIFICANCE OF THE STUDY.....	45
3.8	ETHICAL CONSIDERATIONS.....	46
CHAPTER 4: RESULTS AND DISCUSSION.....		47
4.1	INTRODUCTION.....	47
4.2	SOCIO-DEMOGRAPHIC DATA.....	48
4.2.1	<i>The age distribution of respondents</i>	48
4.2.2	<i>Distribution of household size</i>	50
4.3	HOUSEHOLD ACTIVITIES.....	55
4.3.1.	<i>Food preparation</i>	55
4.3.2.	<i>Food purchasing</i>	55
4.3.3.	<i>Home gardening activities</i>	56
4.4	FOOD GROUPS AND DIETARY DIVERSITY.....	57
4.4.1	<i>Food groups consumed in 24-hours</i>	58
4.4.2	<i>Household Dietary Diversity Score from the 24-hours recall</i>	59
4.4.3	<i>Food consumed in the past 7 days (one week)</i>	60
4.4.4	<i>Food distribution in the household</i>	66
4.4.5	<i>Food consumption coping strategies used in times of food shortages</i>	68
4.5	AGRICULTURAL PRODUCTION IN THE HOME GARDEN.....	69
4.5.1	<i>Vegetables produced in the household garden</i>	70
4.5.2	<i>Traditional, wild plants and herbs produced in the home garden</i>	71
4.5.3	<i>Crops and herb plants produced in the home garden</i>	72
4.5.4	<i>Fruit plants produced in the home garden</i>	73
4.5.5	<i>Livestock production in the household</i>	74
4.6	HOUSEHOLD ACCESS TO WATER AND SANITATION SERVICES.....	75
4.6.1.	<i>Water access by the households</i>	75
4.6.2.	<i>The type of toilet facilities accessed and used by households</i>	76
4.7	HOUSEHOLD FOOD ACCESS.....	77
4.7.1	<i>Reasons for producing food in the home garden</i>	77
4.7.2	<i>Determination of how long food lasts in the household</i>	78
4.7.3	<i>Households access to Fruit and Vegetables</i>	79
4.7.4	<i>Access to transport</i>	80
4.7.5	<i>Food preservation practices</i>	80
4.8	SOURCE OF INCOME.....	81
4.9	THE LIVING STANDARD MEASUREMENT SCORES.....	85
4.10	HOME GARDEN TYPE AND CROPS AVAILABLE.....	87
4.11	WHAT HAS THE PROGRAMME IMPROVED IN YOUR LIFE OR HOUSEHOLDS?.....	89

4.12	CHALLENGES FACED BY THE HOUSEHOLDS AND STUDENTS.....	89
CHAPTER 5: CONCLUSION AND RECOMMENDATIONS.....		91
5.1	INTRODUCTION.....	91
5.2	SUMMARY OF THE MAIN FINDINGS.....	91
5.2.1.	<i>Demographic data</i>	91
5.2.2.	<i>Household coping strategies</i>	92
5.2.3.	<i>Food consumption patterns</i>	92
5.2.4.	<i>Household income and expenditure on food items</i>	95
5.2.5.	<i>Household gardening</i>	96
5.3	LIMITATIONS.....	96
5.4	RECOMMENDATIONS.....	97
5.4.1	<i>Recommendations for households to improve diet diversity</i>	97
5.4.2	<i>Recommendations on nutrition education</i>	98
5.4.3	<i>Recommendations on job creation opportunities</i>	99
5.4.4	<i>Recommendations on household gardening or farming</i>	100
5.4.5	<i>Recommendation to the challenges faced by the households and students</i>	101
5.4.6	<i>Recommendations for further research</i>	104
5.5	CONCLUSION.....	104
REFERENCES.....		106
APPENDIX A: BASELINE QUESTIONNAIRE.....		126
APPENDIX B: FOCUS GROUP DISCUSSION OUTLINE.....		142
APPENDIX C: CONSENT FORM.....		143

LIST OF TABLES

	Page
Table 1.1. Food security indicators	3
Table 3.1. Details of instruments used for data collection to achieve tabulated objectives	40
Table 3.2. Aggregation of food groups to create HDDS.....	42
Table 4.1. Frequency distribution and average household size of the 100 households in Dysselsdorp.....	51
Table 4.2. Percentage of the HDDS ranges of respondent households.....	59
Table 4.3. Consumption patterns of different food items from the 7-day dietary recall	61

LIST OF FIGURES

	Page
Figure 3.1. Map of South Africa (Western Cape Province highlighted).....	36
Figure 3.2. Map of the Western Cape Province (Oudtshoorn highlighted)	37
Figure 4.1. The age distribution of respondents.....	49
Figure 4.2. The highest level of education of the household head	51
Figure 4.3. Distribution of years residing in Settlement.....	53
Figure 4.4. Distribution of the household members responsible for preparing food.	55
Figure 4.5. The distribution of household members responsible for buying food.....	56
Figure 4.6. Distribution of household members working in the garden.....	56
Figure 4.7. The summary of the reported 12 food groups consumed by the participating households in 24 hours.	58
Figure 4.8. Distribution of who eat first in the household.....	66
Figure 4.9. The frequency hunger scale	67
Figure 4.10. The frequency of utilization of the food consumption coping strategies...	69
Figure 4.11. Frequencies of vegetables produced in the garden.	71
Figure 4.12. Traditional, wild & herbs produced in the household gardens.....	72

Figure 4.13. The distribution of crops & herbs produced in the household garden.....	73
Figure 4.14. The distribution of fruits produced in the household garden.....	74
Figure 4.15. The distribution of livestock produced by the households.....	74
Figure 4.16. Reasons for producing food.....	77
Figure 4.17. How long the food can last in the households.....	78
Figure 4.18. Household's source of income	81
Figure 4.19. Distribution of amount spent on food in a month.....	84
Figure 4.20. The LSM score ranges of households of respondents.....	86
Figure 4.21. The crops, vegetables and herbs available in the garden	89

CHAPTER 1

INTRODUCTION

1.1 Background of the study

Food security is a global concern around the world. The latest available estimates indicate that about 795 million people in the world are food insecure with the vast majority of the hungry living in the developing regions (Marx, 2015). Food security is defined as when all people have physical, social and economic access to sufficient, safe and nutritious food at all times, in order to meet dietary needs and food preferences for an active and healthy life (FAO, 2002). This definition forms the basis for the vision of the Integrated Food Security Strategy (IFSS) of the South African government (Department of Agriculture, 2002).

Food insecurity is a global challenge affecting over one billion people (Lundqvist *et al.*, 2010). It is estimated that over 14 million people in South Africa are living in a situation of food insecurity which has contributed to an estimated 1.5 million children under the age of six having stunted growth due to malnutrition (Earl, 2011). Mwaniki (2006) found that in developing countries food insecurity is caused by the inability of households to access sufficient and adequate food due to poverty, and this, in turn, results in ill health.

The world leaders met and adopted the United Nations (UN) Millennium Declaration in 2000 and later set out eight Millennium Development Goals (MDGs) committing to improving the lives of billions of people around the world. The year 2015 marked the final year for meeting

the MDG target 1c, which aimed at halving the proportion of the chronically undernourished. However, economic growth is seen as the key to successfully meeting that target, but it has to be inclusive, as well as provide opportunities for improving the livelihoods of the people living in poor conditions; enhancing the productivity and incomes of smallholder family farmers is key to progress (Marx, 2015).

The Food and Agriculture Organization (FAO) reported a decline in hunger in the global food and nutrition security. The report noted that 805 million people worldwide were chronically undernourished between the year 2012 and 2014; 791 million from that population were living in low-income countries and food access remained a major challenge to food security, particularly in sub-Saharan Africa and parts of Southern Asia (FAO, IFAD & WFP, 2014). In the sub-Saharan Africa, one in every four people, which is approximately 23.2% of the population, is estimated to be undernourished between the years 2014 and 2016 (Marx, 2015).

Even though there is progress in the fight against hunger, an unacceptably large number of people still lacks the food they need for an active and healthy life. Despite the progress that has been made in meeting the MDGs to halve the number of people who are undernourished by 2015 (FAO, IFAD & WFP, 2014), future threats, such as population growth, global climate change, biodiversity loss, and resource depletion, present significant challenges to addressing food insecurity.

Food insecurity is not only about insufficient food production, availability and intake, but it is also about poor quality or nutritional value of the food that people are consuming. The food security concept can be seen in terms of four components outlined by the World Food Programme (WFP), namely availability of food, access to food, utilization and stability (WFP, 2002). To measure food security, “*The State of Food Insecurity in the World 2014*” introduced a suite of indicators (see Table 1.1 below) organized around these four components. The suite of indicators provides a more comprehensive picture of food security, can assist in targeting and prioritizing food security and nutrition policies in the country or around the world.

Table 1.1: Food security indicators

Dimensions	FOOD SECURITY INDICATORS
AVAILABILITY	<ul style="list-style-type: none"> • Average dietary energy supply adequacy • Average value of food production • Share of dietary energy supply derived from cereals, roots and tubers • Average protein supply and average supply of protein of animal origin
ACCESS	<ul style="list-style-type: none"> • Percentage of paved roads over total roads • Road density and Rail lines density • Domestic food price index • Gross domestic product per capita (in purchasing power equivalents) • Prevalence of undernourishment and food inadequacy* • Share of food expenditure of the poor* and depth of the food deficit*
STABILITY	<ul style="list-style-type: none"> • Percent of arable land equipped for irrigation • Value of food imports over total merchandise exports • Political stability and absence of violence/terrorism • Domestic food price volatility • Per capita food production and supply variability
UTILIZATION	<ul style="list-style-type: none"> • Access to improved water sources and sanitation facilities • Percentage of children under 5 years of age affected by wasting • Percentage of stunted and underweight children under 5 years • Percentage of underweight adults • Prevalence of anaemia among pregnant women and children under 5 years • Prevalence of vitamin A deficiency and Iodine deficiency in the population*

Source: (FAO, IFAD & WFP, 2014)

Progress towards improving the food security indicators alone does not only guarantee food security, as compromised utilization caused by poor hygiene can generate nutrition failures which might manifest in high levels of wasting and stunting, while inappropriate diets can give rise to obesity and diet-related non-communicable diseases (FAO, IFAD & WFP, 2014).

According to Sasson (2012), food insecurity is still being seen as a major global concern as one billion people are suffering from starvation, under-nutrition, and malnutrition. It is reported that, across regions, there is a difference in the prevalence and severity of food insecurity at household, regional and national levels, and developing countries retain the highest prevalence of food insecure households (FAO, IFAD & WFP, 2014). Household food insecurity often results from diets which are monotonous and this is a factor which contributes to malnutrition (Kennedy, 2001).

After developing countries had adopted the UN Millennium Declarations, they committed themselves to achieve the eight development goals by 2015. The year 2015 marked the targeted date for achieving the MDGs set by the world leaders at the UN's General Assembly in 2000. However, a significant reduction in global hunger has indeed been achieved over the last two decades. During this period, the prevalence of global undernutrition has been reduced from 18.7% to 11.3% (FAO, IFAD & WFP, 2014) and a total of 72 developing countries out of 129, have reached the MDG 1c hunger target. The number one objective of the MDGs was to "*Eradicate extreme poverty and hunger*". FAO's report concluded that, even though there was a reduction in global hunger, the developing countries were still far from realizing MDGs number 1.

Latin America and the Caribbean have achieved the best regional reduction in food insecurity over the last two decades (FAO, IFAD & WFP, 2014). While Eastern and South-Eastern Asia have already achieved most of their MDG hunger targets, the prevalence of hunger in southern Asia has declined at a slower rate. The prevalence of hunger in Northern Africa has been consistently less than 5% over the last two decades, while its prevalence in sub-Saharan Africa has ranged from 23% to 33% (FAO, IFAD & WFP, 2014). Despite the current progress in food insecurity, natural and human-induced disasters or political instability continue to be a challenge in many countries and have resulted in crises with increased vulnerability and food insecurity of large parts of the population.

In 2010, the estimates of people who were suffering from hunger were 578 million in the Asia Pacific region, 53 million in Latin America and the Caribbean, 37 million in North Africa, and, lastly, 19 million in developed countries. In sub-Saharan Africa, the number of people suffering from hunger is estimated at 239 million, and this figure could increase in the near future (Marx, 2015). People residing in both rural and urban settlements suffer from food insecurity and poor nutrition caused in large measure by poverty and lack of nutritious foods (Tonukari & Omotor, 2010). Food insecurity and malnutrition in developing countries result in serious public health problems and loss of human potential (Pinstруп-Andersen & Cohen, 2000).

1.2 Problem statement

According to Altman *et al.* (2009), household food security is multi-dimensional and it changes over time. South Africa faces a structural food insecurity problem, the prime cause of which is widespread chronic poverty and unemployment. While there is a growth in

demand for food, land and water resources are also becoming even more scarce and degraded (FAO, IFAD & WFP, 2014). Agricultural growth has the potential to increase access and availability of foods that are healthy and affordable (Sasson, 2012).

Food insecurity has emerged as a global crisis, with sub-Saharan Africa showing the highest percentage of people affected by severe food insecurity (FAO, IFAD, UNICEF, WFP & WHO, 2017). It is evident that, while there are improvements in addressing transitory shocks to food security in the region, chronic food insecurity remains high. Food insecurity is worsened by population growth that results in the need for increased quantities of food required to feed millions of households. Another risk factor of food insecurity is the rise of food prices and this is aggravated by the fact that the majority of sub-Saharan countries import food; agricultural development is still low due to scarce resources (United Nations, 2012:2).

Whilst improvements have been made on food security in southern Africa, the problems that continue to be faced not only illustrate the complex nature of food security, but also suggest that different dimensions require joint approaches to improve the food security situation. Measures that need to be focused on should look at accessibility to nutritious and adequate diets and at the overall living conditions of the poor people, in order to prevent any negative outcomes such as underweight, wasting and stunting in children. It is clearly stated in *“The state of food insecurity in the world 2014”* that the greatest challenges in food security remain in sub-Saharan Africa, and this slows progress in improving access to food and income growth, as well as in addressing poverty and poor infrastructure, which hinder physical and distributional access (FAO, IFAD & WFP, 2014).

Food insecurity in the households and among individuals remains as much of a concern in South Africa as it is in many other developing countries (Abdu-Raheem & Worth, 2011). The rate of food insecurity is high in the rural areas as a significant number of households are considered resource-poor, and suffer high stunting rates. Altman *et al.* (2009) state that access to adequate food at household level increasingly depends on how food markets and distribution systems function rather than only on total agro-food output. This is due to multiple factors, access to income and resources that influence access to food.

The causes and consequences of food insecurity are often complex and interconnected. As such, they cannot be addressed adequately at the national level and often require a broader regional or global co-operative and interdisciplinary approach (Belesky, 2014). The consequences of food insecurity include hunger, malnutrition, as well as having a negative effect on health and quality of life. Hunger and under-nutrition are both outcomes of inadequate food intake, while stunting is associated with long-term inadequate nutrient intake and frequent infections.

For the Programme Household Food Security (PHFS) to work effectively, any challenges that hinder its success and implementation should be identified. However, research on the project's impact has not been conducted. It is critical to assess the access to nutritious food by households participating in the programme and also to investigate all factors (internal and external) which are likely to influence the programme's effectiveness.

1.3 Purpose of the research

1.3.1 The aim of the study

The aim of the study is to investigate access and practices which lead to increasing a household's access to nutritious food through participation in the Household Food Security Short Learning Programme offered by the University of South Africa to the students who have registered for the course.

1.3.2 Objectives of the study

- To determine the socio-demographic profiles of the households;
- To determine household access to nutritious foods and diverse diet;
- To determine practices used to promote diet diversity in the households; and
- To identify factors (challenges, strengths and weaknesses) as perceived by the students.

1.4 The layout of the dissertation

Chapter 1: Introduction

The first chapter is an introduction which provides a background of the study. The section outlines the problem statement, the purpose of the study and also explains the layout of the study.

Chapter 2: Literature Review

This literature review chapter focuses on a review of the specific literature on food security, food access and food or home gardens.

Chapter 3: Methods and Materials

The selected research methodology used in the study is discussed. The study site and the study population are identified in this chapter. Sampling methods and procedures, as well as data collection and data analysis methods, are also discussed.

Chapter 4: Results and Discussion

This chapter focuses on the major findings of the study. The results of the study are also discussed in relation to the findings of other studies.

Chapter 5: Conclusions and Recommendations

The chapter draws conclusions from the findings and discusses whether the original objectives of the study were addressed. Based on the results of the study, recommendations are presented for future actions and research.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Food security is a flexible concept as reflected in the many attempts in research to define it. Food security has been used to describe the country's ability to access enough food, in order to meet dietary energy requirements (Pinstруп-Andersen, 2009). Stats SA (2014) defines a household as a "group of people who live together and provide themselves jointly with food and/or other essentials for living, or a single person who lives alone". Several factors, such as socio-economic, political and climate conditions, may pose a threat to food security in a country.

This chapter aims to provide a detailed literature on the food security concept, through identification of the causes and consequences related to food insecurity. It briefly outlines literature on the determinants of food security at the household level. The definitions and the types of food security measurements used for this study are discussed.

2.2 Definition of food security

Food security as a concept originated in the discussions of international food problems at a time of global food crisis in 1974 (Lovendal & Knowels, 2006). Presently, food security is defined as existing "when all the citizens have physical, social and economic access to adequate, safe and nutritious food at all times in order to meet their dietary needs and food preferences for an active and healthy life" (Bokeloh *et al.*, 2005). There are four dimensions

of food security, namely availability, accessibility, utilization and stability of food. These four dimensions are important in ensuring optimal nutrition for individuals. There are many ways and means to measure all the dimensions and different methodologies may be used according to the purpose of the measurement (Velazco & Ballester, 2016). Each dimension has a set of indicators, which are used as a measure for food insecurity at the individual, household, community and national levels.

Several food security indicators that are available could be used for household food security analysis and monitoring on a global scale. However, the variation among the indicators is significant; they all focus on different and specific dimensions of food security. Some are multi-dimensional, while others are quantitatively or qualitatively based on perception and self-assessment (Carletto *et al.*, 2013). The indicators may also be used for monitoring and evaluation purposes, targeting emergency projects. Some play a role in the advocacy of certain key issues, while others contribute to the global monitoring of progress towards international policy objectives (Barrett, 2010).

2.2.1 Food availability

Food must be available in sufficient amounts and it should be of appropriate quality. Availability of food refers to the physical existence of food, either from own production or purchased (Bokeloh *et al.*, 2005). Food availability is a combination of nutritious and good quality food from domestic food production, food imports, food aid, and domestic food from local, regional, national and international sources (Ruane & Sonnino, 2010). Food availability was considered a synonym to food security as previously agreed in the 1974 world food conference (Lovendal & Knowels, 2006). It was later discovered that the country might have enough agricultural produce while its household members lack access to adequate food (Altman *et al.*, 2009).

2.2.2 Food accessibility

Food accessibility refers to the ability of the nation and its households to acquire sufficient food on a sustainable basis; they must have access to adequate resources. Food in the households can be purchased directly from the shops or produced. Carletto *et al.* (2013) argue that the nation's food availability and household incomes determine access to food by households and individual. Such access to food may be obtained either through the direct production of food crops, market purchases of food, or through in-kind food transfers. Access to food is improved through direct food or cash transfers, school feeding programmes, food aid and cash transfers that are used to purchase food. Other interventions which can be used to enhance access to food include national grain reserves to stabilize food supplies, fertilizer subsidies to ensure access to inputs for poor smallholder farmers, and food price subsidies to protect access to food for poor consumers (Devereux, 2015).

To ensure food security at the household level, the household must have access to food and a stable income or purchasing power. In a rural setting, a household needs access to and ownership of land to produce food or to have a reliable source of income to secure food (Sakyi, 2012). Even though farming remains important for rural households, people also look for other opportunities, which they can use to increase and stabilize the household's income. Hence, the extent to which households can feed themselves also depends on non-farm income, which varies across countries and regions (Abdu-Raheem & Worth, 2011). It was reported in the rural villages of Tanzania that half of the household's income came from crops and livestock production and the other half from non-farm wages such as employment, self-employment and remittances (Ellis, 2003).

Although food access is the main focus of most food security research and surveys, there is no precise measurement of access. However, the Dietary Diversity Score (DDS) is one of the alternative measures that has been proposed over the years to measure food access. The DDS tool is of particular importance in developing countries where the diets are composed mostly of starchy staples, a few or no animal products, and a likelihood of high quantities of fats and sugars. The FAO report of 2008 illustrated that agriculture plays a significant role towards food security in the country. The report stated that the majority of people were in direct need of food especially those who are living in the rural areas. The report, furthermore, revealed that the majority of people living in rural areas had access to land but lacked the necessary skills and access to resources to support farming.

According to Ndhleve *et al.* (2012), inadequate access to food and poverty are prevalent problems among the rural people of South Africa, and poor households are increasingly failing to afford and procure food. Empowering people to grow their own food for subsistence or income generation will provide nourishment and potential income to many people in the country. A pilot study done in Sekhukhune in the Limpopo Province of South Africa indicated that the causal factors of food shortages in households include inadequate and inappropriate knowledge as well as an inadequate supply of nutritious foods (Faber *et al.*, 2009). Proper use of locally available community resources and community-based nutrition education could change the attitudes and beliefs of community members (Department of Agriculture, 2006).

2.2.3 Food utilization

Food utilization refers to the ability of a person, household or a population to select the food that they prefer, as well as get essential nutrients from the food. Where nutritious food is sufficient, available and accessible, the household will have to make decisions concerning

how the food is purchased, prepared, consumed and allocated among household members. If the food distribution is unequal in the household, some individuals may suffer from food insecurity, while others will be food secure (Bokeloh *et al.*, 2005).

Food utilization can be limited by factors such as access to clean water, inadequate sanitation, food choices in all age groups, health status (Ruane & Sonnino, 2010), loss of nutrients during food processing and preparation and lack of proper care; all these may have a negative effect on the health of household members (John *et al.*, 2009). The provision of safe drinking water, control, treatment, and prevention of disease, together with proper nutrition education, will contribute to the improvement of food utilization (John *et al.*, 2009).

2.2.4 Food stability

Stability of food refers to a situation where a person, household or population has sustained access to adequate nutritious food at all times. It means that food must be secured to the population, household or individual at all times and that they should not risk losing access to food as a consequence of sudden shocks due to economic, climatic cyclical events (FAO, 2006). The stability of food, therefore, refers to both the availability and access of food.

2.3 Measurement of food security at the household level

There is no straight measurement for food security, as it cannot be separated from other developmental factors such as the location in which the household is situated (urban or rural community), the household size, education and nutritional knowledge and the income status of the household (source of income, health status of the household members, food production and employment status of the household) (Altman *et al.*, 2009). The FAO has

stated that there is no single measure which is perfect that can capture all aspects of food insecurity (Webb & Rogers, 2003). In South Africa, there is no definite and accepted measure for food security, and this, in turn, creates differences in the status of food security. Policymakers find it difficult to address food insecurity as their ability to find suitable interventions for different conditions and needs are limited (du Toit *et al.*, 2011).

Dietary diversification is a recommended approach that is being used to alleviate nutritional problems resulting from food insecurity and inadequate micronutrients intake (Hoddinott & Yohannes, 2002). Diet diversification refers to the number of different food groups or foods that are consumed over a specific time period (Ruel, 2002). Dietary diversity has been positively linked with the three pillars of food security, namely availability, accessibility and utilization (Steyn *et al.*, 2006; Hillbruner & Egan, 2008). It is considered as an outcome measure of food security mainly at the level of the individual or household food access. However, it can also provide other information such as food availability in the community, as well as reflect seasonal changes in dietary patterns, an aspect of the sustainability of the food supply (Kennedy, 2009). Vakili *et al.* (2013) suggested that dietary diversity could be used in two ways, firstly as a proxy measurement in food accessibility and secondly as a reflection of dietary quality at the individual level.

With several dietary diversity measurements, which can be used as a proxy to food consumption, the two most common are the Household Dietary Diversity Score (HDDS) and the Individual Dietary Diversity Score (IDDS). HDDS is the standardized tool used to estimate household food security (Thorne-lyman *et al.*, 2013). While, the IDDS can be used to reflect the individual's intake of energy and other important nutrients (Kennedy *et al.*, 2010), the HDDs can serve as a useful indicator of household food security. Most dietary

guidelines recommend that people should eat a variety of foods within the food groups (Fogli-Cawley *et al.*, 2006). Eating a variety of foods is associated with a number of improved outcomes such as nutrient adequacy, anthropometric indices and improved haemoglobin concentrations (Swindale & Bilinsky, 2006). Thus, Steyn *et al.* (2013) recommended the consumption of a variety of foods in South Africa's food-based dietary guidelines for the same reasons.

When a dietary diversity score is measured at the household level, it reflects the economic ability of a household to consume a variety of foods (Coates & Swindale, 2007) and it is considered a good proxy measure of household energy availability (Hoddinott & Yohannes, 2002; Ruel, 2002). This also provides a clear understanding of how individual households are affected by food insecurity and how these households react to the circumstances related to food insecurity (Qureshi, 2007). It is important to identify appropriate measures for food security, in order to distinguish households which are food secure from those which are food insecure, as well as to characterize the cause of food insecurity (Hoddinott & Yohannes, 2002). The HDDS measurement tool has been widely used in many developing countries and it indicates a positive relationship between dietary diversity and nutrient adequacy (Kirkland *et al.*, 2011).

2.4 Causes of food insecurity

Food insecurity is defined as a situation that exists when people lack secure access to sufficient amounts of safe and nutritious food for normal growth and development and an active and healthy life (Devereux, 2015). In developing and developed countries, the reasons for household and individual food insecurity are complex. The inability of individuals or

households to afford appropriate food choices (healthy diets) and a difficulty in accessing stores are amongst the more obvious causes (Gordon & Dooley, 2015).

Food security is also affected by unstable social and political environments such as slow economic growth, war and civil unrest, imbalances in trade, natural resource limitations, poor human resource base, gender inequality, inadequate education, poor health, natural disasters and the absence of good governance (Mwaniki, 2006). All these are factors that contribute to insufficient national food availability or insufficient access to food by households and individuals. Pinstруп-Andersen (2009) explains that household food insecurity is due to factors such as individual food preferences and other household needs, which include school fees and housing, food distribution or requirements for each individual. Once more, good nutrition of each individual depends on a set of non-food factors such as sanitary conditions, water quality, infectious diseases and access to primary health care (Pinstруп-Andersen, 2009).

2.4.1 Population growth and urbanization

In developing countries, among the many challenges to achieving food security is rapid urbanization, which is accompanied by a strong economic growth. This also leads to a reduction in the workforce and the necessary skills needed in rural areas, as well as a decline in food production (Mutisya *et al.*, 2016). Urbanization results in the population shifting from the rural areas to urban areas. In most cases, this shift has led to the growth of an urban poor population living in slums and informal settlements and, in these informal settlements, there is limited access to land, basic services, resources and urban agriculture (Mutisya *et al.*, 2016). The main reason for rural-urban migration in southern Africa is due to economic reasons (Frayne *et al.*, 2010). The growing urban population, especially the urban

poor poses risks to achieving social, economic and health development in low and middle-income countries (Ravallion *et al.*, 2008). Furthermore, the population that is moving to the cities is in search of employment and, thus, is more vulnerable to food insecurity (United Nations, 2003).

According to Tonukari and Omotor (2010), populations that are poor and under-nourished, in the developing countries, prefer to live in the cities than in rural areas. The increase in human population and consumption has led to an increase in the demand for food, and challenges in maintaining a balanced diet in both the developed and the developing world (Tonukari & Omotor, 2010). Growing global populations alongside changes in dietary patterns and energy consumption have increased demand for agricultural products such as food, animal feed and biofuel feedstock (Mitchell, 2008).

2.4.2 Poverty

In South Africa, there are strong links between vulnerability to food insecurity and economic and demographic indicators linked to poverty and well-being of the population despite being a middle income and food secure country. A large number of households are food insecure due to poverty (Manyamba *et al.*, 2013). Poor households are characterized by no income or low income and are unable to meet the nutritional needs of their members. They often rely on other forms of income (informal and seasonal employment) or other food sources, in order to meet household needs (Department of Agriculture, 2002).

The importance of being able to earn an income means that an individual or the household will also be able to stay healthy, access to credit and food. As the food prices increase, households without enough income will not be able to purchase sufficient food to consume,

resulting in food insecurity and increased risks of illness (Tonukari & Omotor, 2010). Even though employment opportunities have increased in the country, they still do not address the challenges of poverty and food insecurity.

2.4.3 Health conditions

Other causes of food insecurity are poor sanitation and infectious diseases leading to poor health. Furthermore, the high prevalence of diseases, such as malaria, tuberculosis and Human Immunodeficiency Virus (HIV), reduce human resources required to contribute in agriculture and the household's ability to acquire food (Mwaniki, 2006). According to Manyamba *et al.* (2013), "HIV prevalence increases child malnutrition and deaths due to loss of families, the breadwinners in the households, families end up being pushed into a cycle of poverty and deprivation, with children being the immediate victims".

Other non-food factors which are causes of food insecurity are poor water quality and poor access to primary health care (Pinstrup-Andersen, 2009). To address nutrition security, access to food should be combined with access to clean water and good sanitation. The food should be safe and well prepared, in order to provide essential nutrients when consumed (Barrett, 2010).

2.4.4 Other factors related to food insecurity

Gustavson *et al.* (2011) report that food insecurity is not only caused by the country's capacity to produce sufficient food, but also by the amount of food wastage. Reducing food that is wasted in the food system could assist countries to feed their citizens on agricultural land, limit inputs in agriculture and the environmental damage caused during food production (Modirwa & Oladele, 2012).

Food waste is becoming an increasingly significant global issue (Aliber & Hart, 2009). Food is wasted throughout the Food Supply Chain (FSC), from agricultural production down to the final consumption by the households. In addition, food is thrown away even while it is suitable for human consumption. The most common reason for food being wasted may be due to people buying more food than what is going to be consumed (Waste Resources & Action Programme, 2008).

2.5 The consequences of food insecurity

Approximately one billion people are food insecure, while overeating and food waste is common among more than one billion people (Lundqvist *et al.*, 2010). The National Food Consumption Survey of 2005 revealed that a large proportion of South African households are food insecure, that 52% of the households experience hunger; and that the remaining 30% are at risk of hunger (Labadarios *et al.*, 2009).

Food insecurity has the potential to influence the food intake, health and nutritional status of households. The relevant indicators of its interaction with nutrition, are conditions such as child underweight and stunting; about two billion people suffer from micronutrient deficiencies (Wheeler & Von Braun, 2013). Food insecurity results in hunger, vulnerability and malnutrition. The cause of hunger and malnutrition is not mainly due to a shortage of food, but rather to an inadequate access to food in South Africa. Malnutrition and hunger may also be due to a lack of nutritional diversity. A diet low in proteins, vitamins, minerals and essential micro-nutrients leads to nutritional deficiencies (Faber *et al.*, 2010).

Undernutrition is an outcome of undernourishment, and/or poor absorption and/or poor biological use of nutrients consumed because of repeated infectious disease (Matrins *et al.*, 2011). Food insecurity can affect household members differently, with varied nutritional status outcomes depending on their age and gender (Nanama & Frongillo, 2012). In children, the consequences of insufficient food and nutrients can affect cognitive and mental development and has been linked to poor school achievement and behaviour abnormalities (Matrins *et al.*, 2013). Lack or poor access to nutritious and adequate diet may result in maternal overweight. Diets which are high in energy and poor in micronutrient content will lead to micronutrient deficiencies in children, and this limits growth and development and may also result in overweight and obesity later on life (Garrett & Ruel, 2005).

Women, in particular, may be vulnerable to food insecurity due to gender inequalities. The roles they play within households, and because of adjusting their nutrition to buffer the effect of food insecurity on their children (Dubois *et al.*, 2011). In addition, undernutrition can be a vicious cycle affecting the health and quality of life of generations, as the undernourished adults are more likely to give birth to infants with low birth weight, which has been associated with increased risks of chronic disease conditions (Victora *et al.*, 2008).

2.6 Food security in South Africa

South Africa (SA) is a developing country with a growing population. In 2016, Statistics South Africa (Stats SA) estimated that the mid-year population was 55.91 million (Stats SA, 2016). South Africa ranks among countries with the highest rate of income inequality in the world and yet it is considered food secure. The country is deemed food secure at a national level, as it is producing sufficient or nearly sufficient staple foods, with the capacity to import food if

needed in order to meet the basic nutritional requirements of its population (du Toit *et al.*, 2011). However, affordability and availability of this food to its individual members, has recently become a major concern.

Stats SA reported that, between 2002 and 2014, households that experienced hunger decreased from 29,3% to 13,1%, while the percentage of individuals who experienced hunger decreased from 23,8% to 11,4% (Statistics South Africa, 2014). The General Household Survey reported that the percentage of South African households with inadequate or severely inadequate food access decreased from 23.9% in 2010 to 21.5% in 2012 (Statistics South Africa, 2012).

The South African political history has played a big role in increasing poverty and food insecurity challenges, and these factors are still common in the African society. Before the 1994 democratic elections, the majority of South Africans were denied political rights and participation in economic activities, resulting in social and income inequalities around the country (Lund, 2008). The arrival of democracy was associated with political and economic advances shifts and, according to Labadarios *et al.*, (2009) “the country continues to face poverty, unemployment and, more recently, steep food and fuel prices, high energy tariffs and increasing interest rates”. This influenced the country to focus on concerns of poverty and food insecurity, with more emphasis being placed on developing a comprehensive food security strategy.

Several studies have indicated that households in the urban and rural areas of South Africa are vulnerable to food insecurity (Hendriks, 2005; & De Cock *et al.*, 2013). Some of the South African people are still struggling to meet their basic needs in the household and,

because of these negative conditions, they are under severe pressure. Machete *et al.* (2004) further argue that household food insecurity is more prevalent in rural areas than in urban areas. The IFSS for South Africa report stated that 75% of those food insecure households were poor people from rural areas. The situation is worsened by a lack of support for farmers resulting in low agricultural produce (Department of Agriculture, 2002). Poor people suffer from a lack of employment or they are employed in insecure seasonal jobs. They rely on government social grants (old age pensions, child support and disability grants) and private transfers from working relatives and neighbours (Department of Agriculture, 2006).

Access to nutritious food is essential for the well-being of the people and human development. Food security is, thus, of crucial importance in the country; it must be protected and it is the state's duty to ensure that food security is secured at both national and individual levels. Section 27 of the Bill of Rights states that food is a basic human right. The Bill of Rights obligates the state to provide and means and resources, as well as legislation and other supporting measures to ensure that all citizens are enabled to meet their basic food needs.

The South African government adopted the IFSS in 2002 whose vision is to attain "universal physical, social and economic access to sufficient, safe and nutritious food by all South Africans at all times to meet their dietary and food preferences for an active and healthy life" (Department of Agriculture 2002). The strategy was formulated by the Department of Agriculture to promote food security and it aimed to "establish short-term food programmes such as food gardens to augment food shortages in rural households and to sustain long-term food security for all" (Drimie & Ruysenaar, 2010).

The IFSS aimed to reduce challenges that are faced by food insecure people in South African. Firstly, the IFSS approach focused on food security interventions which ensured that people gained access to productive resources and, secondly, to improve access to income and job opportunities. Thirdly, the IFSS promoted nutritious and safe food, and fourthly, where the people are unable to access sufficient food due to disabilities or extreme conditions of deprivation, interventions should ensure that they are provided with relief measures (short to medium-term) that can sustain them. Lastly, food security interventions were to proceed from an analysis that was grounded on accurate information and the aim was to eradicate hunger, malnutrition and food insecurity in the country (Department of Agriculture, 2002).

The National policy on food and nutrition security stated that South African citizens have inadequate access to knowledge, relevant information regarding food security and resources to make optimal choices for nutritious and safe diets; where productive land is available, it is not always utilized for food production (Department of Social Development, 2013).

2.7 Food security at a household level

Food security is regarded as a basic need which households when allocating their budgets and resources, aim to satisfy alongside the other household needs (Carletto *et al.*, 2013). Household food security is the application of the food security concept at family level where individuals within the household are the main concern. A household is considered to be food secure when it has the ability to acquire nutritious food necessary for an active and healthy lifestyle for its members (Pinstrup-Andersen, 2009). Even though the household may be considered to be food secure, it may not assure food security for all its members.

In terms of food affordability, the increases in food prices have been noticed to have an impact on the level of household food security. In South Africa, 60% of the households are food insecure; the impact is extreme as the poor populations spend a large proportion of their income on food (du Toit *et al.*, 2011).

2.8 Household food security, food access and food gardening

Across the developing countries, the majority of the poor live in rural areas where family farming and smallholder agriculture are predominant (Marx, 2015). Access to food is an issue not only in the rural settings, but also in the urban areas. Equal access to nutritious healthy foods by the population is a basic right for all human beings; without this access, it is difficult to maintain a proper level of health. An adequate and sufficient food supply is necessary for eliminating hunger.

Food accessibility encompasses access to adequate resources (entitlements) needed to acquire nutritious foods for a diverse diet. The resources or entitlements are defined as the set of all commodities which a person can establish or command, given the legal, political, economic and social arrangements of the community in which the individual lives (Barrett, 2010). It is necessary to improve access to adequate and nutritious food because it contributes to a healthy diet, which increases one's physical activity and prevents obesity (Drewnowski & Specter, 2004).

Growth in family farming and smallholder agriculture through labour and productivity has a significant positive effect on the livelihoods of the poor as it increases food availability and incomes. While food insecurity remains highly prevalent, agricultural growth has the potential

to increase accessibility and availability of foods that are both healthy and affordable (Food and Agriculture Organization, 2012). An increase in the consumption of plants in the human diet would also have a significant benefit on health (Godfray *et al.*, 2014).

The primary importance of food in the agriculture sector is to improve household food security, to alleviate, and prevent malnutrition. Home gardening is very popular in the country and it plays an important role in providing access to food for the household. Identifying and understanding the challenges involved in the gardening activities can provide households with an opportunity to be successful in the development of a successful home garden and contribute significantly to increased involvement within the food system. Food security is regarded as the product of effective food systems. The food system is defined as a set of interrelated functions involving food production or farming, processing, preparation, distribution, acquisition and consumption by individuals, communities, and the populations (Cassidy & Patterson, 2008).

2.9 Home gardens role in achieving household food security

Since food security definitions encompass the aspects of food availability, access, and utilization, it is evident that various projects and programmes should be available to improve food security. The most common response to food insecurities among the population is through food production, which at some point is not an ideal option because not all land available in South Africa is suitable for crop production (Devereux, 2015). Own food production increases the availability of balanced diets by providing plant-based foods (fruits, vegetables and pulses) which are rich in micronutrients and plant proteins (Schreinemachers *et al.*, 2014).

FAO (2004) reports that the experience of some countries indicates that a comprehensive approach to the provision of support services to achieve growth in the smallholder agricultural sector is essential to achieve food security. In the absence of support for farmers, the people involved will find it difficult to escape poverty and agriculture's role of creating livelihood opportunities will remain limited. In 2010, FAO reported that hunger, a manifestation of poor food access among households in the world, had become a public concern over a significant portion of the world population; about one billion people in the world are reported to be hungry, meaning that one person in seven people suffers from food insecurities (Food and Agriculture Organization, 2010).

A household garden is commonly known as a plot where fruits, plants and vegetables are cultivated, and it is usually near the house. Even poor and landless people practice gardening on small patches of homestead land, vacant lots, roadsides or edges of a field, or in containers. Home gardening usually involves manual labour and traditional techniques for managing the gardening area and plants (Galhena *et al.*, 2013). These households may use traditional tools such as hoes, billhooks, sickles; irrigation systems such as water canals, watering cans; and other traditional practices such as manual weeding and pest removal for the gardening activities. In the home garden, different crops, such as vegetables, fruits and herbs, are grown throughout the year for a household's own consumption, and this is potentially integrated with animal production (Keatinge *et al.*, 2012). Such food production can contribute to improved nutrition by increasing the quantity and quality of foods produced and available for household consumption.

Households use home gardening as a way of ensuring direct access to food and for income generation; this is common among people living in the rural areas. Gardening is crucial to

rural populations as they have available land, which is usually near the homestead (Wenhold *et al.*, 2007). The Helen Keller International (HKI) interventions indicate that households which have access to a developed homestead garden have more varieties and higher quantities of vegetables available for consumption and that this is an important lesson for South Africa, particularly in terms of how own production can improve dietary diversity (HKI, 2010).

Any farmer with unlimited access to sufficient inputs, knowledge and skills can, therefore, produce large amounts of food. Strengthening this form of homestead food production is an important future element in increasing household access to food (West & Mehra, 2010). Most South African households do mixed farming; this is where the production of crops and animals is done on one plot, usually residential land (Wenhold *et al.*, 2007). It is advantageous to use this type of farming for the household as it is easily accessible and the family is able to care or look after their crops and stock from time to time.

The World Bank reported that home gardens are known for their success stories as providers for food security and alleviators of hunger; agriculture is seen as a source of livelihoods for about 86% of the rural people in sub-Saharan Africa. The report further noted that agricultural production is important for food security as it is a source of income for the majority of the rural poor (The World Bank, 2008). Crossney *et al.* (2012) indicate that food gardens are a positive addition to any neighbourhood (rural or urban settings) as these gardens have the ability to positively affect an area's food environment, as well as provide additional positive social benefits.

Farming on food gardens appears to be on the increase in the developing African countries. An estimated population of four million South Africans engages in smallholder agriculture for various reasons, and the majority of these people are in the rural areas (Aliber *et al.*, 2005).

Hart and Aliber (2010) reported that approximately three million small-scale agriculture farmers produce food primarily for household consumption and the majority of those involved are women farmers. The study also highlighted that home food production addresses food shortages and results in reduced incidents of hunger. Where food and crops are produced, the producers and their families may directly eat the produce in the household or sell the crops to the community, thereby increasing access to food, and generating income. The food produced may also be used by the households or communities in times of need, for example, when food is out of season or the family has no income.

The food which is grown in the garden is consumed while it is fresh (Litt *et al.*, 2010) and this may increase dietary diversity (Swindale & Bilinsky, 2006) and potentially improve the nutritional status of household members or individuals who are consuming the food (Maxwell, 1995). Furthermore, households who practice food production reduce their dependence on purchasing food from the markets and the produce also provides them with a source of income for other household needs (Botha *et al.*, 2003).

It has been found that households with access to a home garden have an increased dietary diversity (Department of International Development, 2014). This indicates that rural households with access to home gardens are more likely to move from a medium dietary diversity status into a high dietary diversity status. The observed link could be based on the fact that, home gardens normally provide a variety of horticultural crops rich in micronutrients

such as vegetables, fruits and tubers (Tarvinga *et al.*, 2013). The important element to ensure food security for a household is to produce food to eat and possibly sell the surplus. (Bonti-Ankomah, 2001).

Therefore, the combination of nutrition education, counselling and the promotion of home gardens is an effective strategy for improving household food security (Berti *et al.*, 2004). Promoting home gardening is essential. Benefits of home gardening to the targeted populations include sustainability, cost-effectiveness, income generation and cultural acceptability. Home gardening has a positive impact on human nutrition for all the individuals involved by providing a variety of fruits and vegetables in sufficient amounts to enable all household members to eat a nutritionally adequate diet (Wenhold *et al.*, 2007). Increased attention should be given to indigenous knowledge and agro-biodiversity in the communities to fight and improve any agricultural constraints hindering production and enhance sustainable livelihoods (FAO, 2011).

2.10 Training interventions for improving food security

There are many programmes and projects that can be implemented to solve the problem of food insecurity, and yet there are still millions of people who are food insecure around the world; the majority of these people live in African developing countries (Food and Agriculture Organization, 2011). Food and nutrition problems in low-income populations are complex and they require a strategic plan that can adequately include and cover the factors involved.

Many public and private programmes were initiated to address food insecurity and alleviate malnutrition. The private interventions programmes may include food assistance

programmes such as regional food banks, local food pantries, soup kitchens, and shelters and these food assistance programmes have grown rapidly over the past decades (Martin *et al.*, 2013). In developing countries, including SA, school nutrition programmes were introduced in the country to address malnutrition problems in children. The aim of the National School Nutrition Programme (NSNP) is “to improve primary school pupils active learning capacity, alleviate temporary hunger, educate pupils about nutrition, improve micronutrient intakes and enhance broader development initiatives” (Bonti-Ankomah, 2001).

An increased involvement in population development is essential to accelerate food security improvements. In agricultural areas, education works directly to enhance the ability of farmers to adopt advanced technologies to enable them to manage their crops and this, in turn, will increase production on the land (Skinner, 2011). Moreover, education encourages movement into more remunerative non-farm work, thus increasing household income. Nutrition education is regarded as an important means by which people can improve their nutrition knowledge and gain the necessary skills needed for developing good dietary habits (David *et al.*, 2008). Nutrition education is essential for ensuring effective linkages between garden food availability and consumption.

To implement nutrition education projects or activities, programmes need to consider factors such as knowledge transfer and thorough analysis of the nutrition situation for the targeted population, planning, careful selection of the strategies or methods, implementation, and a clear definition of the procedures and instruments for monitoring and evaluation of that programme. Promotion and strengthening of household food security with nutrition education equip individuals, households, as well as communities with skills which are required to

integrate household food security and nutrition concerns in development programmes (Drimie & Ruysenaar, 2010).

The HKI recognized and linked gardening and nutrition education activities to the ongoing development programmes (Talukder *et al.*, 2000). An understanding of the indigenous ways of gardening, food selection, preparation, feeding practices and constraints can guide nutrition education to achieve sustainable behavioural changes.

Calderon (2001) reported that the training of regional and field staff working in low-income areas is an educational approach that is necessary to improve the population's performance. The paper further illustrates that appropriate nutrition education intervention may have a positive effect on the improvement of the food and nutrition conditions in those low-income populations. It is important for projects or programmes that are focusing on nutrition education to combine two or more nutrition-related interventions rather than working on one aspect. Interventions that can be included as part of the nutrition education programme targeted on individuals and communities may include breast and infant feeding, growth monitoring, food, personal and environmental hygiene, food preparation, processing and preservation and many other aspects which are important to the health of the people.

2.11 Household food security short learning programme's objectives

The Programme in Household Food Security (PHFS) was introduced in 2009 as a short learning programme at the University of South Africa (UNISA) with support from the South African Institute for Distance Education (SAIDE). The programme was made possible through donor funding provided by the 'WK Kellogg Foundation'. Food and nutrition security is evident in the MDGs, and the programme emphasizes its aim to attain this goal.

Programme implementation included other networks such as Non-Government Organizations (NGOs) and Community Based Organizations (CBOs) running initiatives within the communities. It targets individuals with a senior certificate and those who are working in the community as volunteers. The programme aims to equip them with skills to become household food security facilitators and also to be change agents in their communities.

The main objective of the programme is to sustain livelihoods and alleviate poverty in rural and peri-urban areas through skills development, capacity building and values (using resources that the households together with the communities already have to attain food security). Household participation is essential in the programme activities as active participation can contribute to addressing the poverty and under-nutrition challenges faced by communities through linking food, nutrition and household gardens to their situations.

Initially, there is a great success in many projects soon after their introduction, but they soon collapse when the artificial support is removed by the funders or when government extension support is lacking (Chambers, 1995; Tahyudin *et al.*, 2015 & Lybbert *et al.*, 2004). Participatory research approaches are crucial, in order to investigate issues of concern which are related to resource-poor communities and, in order for agricultural scientists and rural communities to plan, implement and evaluate rural development strategies jointly (Leeuwis, 2000; Wiggins *et al.*, 2010).

2.12 Summary

Food insecurity is widely spread around the world despite the various advances that have taken place over the past few years to improve the living conditions and the food security status of the population. Hunger and undernutrition are both outcomes of inadequate food intake, while stunting is associated with eating food with a deficiency in micronutrients. Food insecurity results in poor child development, weak educational achievement and school performance, poor diet and nutritional status. Measures to improve access to safe drinking water, sanitation and adequate health services should be taken into consideration.

There are many programmes and projects aimed at solving the food insecurity crisis, and yet, there are still millions of people who are food insecure around the world. Food insecurity is a complex issue requiring a strategic plan, which can adequately include and cover the factors involved. Nutrition education is regarded as an important aspect, which can help the people improve their knowledge and gain the necessary skills needed for developing good dietary habits.

CHAPTER 3

METHODS AND MATERIALS

3.1 Introduction

Research is a purposeful and systematic approach to problem-solving which begins with identifying a question based on a structured problem in any situation (Matthews & Kostelis, 2011). There are various types of methods used to conduct research; this study is descriptive in nature. The purpose of descriptive research is to outline an appropriate description of an issue or characteristic of a particular situation (Kothari, 2004). Descriptive research methods were used to assess food security access by identifying the socio-economic and demographic variables, in order to determine the current condition of household food security.

The purpose of this chapter is to describe the research method used in this study. The chapter describes the research design, gives the outline of the research conducted and the models used for data analysis. An overview of the study area and an outline of demographic characteristics are also presented in this chapter. The chapter ends with a summary and concluding remark on the methodology.

3.2 Population and study area

Western Cape is one of the largest provinces in South Africa and the common language spoken in the province is Afrikaans. The Western Cape has an estimated population of

approximately 6 200 100 million, which represents 11,3 % of the total population of South Africa (Stats SA, 2016).

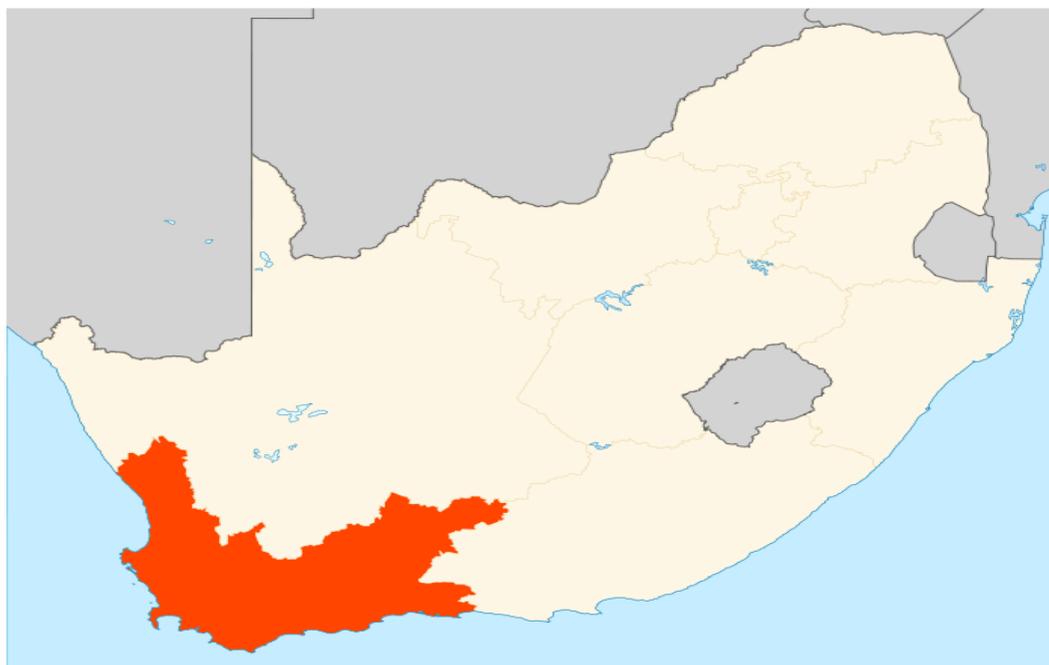


Figure 3.1. Map of South Africa (Western Cape Province highlighted).

Source: Wikimedia Commons

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The study was conducted in the Dysselsdorp informal settlement, which is situated approximately 25 kilometers east of Oudtshoorn town under the Eden District of the Western Cape Province, in South Africa. The settlement is essentially a dormitory town with its residents mainly making their living by supplying cheap labour to Oudtshoorn town and the surrounding farms. According to Friis-Hansen (2013), Dysselsdorp is characterized by high levels of poverty and has a long list of socio-economic problems such as high unemployment, low literacy levels, high teenage pregnancy rates, widespread alcohol and substance abuse, high school drop-out rates, inadequate services and high levels of illnesses such as tuberculosis.

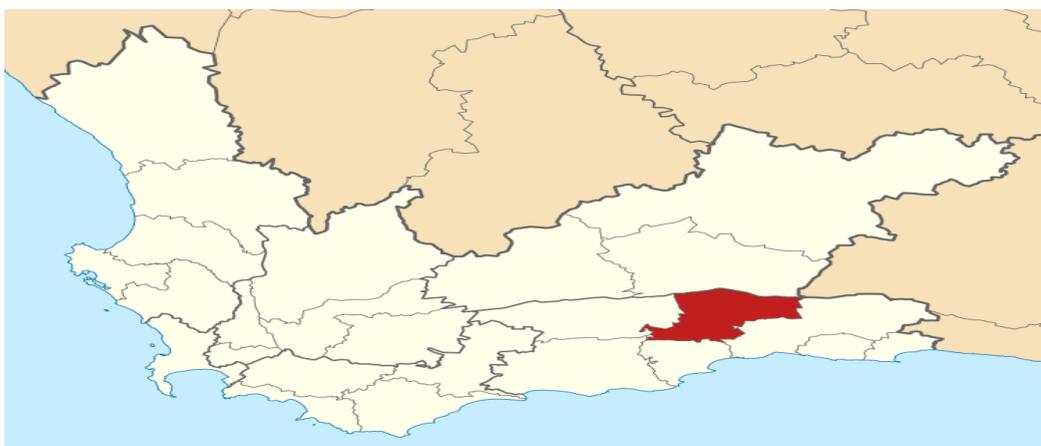


Figure 3.2. Map of the Western Cape (Oudtshoorn highlighted).

Source: Wikimedia Commons

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The study involved both male and female students registered for the PHFS, as well as five households selected to participate in the gardening activities and nutrition education. During the programme orientation, students identified and selected five households that had land available to grow vegetables and fruits. The students worked with these households on their home gardens.

3.3 Study design

The study used qualitative methods to gather information on household access to a variety of foods and to determine the practices used by the households to increase food accessibility. Qualitative methods are appropriate for assessing the effectiveness of any interventions and for evaluating the outcomes of the programme. The purpose of qualitative research is to recognize the meanings people give to their experiences and surroundings (Maxwell, 2013).

In this study, qualitative methods were used to examine the perspective of the participants and to determine whether the programme's implementation was effective in the households and in the community setting.

3.4 Sampling

Sampling is regarded as a plan of action used to select an element from the population (Dattalo, 2009). It is used as an efficient and cost-effective way to collect data that can reduce costs, as well as improve the quality of data (Freedman, 2004). The sample frame had 30 PHFS students selected from three groups and 100 households residing in the Dysselsdorp settlements. The groups are units in which the students are placed for the learning activity to take place (usually 50km radius) to the contact centre.

A stratified random sampling strategy was used to select the 30 students who participated in the focus group discussions. Dysselsdorp had three groups of students who attended the short learning programme. From each class, a group of 10 students was randomly selected using a class list. Stratified random sampling is a sampling process, which involves dividing the population into homogenous subgroups and taking a simple random sample in each of the two sub-groups (Davies & Hughes, 2014). Purposive sampling was used to select 100 households for the baseline interviews. These households were selected by the students as they resided in the same area. The students had three to four households which they were familiar with and whose homes were easily accessible to them to work within developing home gardens. Purposive sampling is a non-probability sampling technique that is selected based on the characteristics of the sampled population and the objectives of the study (Davies & Hughes, 2014).

3.5 Data collection

Data are regarded as recorded empirical observations on the cases which are under study and they can be gathered from various sources such as surveys, records, direct observations and historical documents (Freedman, 2004). Data were collected by the researcher with the assistance of 10 field workers from two types of populations, namely the households and the students from the PHFS. The researcher explained the objectives and protocol of the study to the participating students and households before data collection.

Table 3.1: Details of instruments used for data collection to achieve tabulated objectives

Objective	Instrument	Data variables	Outcomes
The student and household socio-demographic profile	Baseline questionnaire: socio-demographic section	Household size, education level, head of the household, number of children	Food security status of household and access to nutritious food.
Access to nutritious foods and diet diversity	Baseline questionnaire: 24-hour recall and Food Frequency recall, hunger scale and Household Dietary diversity score (HDDS) used to assess access to a diverse diet	Food from the 5 food groups, Presence of hunger in households.	Household's status in accessing to diverse nutritious, access to and utilization of resources
Practices for promoting food accessibility in terms of the food system	Focus groups discussion and interviews to assess production of food, selection of diverse food and diets	Agricultural production: plant and animal types, type of gardens	Production, selection of diverse food and diverse diets. Different types of practices used.
Challenges, weakness and strength affecting food security	Focus groups discussion and interviews.	Programmes strength, weaknesses and challenges.	Students and households experience and benefits.

3.5.1 The household food security baseline questionnaire

Data for this study were collected through individual face-to-face interviews conducted using a semi-structured baseline questionnaire for the households. The questionnaire consisted of five sections, namely the socio-demographic section, food utilization, food availability, food accessibility and the living standards/expenditure using the LSM scores.

3.5.2 Focus group discussions

The advantage of using focus groups discussions in research is that it ensures that the researcher retains a high degree of control over the topic while granting the participants full interaction within the discussion (Davies & Hughes, 2014). The researcher conducted the focus discussions using a list of key questions that guided the interviews. The focus group discussion procedure took place as follows:

- The sample of 30 students was gathered and divided into three groups to participate in the focus group discussion; The researcher was the facilitator.
- The researcher began by explaining the purpose of the discussion, the procedure, the rules and duration of the discussion. Issues surrounding the programme, for example, the challenges and success of the programme, were discussed. Information received during the focus group discussions was transcribed onto a questionnaire template

3.5.3 24-Hour food recall, Household Diet Diversity Scores and Food Frequency recall

The 24-hour recall measures the food intake of the household during the 24 hours immediately preceding the collection of data. A diet with a variety of foods is important, in order to ensure an adequate intake of essential nutrients (Thorne-lyman *et al.*, 2010). Households were asked to record what they had consumed the day before they were interviewed. The researcher later on recorded the food items on the 24-hour recall list. Besides the 24 hour recall, the researcher further probed to find out if any other foods (meals and snacks) and drinks had been consumed the day before. These foods included foods consumed both in and outside the home.

The HDDS is a qualitative method for food consumption, which reflects household access to a variety of foods. The diversity score consists of several food groups that the household would have consumed over the past 24-hours. The HDDS, adapted from FAO, was used by the researcher as an indicator guideline for food consumption to calculate the food items in the 24-hour recall list (see Table 3.2). The HDDS reflects household access to a variety of foods (FAO & EC/FAO, 2007). Swindale and Bilinsky (2006) indicate that questions on diet diversity should be asked at the household level, in order to examine food security in the household. Furthermore, household participants had to recall all the food items that they had consumed and the frequency with which the household consumed certain food items in the past seven days.

Table 3.2: Aggregation of food groups to create HDDS

Question number(s)	Food group
1	Cereals
2	White tubers and roots
3,4,5	VegeTables ¹
6,7	Fruits ²
8,9	Meat ³
10	Eggs
11	Fish and other seafood
12	Legumes, nuts and seeds
13	Milk and milk products
14	Oils and fats
15	Sweets
16	Spices, condiments and beverages

Source: (FAO & EC/FAO, 2007)

1: Vitamin A rich vegetables, tubers, dark green leafy vegetables and other vegetables.

2: Vitamin A rich fruits and other fruits.

3: Organ meat and flesh meat.

3.5.4 Field visit: pilot study

The study was piloted in Dysselsdorp settlement of Oudtshoorn District in the Western Cape. Fifty-one (51) households, which were randomly selected, interviewed. The questionnaire was discussed with the HFS promoters in its pilot phase to determine its suitability for use with the households and students. This was an important phase because the field workers were able to make comments or suggestions, especially considering that they knew the area well and spoke the same language as the people in the selected households. The pilot interviews were conducted using a semi-structured questionnaire to gather information on household composition, sources of income, coping behaviours, types of food consumed, food access and LSM scores.

Before research data collection commenced, two training sessions were organized. The first training involved field workers and during this training, the consent form and questionnaire were explained to the participants in detail. The second one was a set of meetings held the day before the actual data were collected. The process and any foreseeable possible challenges they may face were discussed. Data were gathered through face-to-face interviews conducted by the researcher and field workers. Information received during the interviews was transcribed into English onto the questionnaire template.

3.5.5 The Mid-term interviews

The researcher conducted the first household interviews with the assistance of field workers. The interviews were carried out mid-term when lectures were in session, and while some households were preparing their gardens for planting (other households had already planted a few crops).

3.5.6 The End-term interviews

The last interviews (end-term) were done at the end of the term with the same students and household participants at the end of the semester using the same data collection instruments. These interviews were conducted to identify any progress and further improvements made in the garden during the year.

3.6 Data analysis

Data analysis is the process of systematically searching and arranging the interview transcript, field notes and other accumulated materials to increase a person's understanding and to present the findings (Bogdan & Biklen, 1992). Qualitative data from the focus groups discussion and interviews were recorded, transcribed by the researcher. Data from the questionnaires were captured on the Microsoft Excel spreadsheet and imported into the Statistical Package for Social Sciences programme (IBM SPSS 24) for analysis. Notes from the focus group interviews were transcribed and organized into units based on the outline and information provided. The researcher looked at how all individuals responded to each question and the information was organized and grouped under each question from the outline. The themes and connections were used to explain the results and these were correlated with the objectives of the study. The information obtained from group discussions was interpreted together with the descriptive data collected during the study.

Descriptive statistics (frequencies, means and standard deviations) were determined and the LSM were analyzed on the Microsoft Excel spreadsheet according to the AMPS, SAARF'S DIY tool (2014). The total score (based on the weighted 29 variables) was used to create the ten LSM groups (LSM 1–10). The LSM 10 groups are often categorized into subgroups that

roughly represent the low-income group (LSM 1–4), middle-income group (LSM 5–7) and high-income group (LSM 8–10).

3.7 The significance of the study

The literature on food security is growing. This study was located within a framework of food security and household gardens. Achieving food security is a critical component of meeting the MDGs objectives, which aimed at halving poverty and reducing the number of people suffering from hunger by 2015. According to Modi *et al.* (2006), many studies have been done on food security and its measures which document the food security status of the population and households. The studies also highlight the importance of small scale-subsistence agriculture, as households depend on gardens which contribute significantly to their dietary needs.

Promoting food security in SA is a major challenge and this study seeks to identify issues that may be hindering the successful implementation of the programme, as well as identifying factors that can contribute to its success. Food security is important for nutrition, for the health of the population and for growing the economy of the country. It is, thus, important to study the targeted households and communities. Students were trained to become facilitators, in order to promote food security and reduce the incidence of hunger in their communities.

When the household food security programme is properly implemented, it can improve food security awareness and nutrition behaviour of the households and targeted communities. However, there is no literature to support the effectiveness of the programme, and studies

should be done before and after the implementation of the programme. A thorough understanding of its effectiveness will have a major effect on further development of sustainable programmes aimed at promoting food security, nutritional status and eradicating poverty among targeted populations.

This study seeks to contribute to sustainable and improved living conditions of individuals, households and communities, as well as encourage economic growth in the country. The end result will be used to monitor and evaluate the process to determine whether the qualification is meaningful enough to sustain student and household livelihoods. Any issues hindering the successful implementation of the programme will be identified and addressed and recommendations made for the development of the programme.

3.8 Ethical considerations

The research proposal was submitted to the Department of Life and Consumer Sciences in the College of Agriculture and Environmental Sciences for ethical clearance. Since the data collection procedure involved students and household individuals, the proposal was vetted and approved before data were collected. The purpose and importance of the study, as well as the study objectives, were explained to all participants. They were also made aware of their rights with regard to their participation in the study. The participants were given the opportunity not to participate in the study if they wished not to. They were given two consent forms to sign. The information received from the participants was kept strictly confidential, the questionnaires were coded and names and contact details were not used in order to ensure the privacy of the participants.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Introduction

The aim of the study was to investigate access and practices which lead to an increase in household access to nutritious food through participation in the PHFS short learning programme offered by the University of South Africa. Specific objectives were to determine the socio-demographic profile of participating households; to determine household access to nutritious food, and a diverse diet, and to determine practices used to promote diversity in the household diet in terms of food systems. The study also sought to identify factors (challenges, strength and weaknesses) as perceived by the students.

South Africa is a food secure country, which produces sufficient or nearly sufficient staple foods. It has a capacity to import food when the need arises and it is able to meet the basic nutritional requirements of its population. However, currently, affordability and availability of nutritious food to the population have become a growing cause for concern (du Toit *et al.*, 2011). Even though the country is deemed food secure, there are still households which are food insecure. Machete *et al.* (2004) report that household food insecurity is prevalent in rural areas. The report states that the majority of those food insecure households comprised of poor people with roughly 75% found in the rural areas. The South African government introduced strategies, such as social grants, to fight against food access problems (Koch, 2011). To date, these strategies have not yielded considerable results because most grant recipients do not complement the grant with their own food production (Musemwa *et al.*, 2015). Households with insufficient food or lack of resources to buy food are unable to grow

sufficient food and may experience hunger. Food production should be promoted among households with access to land. This will help improve access to food and at the same time generate income for the household.

Socio-demographic data of this study provide background information on the targeted households. In addition to the socio-economic status information, the respondents provided information about how they access food, the types of food they consume, as well as how often they skip meals due to insufficient food in the household.

4.2 Socio-demographic data

Socio-demographic data provide background information on the sampled households in Dysseisdorp settlement. The socio-demographic status of the households plays an important role in determining the factors that may influence a household's access to food.

4.2.1 The age distribution of respondents

The respondents' ages are arranged into five different categories, as shown in Figure 4.1 below. The results indicate that the largest (30%) group was made up of participants who were over 60 years. This was followed by the group aged between 41 and 50 (25%), and between 51 and 60 represented 24%, while, those aged between 31 and 40 (17%) of the sample. The lowest age groups were made up of the 21 to 30 age group (2%) and those who did not disclose their ages (2%). The results clearly indicate that the majority of the respondents were old; A high number of adults above 50 years of age participated in the study. This finding corresponds with the findings of Oldewage-Theron and Kruger (2009)

who discovered that, in developing countries, older populations are increasingly forming a significant part of the total population. This means that older people dominate the households, possibly, playing a significant role in households and community.

The high number of older people could be attributed to the fact that younger people in rural areas are always moving to towns and urban areas in search of better employment opportunities and improved service delivery (Muhwava *et al.*, 2010). The age of the household head can be used to determine farming experience in that household. This is because the older the members of the household the more experienced and the more aware of issues pertaining to food security. Studies confirm that households with an older member are able to acquire more farming experience and that they produce a diversity of food crops (Bogale & Shimelis, 2009; Mitiku *et al.*, 2012). However, as the older members of the households contribute to farming information on plants and crops, they cannot participate in the farming activities and rely on others for assistance.

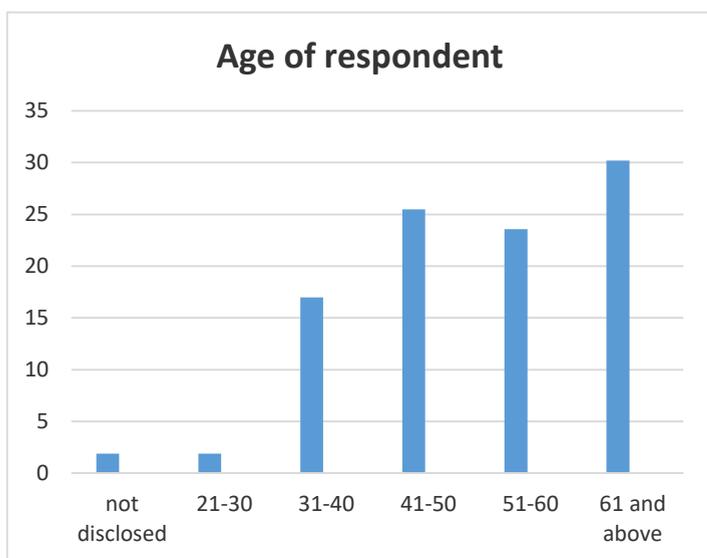


Figure 4.1 The age distribution of respondents

4.2.2 Distribution of household size

Table 4.1. presents the distribution of the household size of the 100 participants from Dysseisdorp settlement in the Western Cape. Five hundred and forty (540) people resided in the households that participated in the study. The households comprised of 294 women (average 2.83 per household) and 246 males (average 2.37). Household size ranged from one to 15 members with a mean of 5.2. The 2016 Community Survey (CS) indicated that the average household size in the Western Cape Province is 3.2. Thus, compared to the survey, the results of this study show an increase in household size (Statistics South Africa 2016a). The number of females per household was higher than that of males. The results concur with the recent mid-year population estimates, which showed that just over 51% of the total population were females, while the males made up 49% (Statistics South Africa 2017). The average household size is 5.2; this indicates that the participating households have mainly nuclear families.

The household size is an important demographic factor, which is positively related to household food security status (Baiyegunhi & Makwangudze, 2013). A larger household means that there is more pressure to meet the food requirements as compared to a smaller household. Household size represents the consumption needs of a household and shows the burden it faces to feed its members. Hence large households are more likely to be food insecure compared to households with smaller family sizes. (Bogale & Shimelis 2009; Gebre, 2012; Mitiku *et al.*, 2012). Mitiku *et al.* (2013) explain that the amount of food required for consumption increases with household size.

Table 4.1: Frequency distribution and average household size of the sampled 100 households in Dysseisdorp

Household members residing from the participating households	Total number of residents from the participating households	Average number of members in the participating households
<i>Total number of females</i>	294	2.83
<i>Total number of males</i>	246	2.37
Total number of Household members	540	5.2

4.2.1 The education level of respondents

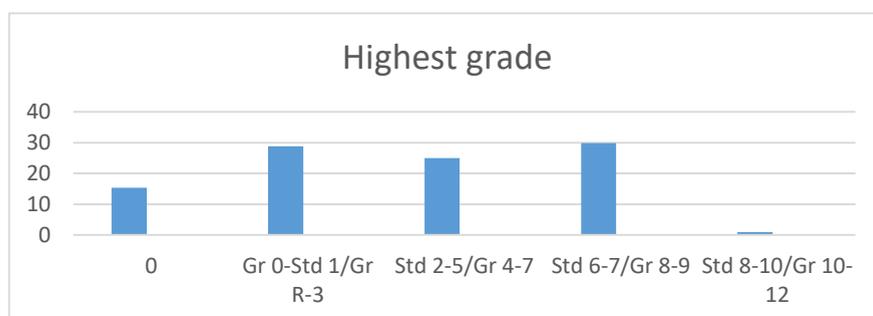


Figure 4.2 The highest level of education of the household head

Figure 4.2 indicates the educational levels of the heads of households who participated in the study. The educational levels of the participants were categorized as follows: grade 0 (no schooling) to grade 3, grade 4-7; grade 8-9, grade 10-12, advanced certificate, diploma,

degree, and other Higher Education qualifications. The category with the highest number of participants was the grade 8 to 9 group with 30%, followed by grade 1-3 (29%), grade 4-7 (25%), and grade 10-12 (1%); 15% indicated that they had no schooling.

The percentage of household heads with secondary level schooling was higher than those who had completed primary schooling. This could be because Dysselsdorp settlement has government schools within walking distance and all its residents have opportunities to attend primary schooling. Judging by the results, many heads of households were able to read and write. The majority of participants had not attended further education and training as only 1% reached college level. This finding is consistent with the results from Stats SA, which reported an increase in the number of people receiving formal education in South Africa (Statistics South Africa, 2016c). Furthermore, the 2015 General Household Survey report revealed an increase from 22% in 2002 to 28% in 2015 in the percentage of individuals 20 years and older who had attained Grade 12 (Statistics South Africa, 2016b). The high levels of education of the participants is a positive attribute which can positively affect the achievement of household food security. The percentage of individuals without schooling was higher compared to a reported decrease from 11% to 5% in individuals over the age of 60 years (Statistics South Africa, 2016b).

All South African citizens have a right to basic education and that is enshrined in the South African Bill of Rights (Statistics South Africa, 2016b). Mutisya *et al.* (2016) suggested that education, irrespective of household wealth status, has an independent effect on food security; it influences household decisions, resource allocation and access, which, in turn, determine household food security status.

Education is a key factor in food access, production and utilization. Moreover, education is associated with better employment opportunities and can provide households with knowledge on how to meet their health and nutritional needs (Bashir & Schilizzi, 2013; Gebre, 2012). These opportunities, such as better employment, provided by education, imply increased disposable incomes for households (Mutisya *et al.* 2016). Given this, household heads with higher levels of education are more likely to be food secure because of their increased purchasing power (Bashir & Schilizzi, 2013). However, the literacy levels of participating households in the study area was low and this can be a constraint in improving agricultural practices. The level of educational attainment is an important attribute for household heads, who are normally the decision makers; this attribute has a positive effect on food security (Makombe *et al.*, 2010; Idrisa *et al.*, 2008). This could be attributed to the fact that education influences the livelihoods of households, meaning that the higher the individual's education, the better and higher their incomes and the more purchasing power to buy food and necessary resources required in their families (Baiyegunhi & Makwangudze, 2013).

4.2.2 Number of years residing in Settlement

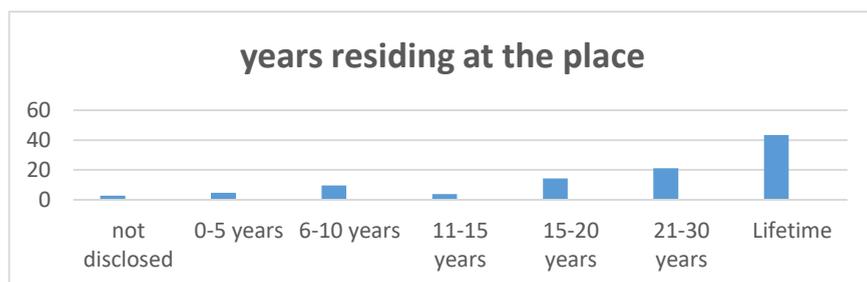


Figure 4.3 Distribution of years residing in Settlement

Figure 4.3 indicates the average number of years participants have lived in Dysselsdorp. Approximately 43% of respondents have lived in Dysselsdorp for over 30 years, 21% lived in the area between 21-30 years and 21% have lived in the area for less than 15 years. The results indicate that a large number of households have resided in Dysselsdorp settlement for over 20 years. The settlement is communal land and families may have lived there for generations. The number of years families have resided in the area may also be a result of the fact that their families, friends and relatives also stay in the area, meaning that they have close relationships with their neighbours. Residents of this settlement are allocated land that is big enough to build a house and to do farming in the communal land.

The amount of time or years taken by the household to stay in the area is an indirect measure of how they are coping. A household, which stays longer in one area, has more experience in dealing with challenges that they face because they have built some form of support and connections in the community which they can use to negotiate when faced with challenges such as being food insecure. The results are supported by Martin *et al.* (2004) who did a study on food security. The study revealed that social networks provide strong support for households.

In conclusion, socio-demographic factors, such as the age, family size, gender composition, resources available and educational levels, have an influence on the food security status of the household. Family size may influence the food security status of the household, especially with regards to food availability and distribution among the members.

4.3 Household activities

4.3.1. Food preparation

Figure 4.4 reveals that the majority of the respondents (83-89%) are female heads who are responsible for preparing food in the household, followed by the girl child (11-9%), male heads (6-4%) and the male child (1%). The results show that females are mostly responsible for meal preparation in the households and that men are minimally involved. Allen and Sachs (2007) also found out that women in rural and urban settlements are responsible for food preparation in their households.

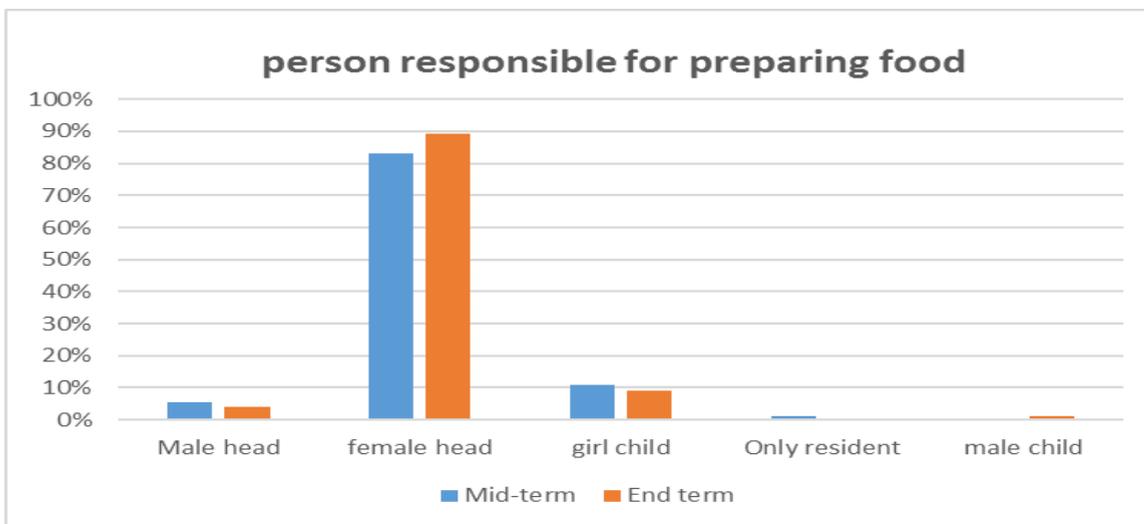


Figure 4.4 Distribution of the household members responsible for preparing food

4.3.2. Food purchasing

The majority who were responsible for purchasing food in the household were female heads (81-89%), followed by the girl child (7-6%), male heads (8-6%) (see Figure 4.5). This indicates that more females in the households are responsible for food-related activities. This may imply that women are responsible for providing food for their households and that they determine the type of food, quality and quantity to prepare for all the members of the household.

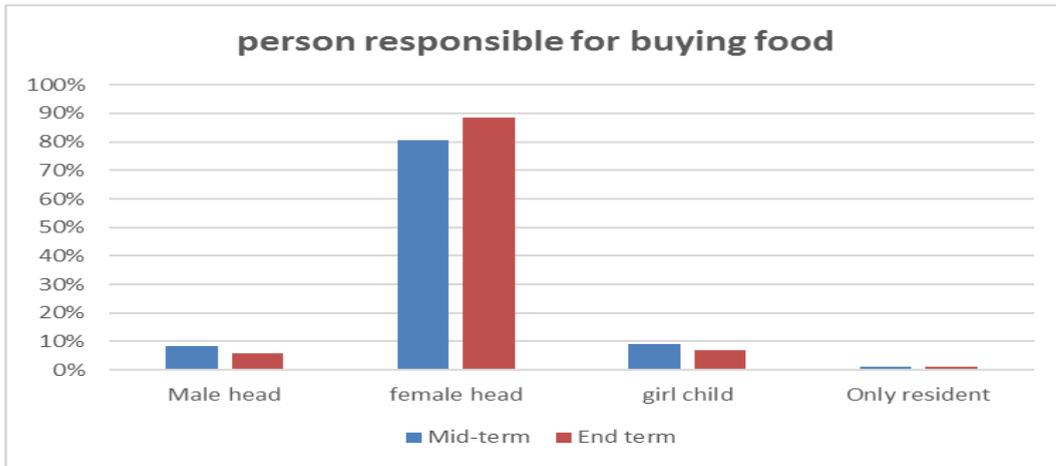


Figure 4.5 The distribution of household members responsible for buying food

4.3.3. Home gardening activities

The results indicate that the gardening activities are shared among all the members of the household (see Figure 4.6). Men were mostly responsible for working in the garden (46-44%), followed by female heads (30-40%), the male child (10-12%), garden workers (4-6%) and the girl child (4-5%). In addition, households with older people had garden workers to assist them with the garden activities because they found it difficult to do the work themselves.

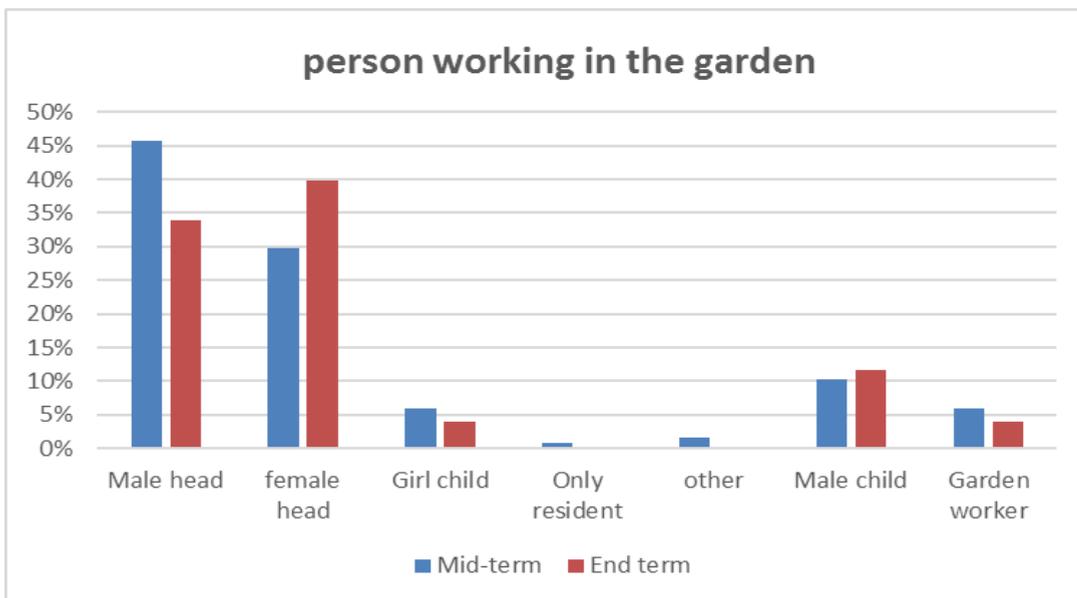


Figure 4.6 Distribution of household members working in the garden

Usually, household activities are shared among members. However, females rank higher in food purchasing and food preparation activities than males. The results are confirmed by the focus group discussions, which noted that women and older people are responsible for most of the household chores and that men only contribute by working in the garden. The results confirm that females are more involved in food preparation and purchasing activities than males (Bellows *et al.*, 2010). The results indicate that there is a higher number of females in the households responsible for all the activities pertaining to food. This may imply that women are responsible for providing food for their households and for determining the type of food, quality and quantity to prepare for the family. According to Trefry *et al.* (2014), women play an important role in shaping the cultural practices and norms surrounding food not only in the manner in which it is cultivated but also in its harvest, preparation and serving.

Kehler (2001) states that women in the rural areas of South Africa play a significant role in agriculture as food producers than men. Trefry *et al.* (2014) also observed that women are key players in food security and that their role in food production has increased. Bhandari (2017) supports that women in developing countries who are involved in gardening or agricultural activities tend to have a positive impact on the agricultural labour force and food security. Nigussie *et al.* (2014) note that women in both male-headed and female-headed households were responsible for almost all the household chores. In addition, women spend most of their time doing these activities since they have little help from other family members.

4.4 Food groups and dietary diversity

This section focuses on food groups and beverages based on the 24-hour dietary recall, Household Dietary Diversity Score and the 7-days food frequency given by participants of the study.

4.4.1 Food groups consumed in 24-hours

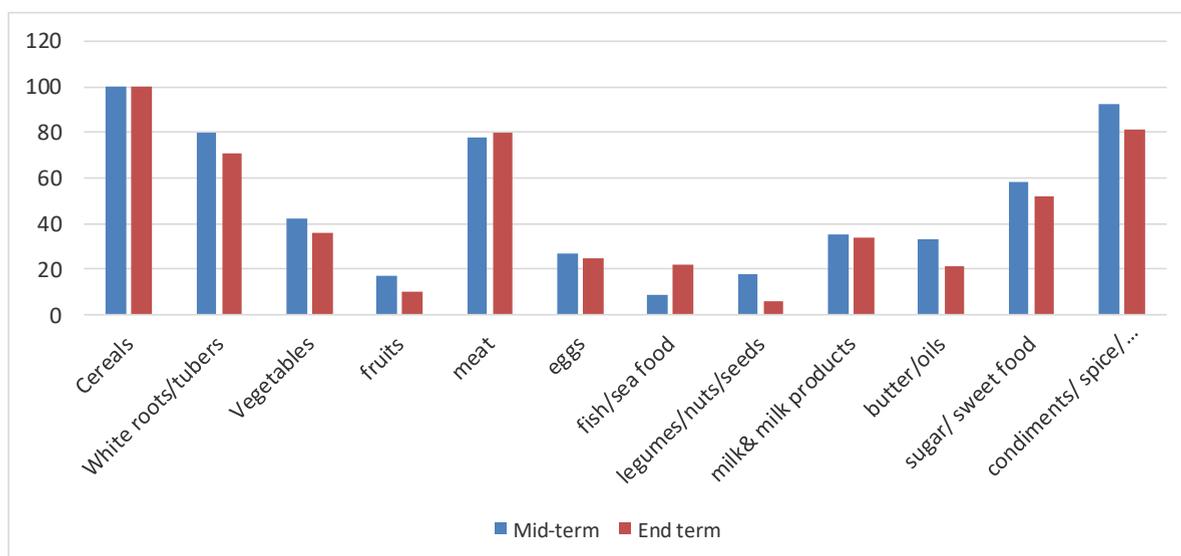


Figure 4.7 Summary of the reported 12 food groups consumed in the 24-hours recall by the participating households

Figure 4.7 indicates that food diversity in the 24 hours food recall was similar but slightly decreased among the households from mid-term to end-term. However, the distribution of food from the food recall suggests that household's diets are mainly high in cereals, condiments, meat, roots/tubers and sugar. Households consumed fewer vegetables, fruits, milk and milk products, butter, eggs and fish products. This distribution of food in the household diets shows a lack of variety of nutrients that are important for a healthy diet. In developing countries, among the poor people, lack of dietary diversity is a serious problem because the diets of the poor usually comprise of starchy staple foods, little or no animal products and a few fresh fruits and vegetables (Ruel, 2002).

The distribution of the food and beverages in the participating households of Dysselsdorp suggests that, on average, food groups rich in cereals, white tubers, condiments and meat are consumed at the expense of milk, eggs, fish, fruits and vegetables. The results of this study are consistent with those of Bvenura and Afolayan (2015) who argue that South African diets are mainly based on cereals and, therefore, lack energy and nutrient density. The South African FBDGs recommend that vegetables, fruits, meat, fish, milk or eggs should be consumed daily (Vorster *et al.*, 2013).

4.4.2 Household Dietary Diversity Score from the 24-hour recall

Table 4.2: Percentage of the HDDS ranges of household respondents

HDDS total	Mid-term	End term
1	1	0
3	7	2
4	12	8
5	32	22
6	25	23
7	11	20
8	9	16
9	2	8
10	1	2

The Households Dietary Diversity Score (HDDS) refers to a qualitative method for food consumption, which reflects household access to a variety of foods (FAO & EC/FAO, 2007). The diversity score consists of 12 food groups that the household consumed in the last 24-hours. The HDDS is calculated based on the 12 food groups as proposed by FANTA (Swindale & Bilinsky, 2006). The consumed food groups are summed up and the mean score is used to determine diet diversity. HDDS which is below four is considered food insecure and a score between 5 and 12 is considered to be food secure. Steyn *et al.* (2006) suggest that a household with a dietary diversity score above four is a good indicator of diet

quality. This implies that the diets of households with an HDDS below five lack diversity, and this may result in micronutrient deficiency. These households are vulnerable to food insecurity. Labadarios *et al.* (2011) argue that a household with a higher score tends to be food secure as opposed to one with a lower HDDS.

The finding in this study is that the average HDDS increased from 5.6 to 6.4, with a standard deviation of 1.5, which is above the recommended cut-off point for dietary quality (Steyn *et al.*, 2006). Up to 31% of the households had HDDS below the mean of four, while 69% were above the mean of five. Households with HDDS of 5 and above are considered food secure since the higher the HDDS means that the households have more food from the different food groups in their diet (Labadarios *et al.*, 2009).

The results of this study show households have access to food, indicating that, on average, from the 12 groups, the households consumed 6 different food groups. This indicates that those households are food secure and are able to fight against hunger. Households with an increased consumption of food from different food groups in their diets show that they have improved access to food (Swindale & Bilinsky, 2006). This finding indicates that households participating in this study are able to access and consume a variety of food groups through either growing their own fruits and vegetables, keeping livestock and purchasing food from the shops.

4.4.3 Food consumed in the past 7 days (one week)

Table 4.3: Consumption patterns of different food items of the 7-days food recall

FOOD GROUPS	7 days food recall	Mid-term	End term
CEREALS	Bread	86	88
	Cereals	16	16
	Porridge	44	37
	Pasta	45	48
	Rice	89	88
	Mealies/corn	13	5
VEGETABLES	Spinach	3	0
	Pumpkin	28	38
	Beetroot	16	13
	Carrots	34	38
	Tomatoes	13	32
	Onions	24	35
	Potatoes	90	87
	Cabbage	32	39
	Beans/peas/lentils	46	31
	Cucumber	1	1
	Broccoli	1	1
	Sweet potatoes	12	7
	Soup	15	5
	Lettuce	2	0
	Celery	1	0
FRUITS	Banana	3	0
	Apple	5	1
	Lemon / orange	3	0
	Pastry foods	5	4
FISH	Fish	35	47
MEAT	Beef	43	32
	Chicken	66	67
	Sausage meat	27	40
	Ostrich meat	8	15
	Lamb meat	8	12
	Livers organ meat	10	13
	Pork	1	9
EGGS	Eggs	16	35
MILK & MILK PRODUCTS	Milk	19	21
	Yoghurt	2	0
	Cheese	1	9
BUTTER/OILS	Butter	7	17
SUGAR & SWEET PRODUCTS	Sugar	21	34
	Soft drinks	6	21
CONDIMENTS	Spice	2	11
	Salt	6	8
	Coffee	49	52
	Tea	40	43

Table 4.3 clearly indicates most of the food products that were consumed in the 7 days of food recall. Potatoes were consumed the most, followed by rice, bread, chicken, pasta, porridge, lentils, beef, coffee, tea, beans and fish. The results show that all the households consume cereals as part of their diet. The types of cereals consumed were mainly bread, rice, pasta and porridge because they were easily accessible. In most rural areas in developing countries, the poor populations consume large amounts of staple foods as part of their diet. The high consumption of cereals could be put down to the fact that they are affordable and easy to grow. Labadarios *et al.* (2011) found that the most consumed food groups in South Africa were cereals/roots, meat, fish, dairy and vegetables (other than vitamin A rich food sources).

It is noted that there is a high percentage of households who consumed tubers and roots, beans and onions. This could be due to the fact that those households grow their own and they have access to these foods through own production. The respondents from the focus group discussions mentioned that the commonest meals consumed in the area are rice and potatoes, hence the high consumption of these cereals. Pulses (beans, lentils and peas) are a good source of quality protein, and they are low in fat and rich in dietary fibre (Venter & Vorster, 2013).

The majority of the households (97%) did not consume spinach or leafy green vegetables; However, the consumption of vegetables, such as carrots, cabbage, onion and pumpkin was high. The reason for the low consumption of these vegetables may be due to low rainfall during the period when this study was done. These vegetables are commonly grown and consumed in South Africa, making them easily available in the diet of almost all the

households. The finding of the high consumption of onions, carrots, tomatoes and cabbage is consistent with those from Ruel *et al.* (2004) who found that these vegetables are common in sub-Saharan Africa. These vegetables are usually consumed with the staple food (rich in carbohydrates) or used as soups or gravy in meals (Smith & Eyzaguirre, 2007).

This finding is similar that of a study done by the South African National Health and Nutrition Examination Survey (SANHANES-1) which revealed a low intake of fruits and vegetables (two or fewer portions per day) in most households (Ronquest-Ross *et al.*, 2015). Vegetables, particularly those rich in b-carotene were reflected by data from the South African National Food Consumption survey, which showed that carrots and green leafy vegetables are important in a household's diet (Steyn *et al.*, 2006). Therefore, in order to achieve a higher vegetable intake, frequent consumption of vegetables should be promoted; however, this will vary depending on the season of the year (Faber *et al.*, 2013).

Fruits were the least consumed food group in the reported household's diet. However, fruits which were frequently consumed by the households included apples (5), oranges (3), bananas (3) and watermelons (1). The low consumption of fruits could imply that the fruits were off-season and that households could not access them; they might have had to wait for them to ripen. However, during harvest season fruits are consumed in large quantities because they are available. It is very clear that the majority of households did not include fruits in their diets and this may imply that a significant number of households are not getting the important nutrients that are contained in fruits. Labadarios *et al.* (2011) argue that the South African diet typically lacks variety, thus, an increased consumption of vegetables and fruits should be promoted to address this situation. The South African department of health

encourages South Africans to consume five portions of fruit and vegetables daily (Faber *et al.*, 2013).

Over 60% of the households consumed protein of animal origin. The chicken was the most consumed meat (66), followed by beef (43), fish (35), organ meat (livers) (10), lamb meat (8), ostrich meat (8) and consumed pork (1). The results show that the households included animal protein in their diets, which they either bought from supermarkets in town and local shops or obtained from the livestock that they keep.

Fish was reported to be one of the least consumed foods in the households. The most common form of fish consumed was canned fish (over 35%). This could be because canned fish is easily accessible from the local spaza shops and that it is cheaper than fresh fish, which requires one to travel to the nearest town to buy. Fish is a good source of protein, micronutrients and it is low in fat. However, its consumption in sub-Saharan Africa is reported to be declining in all regions (Béné & Heck, 2005).

The results show that households which consumed milk increased from 19% to 21% of households. The same consumption patterns for eggs was noted; households which consumed eggs increased from 16% to 35%. Even though there is a slight increase in the consumption rate, the intake of eggs and milk remains low in this study area. The low consumption of eggs and milk products may be due to eggs being expensive to purchase. According to Stats SA, in 2016, there was an increase in the cost of eggs compared to 2015 (South African Poultry Association, 2016). In addition, both eggs and milk require storage in refrigerators and some of the households do not have access to these. The low production of

livestock such as chicken and cattle can be another factor that results in low consumption of eggs and milk. Households are not producing their own livestock which they can use as a food source and they are unable to get egg and milk products from chickens and cattle because they do not keep any. In addition, the low consumption of milk could be attributed to the fact that sour milk is not commonly consumed in the coloured tradition.

Consumption of butter/oils, spices, salt and sugar is low. Cooking oil was used in small amounts during food preparation and caffeine was moderately consumed by half of the participating households. Consumption of food low in fat and fat products are recommended for all populations and throughout the life cycle (children and adults). The results confirm that the households in the area practice low intake of salt and oils; this is recommended by the South African FBDGs which advises that fats and salt should be eaten sparingly (Vorster *et al.*, 2013). According to Steyn *et al.* (2003), sugar intake was low in adolescents, adults, and children above 10 years of age with 6% consumption in the rural areas and 12% consumption from the urban areas.

Basic foods were mostly available in the households; this may be due to the fact that they are affordable compared to other food types. The following food groups were recorded in all households: starchy food, sugar, salt, fats/oils, vegetables and protein foods. However, milk and fruits were scarce in all the households. Low milk consumption could possibly be due to that most households did not have livestock where they can get milk directly from the cattle or lacked money to purchase the milk. The low consumption of fruits in most households results could be due to low production, that they are expensive to purchase and they are mostly off-season. Households require a variety of foods from different food groups, in order

to achieve access to a diverse diet for its members. Any lack of variety may result in the poor nutritional status of its members and food insecurity. Households had access to food from all food groups, with fruits being the least consumed. Households may be able to access and consume certain food groups from the food grown in their own gardens.

4.4.4 Food distribution in the household

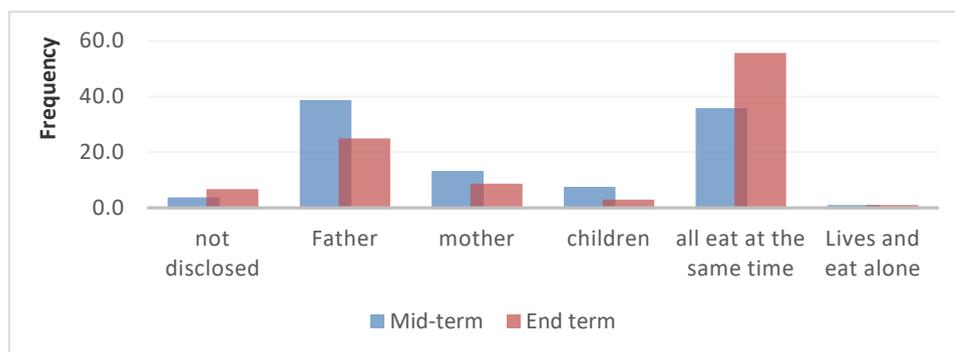


Figure 4.8 Distribution of who eat first in the household

The results for mid-term and end-term on distribution of food within the household indicate that, in most households, all members shared their meals at the same time (36-56%), followed by the following members being the first to be served; Men (39-25%), women (13-9%) and children (8-3%) (Figure 4.8). The respondents added that children eat at school during the day; they usually benefit from the NSNP. As a result, households only get to share meals with them only at supper time during the week. According to Osman (2015), parents always ensure that their children are present at school so that they could receive a meal in the school. This, in turn, improves school enrolment and attendance. Malongane *et al.* (2017) also argue that children who attend school receive school meals daily.

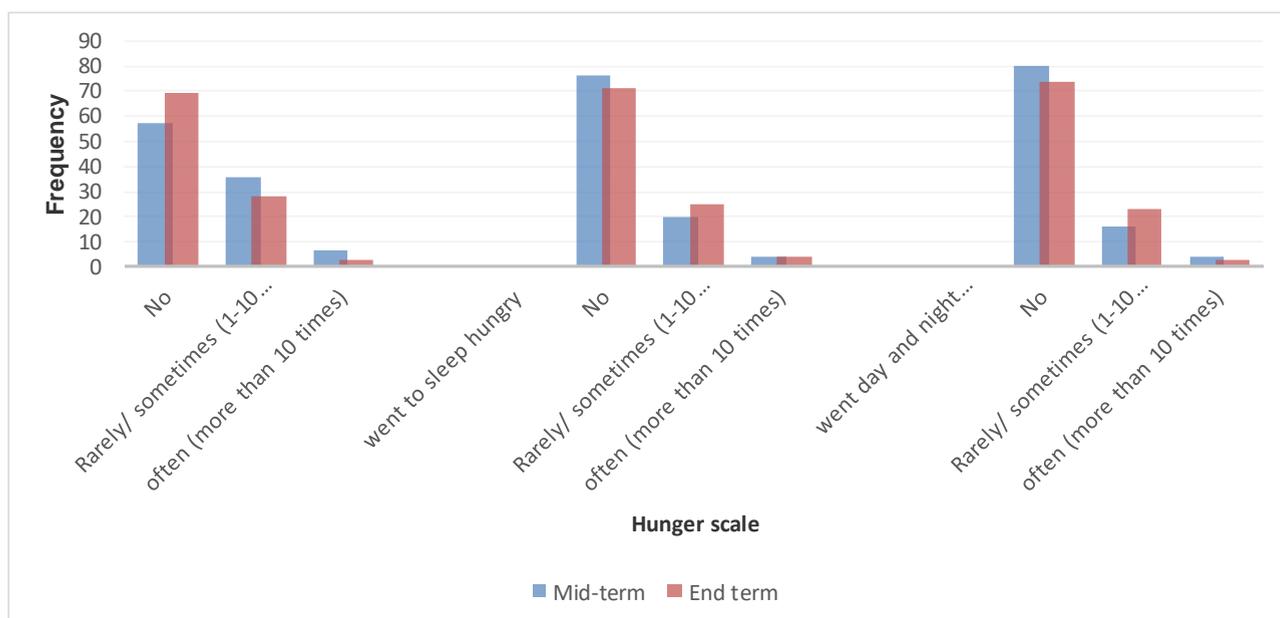


Figure 4.9 The frequency hunger scale

Figure 4.9 shows that almost all the participating households had access to basic food that could sustain them and protect them from hunger. The proportion of households that encountered the problem of spending a whole day and night without food decreased by one (from four to three) from mid-term to end-term. Households who often went to sleep hungry because there was not enough food was four. In addition, there was a decrease (from seven to three) in households where there was no food of any kind due to lack of resources or insufficient money to purchase food.

The results are consistent with those of the General Household Survey (GHS) South Africa, which indicated that the percentage of households vulnerable to hunger declined between 2002 and 2015 (Statistics South Africa, 2016b). The results of this study indicate that the proportion of households, which have experienced hunger and slept without food, slightly decreased at end-term and the majority of the households had no problems of food shortage. The results of this study thus confirm that food insecurity still persists in SA even though the

number of people who are vulnerable to hunger is declining in the country (Statistics South Africa, 2015).

4.4.5 Food consumption coping strategies used in times of food shortages

The different Coping Strategy Index tool (CSI) was recorded and used to determine how the households deal with food shortages. Figure 4.10 shows the coping strategies that the households used when food was insufficient. All the households rely on a variety of coping strategies, in order to feed their families when food is insufficient. These include asking for help from family or neighbours (36), depending on charity/grants (33), finding other sources of food (23), collecting wild food (17), finding additional sources of income (5), relocating to live somewhere else (4), exchanging assets (3), working for payment or food (3) and borrowing money to buy food (1). The results confirm that household food insecurity is prevalent in this rural settlement as households attest to employing various coping strategies.

According to Kruger *et al.* (2008), the most used strategies by the households are; seeking assistance from family or neighbours, charity, and relying on other sources of income to provide food. Households which tend to use various coping strategies to fight against food shortages may be considered food insecure. Some of these coping strategies that households rely on are short term, while others are even destructive to their livelihoods in the long term (Maxwell *et al.*, 2003). The food insecure households can attempt to increase their food supplies using short-term strategies that are not sustainable over a long period of time, for example, borrowing food, or purchasing on credit, asking for food, and consuming wild foods. These coping strategies cannot sustain a household for a long period. Other factors

that play a major role in determining the kind of types of strategies that households rely on to address food access are cultural practices and beliefs (Maxwell & Caldwell, 2008).

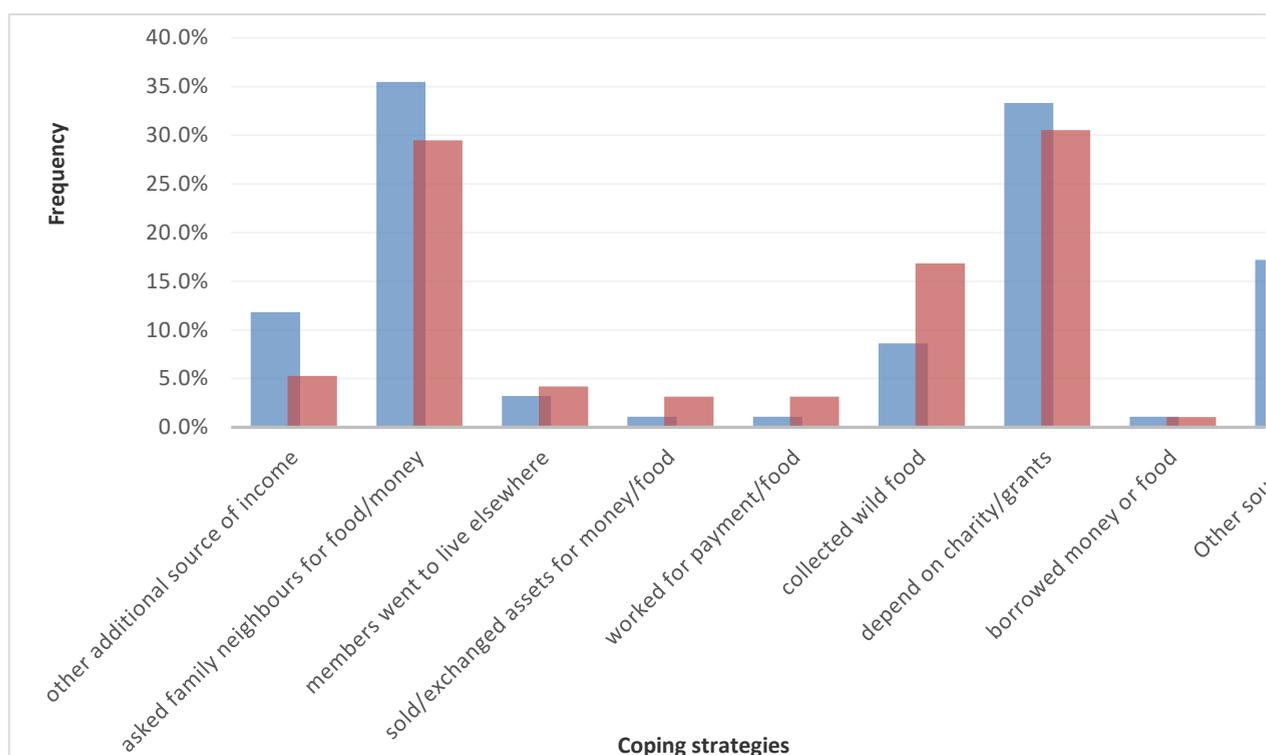


Figure 4.10 The frequency of utilization of the food consumption coping strategies

4.5 Agricultural production in the home garden

When households were asked if the crops they produced were adequate enough to last the whole year, half of them indicated that they do not produce enough crops (fruits and vegetables) for the whole year, while 50% produced enough. The responses of the participants indicated that crops lasted for a few weeks (21), a few months (29), half a year (9) and full year (4). The reasons for not producing enough crops varied as follows: do not have enough land in the garden (66), insufficient water (34), insufficient seeds (70), lack of

manure or compost (3), lack of fertilizers or pesticides (7), lack of tools or equipment required to do the gardening (11), and lastly, due to illness or age (3).

Almost all the households in this study area had access to land where they built their houses and the same land was used to make home gardens. All the households practised home gardening activities; they grew their own fruits, vegetables and crops. According to Taruvinga *et al.* (2013), households with access to a home garden are positively linked to increased dietary diversity. Food production in many developing countries, including in South Africa, remains largely small scale. Food production is mostly practised in rural settlements and it results in the reduction of labour and skills and, in turn, reduces production of food.

Most households that engage in their own food production are food insecure, and the main reason for being involved in own food production is to sustain their livelihoods (Altman *et al.*, 2009). Every household is encouraged to produce some food for household consumption with the long-term goal of producing enough food to sell at local markets (Food and Agriculture Organization, 2006). Access to a home garden can contribute positively to increased dietary diversification. Home gardens normally provide the household with a variety of fruits, vegetables and crops. Bouis (2007) suggested that a positive correlation exists between home food production and improved nutrition.

4.5.1 Vegetables produced in the household garden

All households in this study grew different types of vegetables in their home gardens. Of these households, 72% were fenced, while 28% were not. All households had access to vegetables from their own home gardens. Figure 4.11 presents the vegetables that were

produced in household gardens. These included beetroot, carrots, cabbage, pumpkin, green beans, spinach, dried beans, chillies, green peppers, lettuce and sunflower.

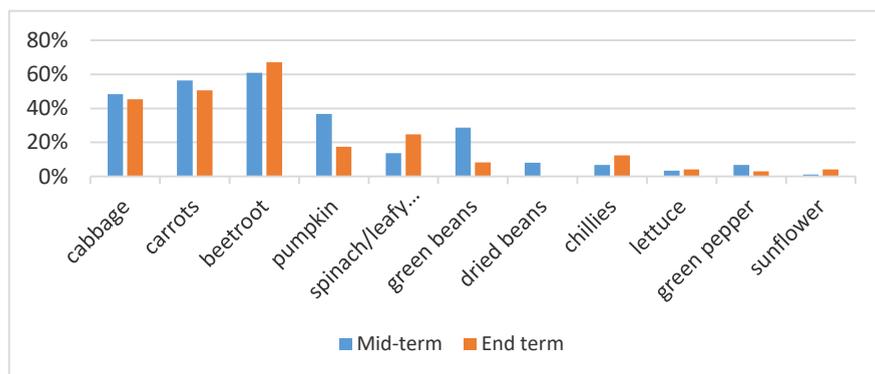


Figure 4.11 Types of vegetables produced in the garden.

4.5.2 Traditional, wild plants and herbs produced in the home garden

The number of households which grew traditional or wild plants decreased from 55% in the mid-term to 41% in the end-term. This could be because the plants were off-season during the end term period, hence, there was a reduction in the number of households which were growing them. The focus groups interviews revealed that the traditional plants were used as herbs, spices and as medicines. The consumption of indigenous crops was moderate, and this could potentially improve the household micronutrient intake (Modi *et al.*, 2006).

Indigenous plants mostly occur naturally in any area. Although a variety of indigenous plants may be locally available, only a few selected ones are used for consumption. Indigenous plants are rich in nutrients and, yet, many people do not consider them as sources of food or nutrients. The cultivation of wild vegetables in South Africa could be used to address the problem of food insecurity (Bvenura & Afolayan, 2015). Production of traditional or

indigenous plants is done on a small scale in rural areas and these plants are only produced under certain weather conditions throughout the year (Department of Agriculture Forestry and Fisheries, 2009).

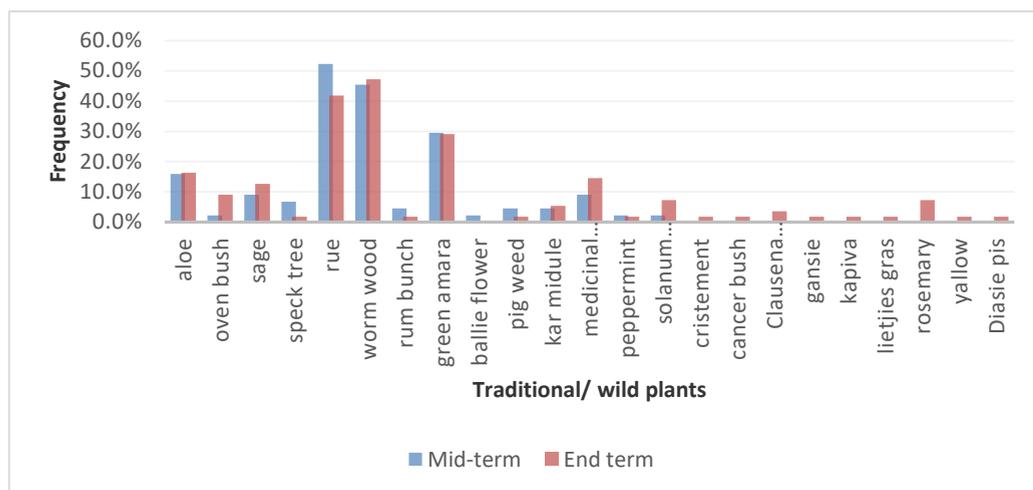


Figure 4.12 Traditional, wild food & herbs produced in the household gardens.

4.5.3 Crops and herb plants produced in the home garden

Crop production increased from 58% (mid-term) to 83% (end-term). The crops and vegetables that were planted during both terms of the study were onions, potatoes, maize, sweet potatoes and tomatoes, garlic and parsley. Crop production means that households are involved in other means of ensuring greater food availability and security for their families. Mutisya *et al.* (2016) reported that households which grow crops for household consumption are significantly more likely to be food secure or moderately food insecure. Livestock, fruits, vegetables and crop production in South Africa make significant contributions to rural livelihoods (Shackleton, 2001).

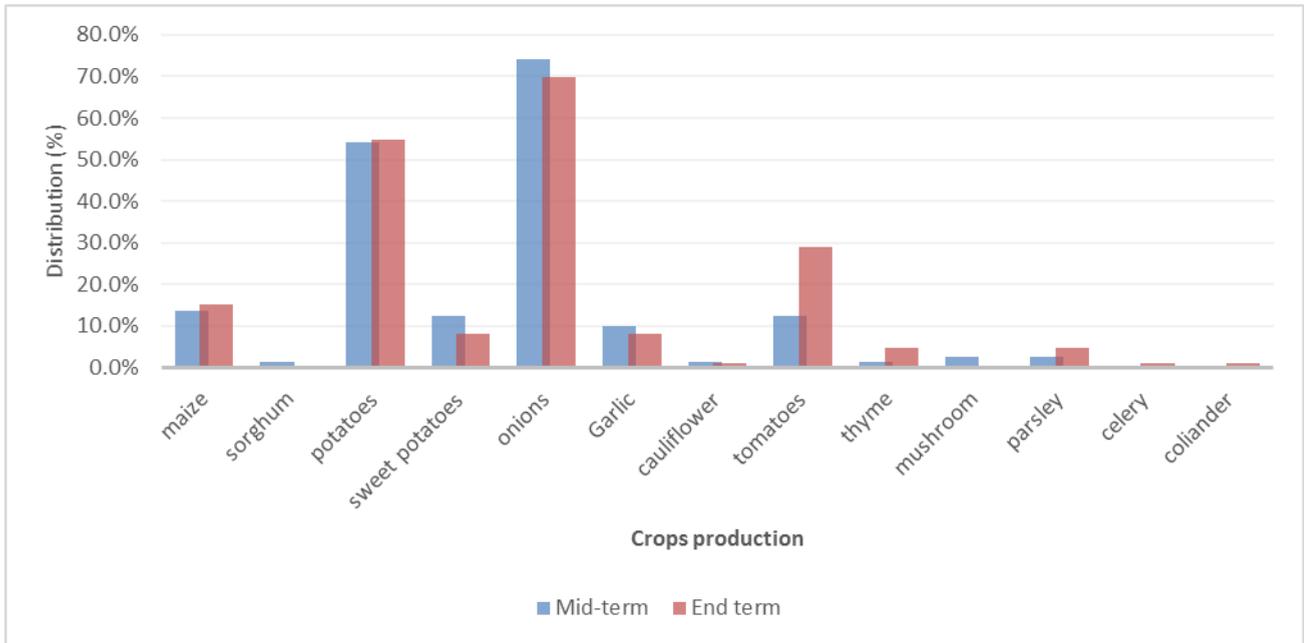


Figure 4.13 The types of crops and herbs produced by the households

4.5.4 Fruit plants produced in the home garden

The majority of the households (84%) planted their own fruits in the home garden. The fruits that were grown in the home gardens included peaches/apricots, grape, figs, apples, oranges/lemons, quenches, loquats, banana, pomegranate, guava, avocado and mango. The results show that, with sufficient space and access to water, households are able to grow a variety of fruits, vegetables, herbs and crops. Different types of crops (fruits, herbs and vegetables) are grown and harvested during specific seasons, hence different crops are available throughout the year. The Western Cape is a winter rainfall region. Its agriculture sector is unique in South Africa in that it is characterized by a high production of crops such as wine grapes (Green Cape, 2016).

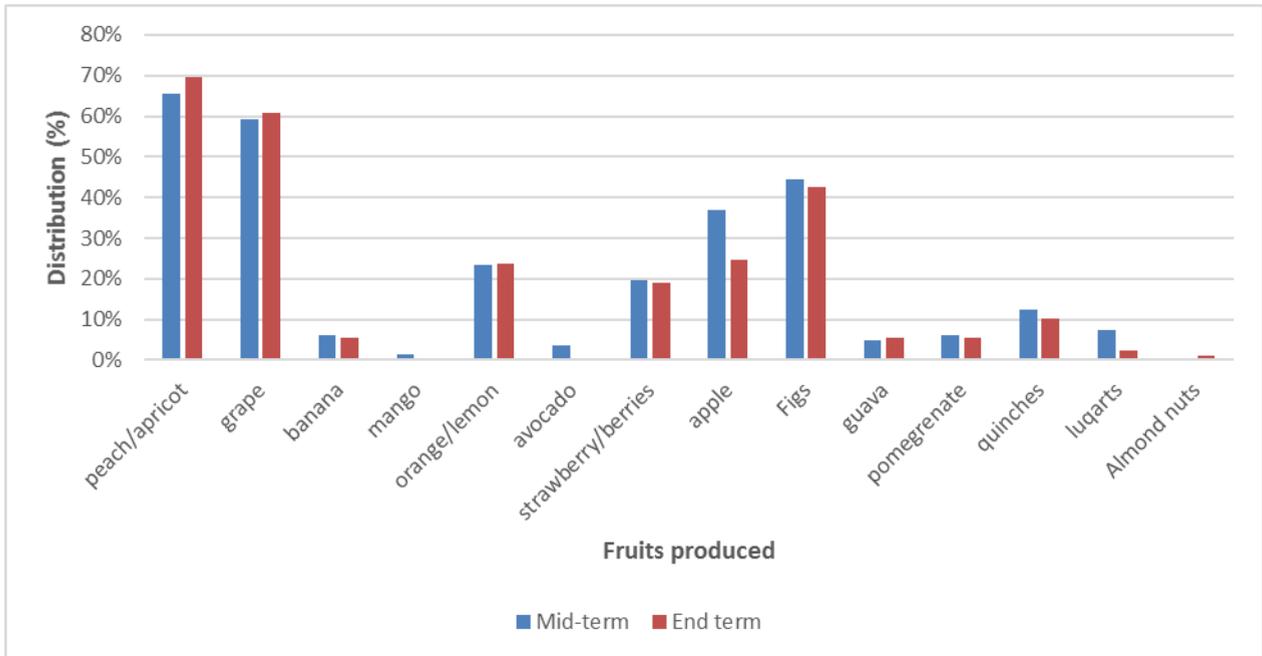


Figure 4.14 The type of fruits produced by the households in the garden

4.5.5 Livestock production in the household

Figure 4.15 shows that livestock production was minimally practised; only 10% of the households kept livestock. The types of livestock available were beef cattle, pigs, sheep, chickens, doves and geese. Of the 10% who kept livestock, 60% used it as a food source, 20% sold it for cash, while 20% used it for celebrations.

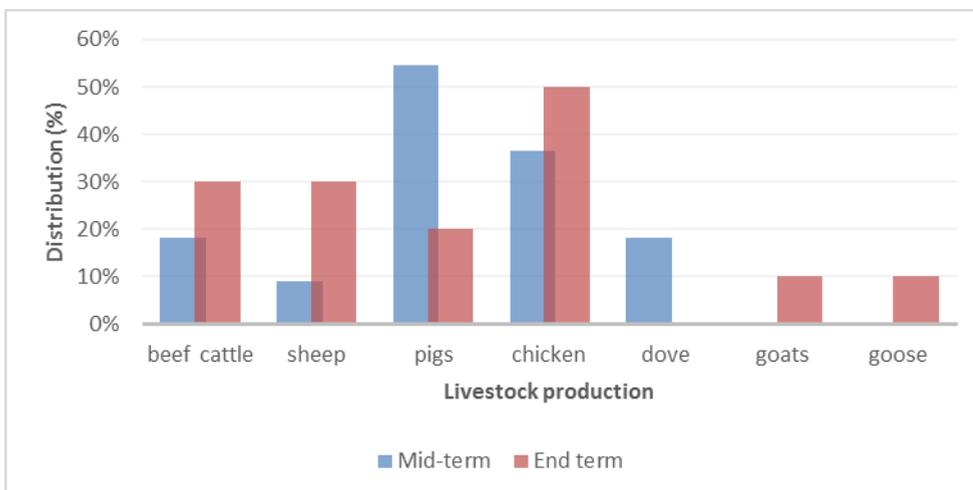


Figure 4.15 Types of livestock produced by the households

Agricultural activities practised by households in the study area included livestock production. The settlement is dominated by crop production and, therefore, much more attention is given to crops than to livestock production. Hence, only a few participants were involved in livestock farming. Although most food consumed in South African households is bought, crop and livestock production still occur on a low scale and these contribute to household diets (Maunder & Meaker, 2007).

Small livestock are easy to keep and can be used as a food source that can provide essential nutrients or sold for cash by the households. Households which are largely involved in livestock farming can increase household income and be food secure, either through the sale of livestock to generate income and through direct livestock consumption (Maziya *et al.*, 2017). A study which focused on the correlation between ownership of small-livestock and dietary diversity indicated that there is a positive association in households which are involved in small livestock and high dietary diversity (Taruvunga *et al.*, 2013).

4.6 Household access to water and sanitation services

4.6.1. Water access by the households

The results indicated that many households have access to clean and safe drinking water. The majority of the respondents (93%) used tap water in their homes, while 7% of the respondents used communal tap water as a source of drinking water. Households used water for many purposes, for example, for bathing, food preparation, cleaning, washing and household gardening. Since the households had access to water they were able to irrigate their crop/vegetable beds in the garden using a hosepipe (82%), buckets (17%), while 1% left the watering of their gardens to rain or furrows. The Dysselsdorp community has access

to clean and safe water within their dwellings and through public taps installed in places that are easily accessible by the residents. These findings confirm the report that, in the Western Cape Province, the proportion of households with access to pipe or tap water in their dwellings, off-site or on-site, is very high (Statistics South Africa, 2014).

The results are consistent with those of the 2015 Western Cape Provincial Treasury, (2015); the report revealed that 72% of the households in the Eden District have access to water within their dwellings and yards and within 200 meters. In South Africa, access to basic services, such as water, is a basic human right. Access to basic services has a major impact on the education and health status of the population and also on the country's economy (Western Cape Provincial Treasury, 2015). The results of this study confirm that the MDGs of sanitation and access to clean and safe water in South Africa has almost been realized, with the country being one of the developing countries that have achieved universal access to basic sanitation (WHO & UNICEF, 2015).

4.6.2. The type of toilet facilities accessed and used by households

Nearly all households had access to toilet facilities within their yards, with 95% of the respondents having access to flush toilets connected to a public sewerage system, 2% to bucket toilets and 3% to pit toilets. Households with access to toilet facilities and sanitation have a reduced incidence of enteropathy and this ensures food safety (Fanzo, 2014). Humphrey (2009) reports that children living in poor sanitary conditions ingest high concentrations of faecal bacteria, which may cause diarrhoea. The provision of toilet facilities reduces this and yields improvements in child growth, health and survival. This is yet another progress made towards the MDGs by 2015.

Household access to clean and safe water enhances the wellbeing of the households. A lack of clean and safe water, as well as inadequate sanitation, has an indirect effect on nutrition, and results in diarrhoea and also malnutrition (WHO, 2013). The majority of the respondents indicated that they had access to water, toilet facilities and electricity. However, the households indicated that electricity was expensive and that they did not have sufficient money to buy electricity units that can sustain them for the month.

4.7 Household food access

4.7.1 Reasons for producing food in the home garden

The majority of households (92%) produced food for consumption, 5% did so to exchange with neighbours and, lastly, 3% sold their produce for cash throughout the year. This may imply that the respondents preferred growing their own food rather than selling to raise an income or others. This ensures that households have access to a variety of crops at any time when required.

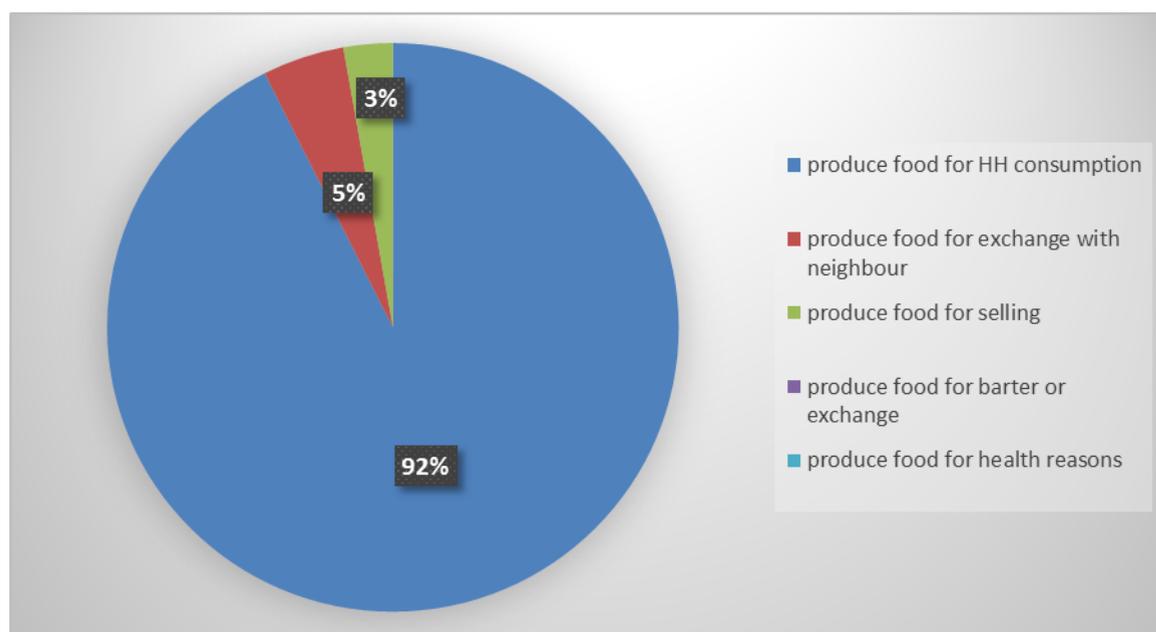


Figure 4.16 Reasons for producing food

4.7.2 Determination of how long food lasts in the household

Figure 4.16 shows that half of the respondents in the study produced enough food for a year while the other half (50%) did not. Households which did not produce enough food indicated that the crops which they produced lasted for a few days (40%), few months (26%), few weeks (23%), half a year (9%) and for a full year (4%). From the results presented, it is clear that households in Dysselsdorp preferred growing food for the consumption in their garden. Home gardening is associated with providing a direct food source and it facilitates a diversity of nutritionally rich foods such as roots, tubers, green leafy vegetables, condiments, nuts, legumes and fruits.

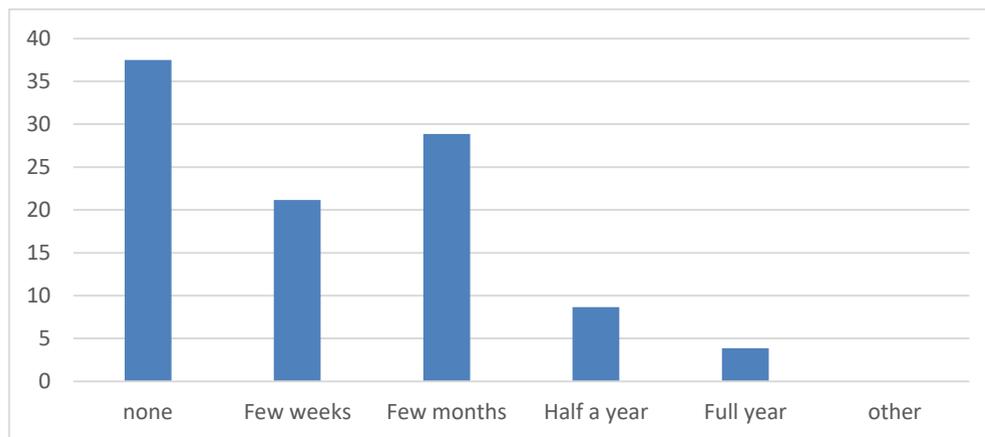


Figure 4.17 How long the food can last in the household

According to Fanzo (2014), when food production is insufficient in the household, it can have a negative effect on members' health, resulting in poor health and this limits their contribution in the food production process. However, if food production is sufficient, household income increases and, consequently, households will be able to buy nutritious food to achieve a diverse diet. They can also afford healthcare and other necessities. The households produce crops as a source of food for all its members, while others sell the crops for cash, and if the

food production is insufficient; in this regard, it may cause food shortages and lack of income within the households as they are depending on the crop production. Mkonda and He (2017) found that a decrease in the seasonal variability of crop yields caused frequent food shortages, hunger and economic turbulence, especially in the most vulnerable areas.

4.7.3 Households access to Fruit and Vegetables

All the respondents mainly purchased fruits and vegetables from the shops (supermarkets) in town and from local spaza shops in the area because the food procured from home gardens did not last the whole year. In the focus group discussions, the respondents also mentioned that, from time to time, when vegetables are in season, some farmers come to their rural town to hand out vegetables to those who are in need. The supply of food is often irregular and may not be available to households throughout the month or year. Fruits and vegetables are often available at certain times of year and, even when they are available, households may lack sufficient money to buy them. The results are consistent with those of Faber *et al.* (2011) who found out that most households purchased fruits and vegetables from supermarkets.

The distance that members of the household have to travel to marketplaces to purchase food also determines household accessibility to food. The cost of purchasing food increases as they also have to pay for both transportation and food. Prices are, thus, another determinant of food access that can affect households (Gross *et al.*, 2000). This suggests that the households are at risk of food insecurity due to high prices related to accessing food. The majority of South Africans buy their staple foods, as opposed to growing it themselves; therefore, they depend on having access to income in order to purchase the required staple food for the households.

4.7.4 Access to transport

Up to 91 of the respondents used public transport, 36 travelled on foot, five used own transport/cars and one person used a bicycle as a means of transport. The findings of the study suggest that the majority of the respondents do not have their own cars or transport and that they rely on different modes of transport, the most popular being public transport. According to Ballantine *et al.* (2008), the use of public transport may alleviate food-insecurity conditions of the households as opposed to those who have to walk to the shops.

Public transport is the main form of transport used by the households, followed by walking, driving own car and bicycle. The reason for this could be that only a few households, in rural areas own cars or vehicles, hence a large number depends on public transportation. Respondents from the focus interviews noted that using a taxi to the shops to buy food and other household necessities, is costly as they have to pay R30.00 for transportation. The households in Dysseisdorp have access to tarred roads and reliable transport is available. This means that they can easily access markets and, the result is that this contributes to improved livelihoods and easy access to food.

4.7.5 Food preservation practices

Fifty-three percent (53%) of the households indicated that they store food for future use. The methods used for storing food varied as follows: keeping in a dry place (26), sun drying (38), canning (6), freezing (53) and refrigeration (11). Rural households who produce vegetables commonly preserve food, in order to use over a long period. Through preservation, households are able to access fresh vegetables throughout the year and this may reduce

food insecurity. Some vegetables are available seasonally and these are preserved to enable the household to access them when they are out of season. Preservation methods, such as refrigeration and freezing (Ballantine *et al.*, 2008), drying and canning are used to ensure food availability during the dry season (Kennedy, 2009).

When many crops, such as root crops, onions, and nuts are produced, they are preserved and stored for long-term use by households. This prevents waste. Sun-drying is commonly used as a method of preserving food in most rural households. Crops are mostly seasonal and cannot be found throughout the year; therefore, preservation methods help to preserve vegetables and fruits during seasons when they are available in abundance in the market (Musemwa & Zhou, 2013).

4.8 Source of income

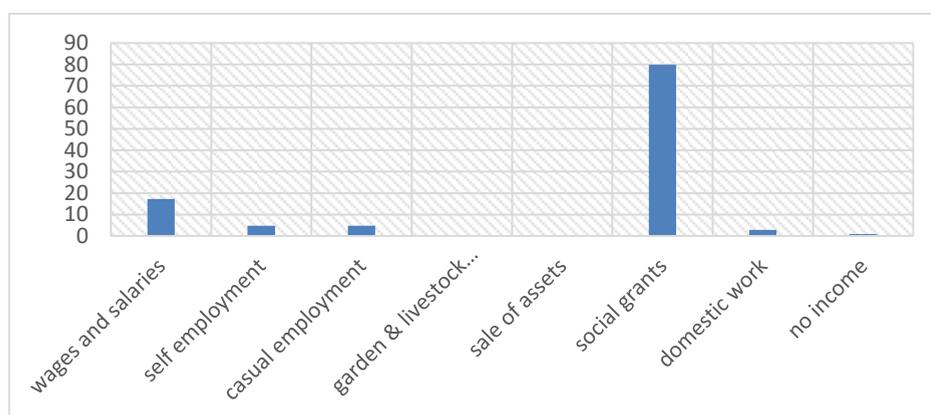


Figure 4.18 Household source of income

Household monthly incomes were categorized into six income groups. The majority of the households (80), in this study, received social grants as their main source of income, 17 received income from salaries or wages, five from self-employment, five from casual

employment, three from domestic work, and one received no income. Eighty-three percent (83%) of the respondents indicated that they received income over R1200 in a month, 8% received between R1000-1200, 2% R801-1000, 4% R601-800, 2% R201-400 and 1% received no income.

Very few people in Dysseisdorp have full-time jobs. Perhaps, this is due to the fact that the area is a rural community and that not many job opportunities are available. Most of the people have moved to the nearest towns and cities to look for better employment opportunities. The majority of the household members receive income from grants, hence, the income received in a month is over R1200.00 (currently the old age grants are R1600.00 per month). Those who are employed receive very little income and they are a smaller percentage. This also suggests that the jobs they are doing are casual or seasonal. Even though food shortages are a problem in the area, the money received in a month is not only used for food, but it is also used for other household needs. The results of this study suggest that the interviewed households mainly survive on government social grants.

Few households received income from multiple sources; However, social grants are the main source of income for the participating households. This could be attributed to the fact that rural livelihoods are characterized by seasonal farm work and some other forms of social assistance. The smaller percentage of those receiving income from employment could be because the community does not have easy access to places where they can find formal work. The results of this study are supported by the findings of Modirwa and Oladele (2012b) who discovered that the main sources of income are mostly the government social grants (old age pension and child support grants), casual employment, private transfers from seasonal jobs, and remittances from relatives and neighbours. Ruch (2015) also argues that

the average income in households in the Western Cape is derived from social security grants (pension, family allowance and social services).

According to Baiyegunhi and Makwangudze (2013), only a significant relationship between household income and food insecurity can be expected, since an increased income raises the household's purchasing power and improves access to food by households. South Africa ranks among the developing countries with the highest rates of income inequality and poverty in the world. Unemployment remains the biggest challenge in South Africa, hence there is a high dependence on social grants from the government. According to Statistics South Africa, (2014), the number of individuals who were benefiting from social grants increased in 2003 from 13% to 30% in 2015. From the provincial statistics, in the Western Cape, 1372 people (22% of the SA population) were benefiting from government social grants (Statistics South Africa, 2016b).

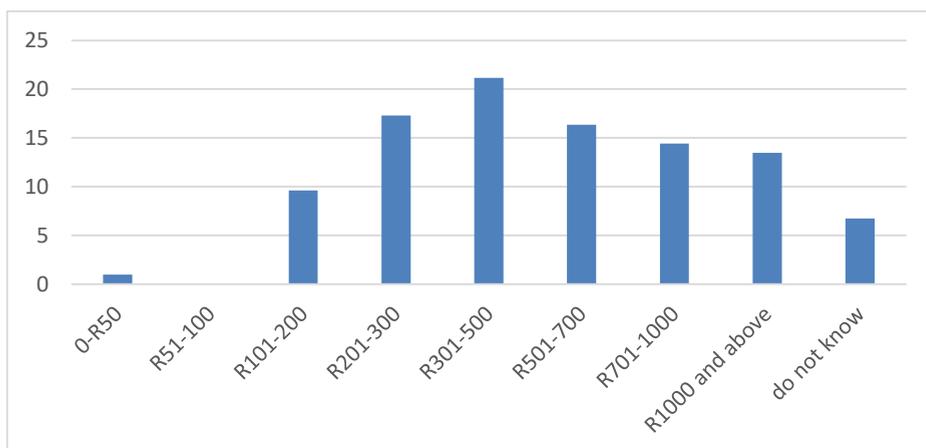


Figure 4.19 Distribution of amount spent on food in a month

The total money used for food expenditure in both terms were noted to be the same. The proportion of the household's income spent on food is 0-R50 (1%), 101-200 (10%), R201-300 (17%), R301-500 (21%), R501-700 (16%), R701-100 (14%) and above R1000 (13%), while 7% did not know how much they spent on food. Eighty percent (80%) of the households receive income from social grants every month. If the average number of people in a household with a total income of R1600 is five, then this means that the amount of money available to each person in that household per month is R320. This is the same amount that most households spend on food in a month and this indicates that the households are desperate for food.

The results show that the level of incomes in the Dysselsdorp settlement is very low considering that the households are large. This could lead to low expenditure activity in food. In addition, this limited income is also used for other household expenses. The study indicated that the majority of participating households bought their food in bulk once a month. The households who tended to buy food in bulk usually avoided the cost of multiple trips to the shops. The majority of the households bought food mostly in town, the town of Oudtshoorn, which is 30 km away from Dysselsdorp settlement, as it was considered cheaper and also, they were more options of places to purchase their food from. However, those households which purchased food on a weekly basis might have had sufficient money and transport to allow them to move around.

Few households bought their food from the local spaza shops which are within walking distance of their homes and are accessible at any time when needed. Prices at the local shops are often higher compared to those of supermarkets in towns. However, this expense could be made up for by saving money that could have been used for transport. The results of this study may suggest that the households are food insecure or at risk of food insecurity

due to the amount of money available to spend on food for the household as a whole. Households with an increased income can generally improve household food security as more food can be produced or purchased from the available resources.

4.9 The living standard measurement scores

The Living Standard Measurement (LSM) is a tool which focuses on household access to assets and facilities (Faber *et al.*, 2017). The LSM tool is widely used in the South African marketing and advertising industry for demographic segmentation. The LSM categories are referred to as LSM scores, which are labelled from level 1 to level 10. Households in the lower LSM score (categories 1 to 4) are considered to be poor and lack access to services, while households in the higher LSM scores (above 5) have improved access to resources and services. According to Schönfeldt *et al.* (2013), households that are below the score of four are often vulnerable to malnutrition and food insecurity.

LSM scoring and the categorization of households is based on their access to services such as flush toilets, tap water, electricity, ownership of cars and ownership of assets used to store and prepare food. In this study, the LSM score was used to measure household access to resources and assets that improve food access. The LSM score plays a role in the household's access to a diverse diet because, as the LSM level increases, so does the household socio-economic status. Thus, resources required to access food are improved.

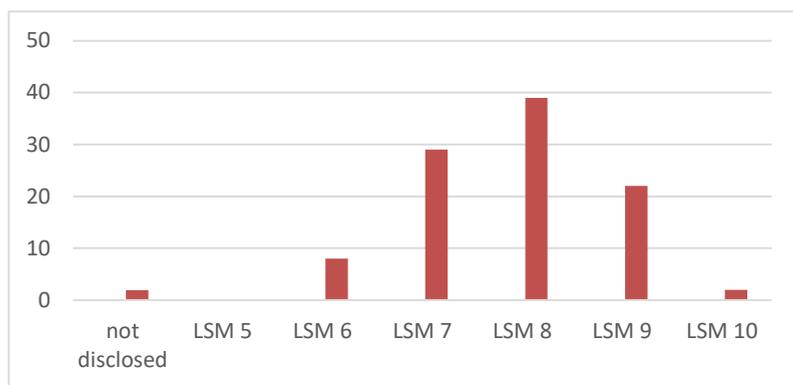


Figure 4.20 The LSM score ranges for households of respondents

Figure 4.20 shows that the LSM score for participating households in both terms (mid and end-term) is spread as follows: LSM 8 (39%), LSM 7 (29%), LSM 9 (22%) LSM 6 (8%), and LSM 10 (2%). The LSM results of the interviewed households indicate that households have improved access services and resources as all participating households fall between the LSM score of 6 and 10. Therefore, household vulnerability to malnutrition and food security was moderate and reduced. However, even if the households fall between the middle and higher SAARF LSM score levels, household access to nutritious food is limited and lacks diversity. South Africa, as a developing country, still has many households which fall into the lower and middle categories of the LSM; strategies should, therefore, be taken in order to raise the standard of living of these people (Martins, 2006).

LSM scores, such as life stages and income, can be used in conjunction with other indicators, to target population groups. The LSM scores data are combined with other descriptors such as language, income and life stages. Martins (2006) further explains that, if the people do not have access to land, the living standard is usually low. In addition, the condition of the land that people have access to should sustain them and prevent them from

living in poverty. A household with a pensioner receiving a social grant may have the resources or assets which place the household into a higher LSM score. However, it is not a given that they have a high disposable income or resources to spend.

The results of the study confirmed that both physical and non-physical assets owned by the households are important in determining the food security status of the households (Mango *et al.*, 2014). According to Gebre (2012), households who own productive assets, such as machinery, transportation and other resources, are usually food secured. A study by Labadarios *et al.* (2011) shows that, in South Africa, households with lower LSM scores have a greater low dietary diversity, thus reflecting that the household has little ability to access a variety of foods.

4.10 Home garden type and crops available

The type of soil where the gardens were practised was mostly loam soil (87%), sandy soil (8%) and clay soil (3%). Gardening styles used in the home gardens comprised of low beddings (46%), trench beds 34% and normal gardening (20%). Only 20% of the households used mulching in the garden. The focus group discussion revealed that these types of gardens (low, high and trench beds) were some of the techniques learned by students in the HFS programme. These techniques can be used to protect plants and improve the way they practice crop production. It is important for students to demonstrate to households in general and their relatives and neighbours in particular how to use correct crop beds when planting crops in their own gardens. The students also noted that they had taught the households new techniques on how to make compost and mulching from dry leaves and any food waste such as potato peels, onions, cabbage and pumpkin leaves.

Figure 4.21. indicates all the crops that were available in the garden during the time of the study. The most commonly produced crops during both terms were onions, pumpkins, grape trees, peach/apricot trees, fig trees, potatoes, beetroot, carrots, tomatoes, green beans and apple trees. The results show that, in this area, households produce fresh crops that play a significant role in their daily meal consumption.

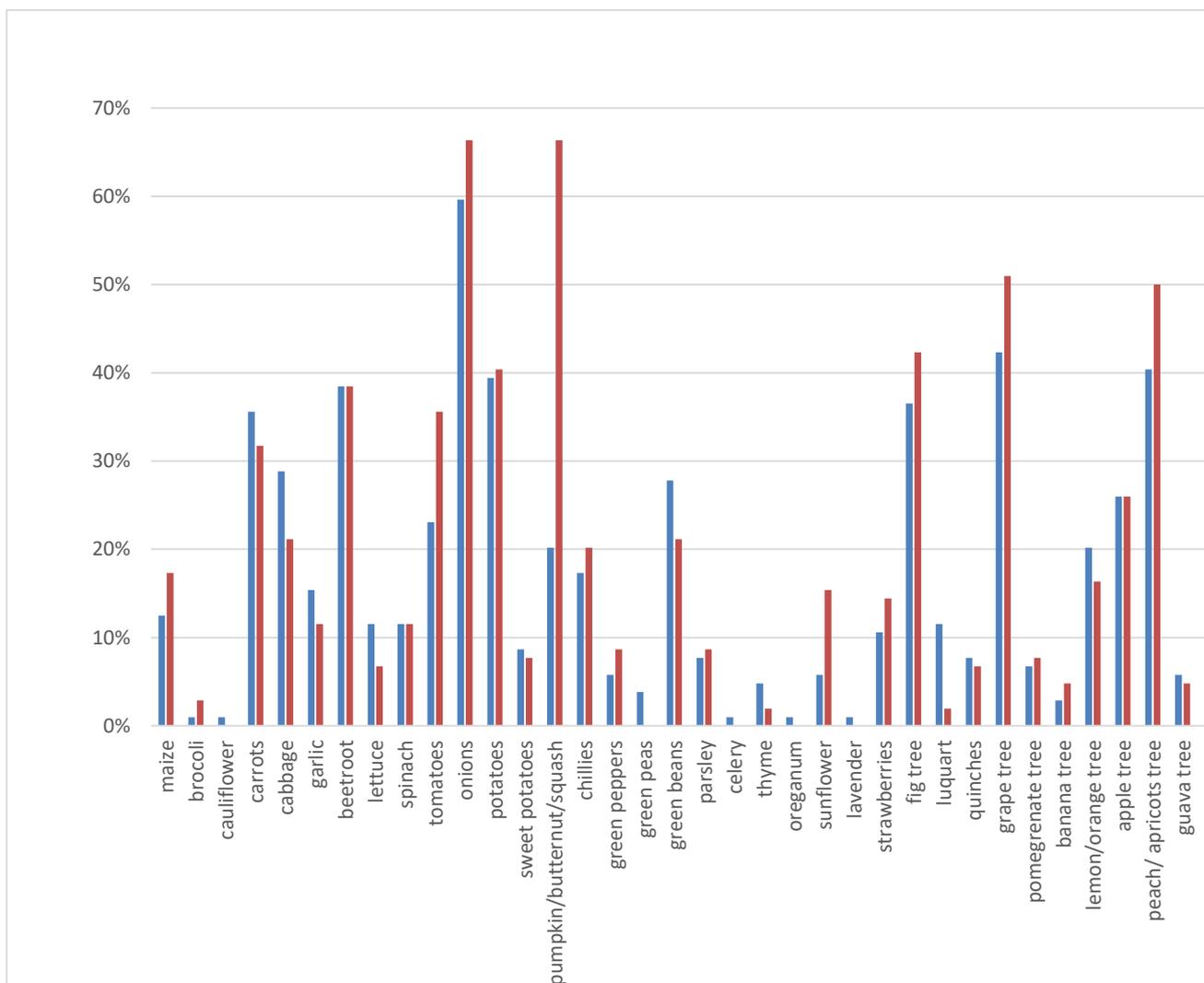


Figure 4.21 The crops, vegetables and herbs available in the garden

Households in the Eden District only have access to smaller portions of land. The size of a home garden varies from household to household and, normally, the average size is small as the same land is used to build a house. Garden activities were practised at the back, front and sides of the house. The size of the household garden can play an important role in the

food production and consumption of a household because of the availability of fruits and vegetables to consume or even to sell for cash. Modirwa and Oladele (2012b) found that dietary diversity increases when the farm is a bigger farm; the land sizes owned by participants ranged from one to four hectares.

4.11 What has the programme improved in your life or households?

This question was discussed in the focus groups interviews to find out if the programme was useful in their lives, especially with regards to food security. Respondents in all three groups noted that the programme had improved their understanding of food and nutrition. Students claimed that they now plan their meals around the food groups to balance their diets. Planning a diet with diverse foods is a bit challenging because some foods are not always available in the house.

The social grant was also indicated as an important contributor to household food security and daily expenses. Certain households received food parcels occasionally (after 3 months) from the municipality, meaning that those who lacked food could not access the food items every day or monthly as these food parcels would not be available every month.

4.12 Challenges faced by the households and students

All the households had access to land to grow their own crops. However, the major constraints experienced by households in their home gardens were discussed in the focus group discussions and the following challenges were noted: lack of water; and failing to water their gardens when necessary as water is expensive and they have to pay water bills monthly. They receive water subsidies or allowances of a certain amount to use in the house

and if they spend more than what they have been given, they are required to pay for the extra. Due to unemployment, many of the participants cannot afford to pay for water to use in the garden.

In addition, the home gardens are vulnerable to pests and plant diseases. Participants use traditional methods to stop or reduce the number of pests and diseases that attack plants. Sunflower is planted very close to pumpkin plants to protect the plants. Where households have no fences, animals are a major concern as they also destroy crops. During the night, thieves also steal vegetables, from homes which have no fencing to protect the crops. Fencing the home garden or the yard is expensive and most poor households cannot afford to fence their properties. Lack of money, lack of seeds and other supplies/equipment were also identified as major challenges making it difficult for households to maintain home gardens. Western Cape Province weather often has prolonged dry trends and variable rainfall, and this affects the agricultural sector and households which are involved in home food production (UCT, 2014).

The challenges faced by the households at the time of the study included the fact that households always expected incentives when the students visited them to monitor their gardens. In addition, the households were not interested in working hard to maintain their gardens and to do other gardening activities. Because some households had received water tanks from the government (Department of Agriculture), participating households also expected to get incentives, seed and water tanks from the programme. Students recommended that modules should be structured and planned in such a way that nutrition education would be done at the beginning of the programme and gardening activities at the end.

CHAPTER 5

CONCLUSSION AND RECOMMENDATIONS

5.1 Introduction

The chapter draws conclusions from the findings of the study and discusses whether the objectives of the study were addressed and answered. Based on the results of the study, recommendations are made for future action and research.

5.2 Summary of the main findings

The study looked at the socio-demographic profiles, access to nutritious foods and practices which increase household access to nutritious food. The study sample was made up of 100 Households and 30 students attending a one-year short learning programme on household food security at the University of South Africa.

5.2.1. Demographic data

The results of the study indicate that the largest number of participants were above 60 years, followed by the 51-60, 41-50, 31- 40 age groups in that order. The age group with the lowest number was between 21 to 30 years. Most of the households have been living in the area for over twenty years.

The results revealed that the households had an average number of five members and most of these members were females. The study found that females, in general, were responsible

for purchasing and preparing food in the household, as well as playing a more active role in home garden activities than men.

The level of education in Dysseisdorp was low, and most household heads did not complete matric (grade 12). Education plays an important role in fighting against food insecurity in that the level of education the household head has acquired positively enhances his/her income earning capacity and possibly improves access to food (Maziya *et al.*, 2017).

5.2.2. Household coping strategies

The smallest number of participants indicated that they 'go to sleep hungry' or 'go a whole day and night without eating' and according to the CSI, those households which are food insecure use different strategies to cope with food shortages. When food was insufficient, the households relied on a variety of coping strategies to feed their families. These strategies included asking for help from family or neighbours (36), depending on charity/grants (33), finding other sources of food (23), collecting wild food (17), finding additional sources of income (5), relocating to live somewhere (4), exchanging assets (3), working for payment/food (3) and borrowing money to buy food (1). The findings in this study provide some evidence that households in this settlement are vulnerable to food insecurity and that they tend to employ adaptive strategies to improve their access to food, as well as participating in home gardening activities.

5.2.3. Food consumption patterns

From the 24-hour recall, the following food groups were high on the list of foods eaten by the households: roots, tubers and cereals, followed by meat. The least consumed were fish,

eggs, milk, oils, salt and sugar. The majority of households consumed meat and starch, which they purchased from the shops, and they grew their own potatoes, onions and pumpkins. The least consumed food group was fruits, implying that a significant number of households are not getting important nutrients and micronutrients that are found in fruits. In addition, the household diet lacked fruits, vegetables, eggs, fish and milk, which contain important nutrients in the diet

Using the 24-hour food recall as proposed by FANTA, the HDDS was calculated based on the 12 food groups (Swindale & Bilinsky, 2006). The consumed food groups were summed up, and the mean score was used to determine diet diversity. The finding in this study is that the average HDDS increased from 5.6 to 6.4, with a standard deviation of 1.5, which is above the recommended cut-off point for dietary quality (Steyn *et al.*, 2006). Up to 31% of the households had HDDS below the mean of four, while 69% were above the mean (five and above). Households with an HDDS above five can be considered food secure since a higher the HDDS means that the households have a lot of food from different food groups in their diet (Labadarios *et al.*, 2009). The results show that, according to the HDDS, households have access to food, indicating that, on average, from the 12 food groups, the households consumed six different food groups. This made the household's food secure and able to fight against hunger.

The results from the seven days food frequency recall show that most of the food products were being fairly consumed, with potatoes being the most consumed, followed by rice, bread, chicken, pasta, porridge, lentils, beef, coffee, tea, beans and fish. The results show that all households consume cereals as part of their diet. It was also noted that there is a

high percentage of households who consume tubers and roots, as well as beans and onions. This could be due to the fact that households grow their own food and, thus, have access to these foods through that.

Most of the households (97%) did not consume spinach or leafy green vegetables. However, the consumption of vegetables such as carrots, cabbage, onion and pumpkin was high. The high consumption of onions, carrots, tomatoes and cabbage is consistent with those from Ruel *et al.* (2004) which show that these vegetables are common in sub-Saharan Africa. Such vegetables are usually consumed with a staple food (rich in carbohydrates) or used as soups or gravy in meals (Smith & Eyzaguirre, 2007). Fruits were the least consumed food groups in the households. However, the frequently consumed fruits were apples (5), oranges (3), bananas (3) and watermelons (1).

Over 60% of the households consumed protein of animal origin. Chickens were the most consumed (66), followed by beef (43), fish (35), organ meat (livers) (10), lamb meat (8), ostrich meat (8) and consumed pork (1). The households consumed little fish; the most common form of fish consumed was canned fish (over 35%). Fish is a good source of protein, micronutrients and it is also low in fat. However, its consumption in sub-Saharan Africa is reported to be declining in all regions (Béné & Heck, 2005).

The results show that households which consumed milk increased from 19% to 21%. The same trend was noted in the consumption of eggs; Household consumption of milk increased from 16% to 35%. Even though there is a slight increase in consumption, this study shows that the intake of eggs and milk remains low in this study area. Consumption of butter/oils, spices, salt and sugar is low. Caffeine was moderately consumed by half of the households. The results confirm that there is a low intake of salt and oils among these households as

recommended by the SAFBDGs which states that fats and salt should be eaten sparingly (Vorster *et al.*, 2013).

5.2.4. Household income and expenditure on food items

The main source of income for the households were government social grants. The income received in these households was small and they are expected to stretch it to buy food and pay for other things needed by the households. Relying on social grants may be due to the low levels of education of participants and lack of employment. The proportion of the household income spent on food is between R200 to R1000 for both terms. The amount of money spent on food is low compared to the total number of members in the households. In addition, the results show that, with the low level of incomes in the Dysseisdorp settlement, this could be the reason why there is low expenditure activity on food in the participating households. There is a significant and negative relationship between household incomes and household food insecurity; an increased income also increases a household's ability to purchase and improve its access to food (Baiyegunhi & Makwangudze, 2013).

The study showed that the majority of households bought their food in bulk once a month. Most of the households bought food mostly in town, as it was regarded as cheaper than that which was sold in the local spaza shops. They also have more options for shops to buy from in a town than in the rural areas where they resided. Few households bought their food from the local spaza shops which are within walking distance of their homes and are accessible at any time when needed. Households with an increased income can generally improve

household food security as more food can be produced or purchased from available resources.

5.2.5. Household gardening

Most households grow their own fruits, vegetables and crops. In addition, only a few households (10%) practised livestock production. The type of fruits and vegetables grown can also be influenced by the household's accessibility to water the plants. The type of fruits produced were apples, oranges/lemons, bananas, grapes and watermelons. Vegetables such as carrots, cabbages, onions, potatoes, pumpkins and tomatoes were also grown. The households mostly produced traditional plants to use as vegetables, herbs, spices and for medicinal use. The households who produced livestock, in this study, had beef, cattle, pigs, sheep, chickens and geese. The livestock and crops produced by the households were mostly for consumption by the families themselves.

5.3 Limitations

This study was limited to the students who were registered in the HFS short learning programme and households that the students were working with. This means that the results do not provide information about other households that were not participating in the short learning programme. The government handed out water tanks to a few households for water storage around the settlement, thus leaving some households under the impression that they will also receive water tanks or equipment to use in their gardens if they worked with the students. There are respondents who refused to answer certain questions (such as the income they received monthly, how much they spent on food, and lastly the type of food

items they purchased in the household) and this made it difficult to determine the financial status, household expenditure patterns and food consumption of those households. The number of households interviewed decreased during the course of the study as most of the home gardens were not successful due to weather conditions and lack of proper gardening skills. Some households dropped from the programme for various reasons such as illness, not having seeds, working elsewhere and not being available during daytime).

Fruits and vegetables, such as onions, pumpkins and spinach, were harvested at the beginning of the year, could explain why most household gardens did not have fresh crops but only dry leaves which were notably visible from the ground and this also influences what is available in the household's diet. These findings may not be generalized to households in the rest of the Dysselsdorp settlement, due to the fact that a small number of households participated in the study used. Future studies or research on food security should be planned carefully around the area and district so that more data can be collected.

5.4 Recommendations

5.4.1 Recommendations for households to improve diet diversity

As noted in this study, household diets were diverse. However, their diets lacked fruits and vegetables. The participating households in Dysselsdorp settlement included at least three vegetables in their diet when they were available and very few households consumed fruits. Their diet is starch-based (high in carbohydrates and protein) but low in micronutrients (fruits, vegetables and milk). This is most common in households residing in rural areas. Nutrients can only be sufficient if households consume diverse diets that include all the food groups. Improving economic access and being able to produce crops are, therefore, critical to

increasing the frequency and variety of fruit and vegetable intake (Faber *et al.*, 2017). When crop production is practised throughout the year, it improves household access to food in all seasons of the year and promotes self-sufficiency. Therefore, households are advised to row a variety of crops and to increase production of small livestock.

Households should consider eating vegetables at all times during meals. Labadarios *et al.* (2011) argue that the South African diet typically lacks variety and advises that households should increase their consumption of vegetables and fruit in order to address this situation. The households generally do not eat all traditional vegetables; these go to waste and yet they are rich in vitamins. The Dysseisdorp community should have programs where they can share knowledge about traditional vegetables in order to increase production, and retain the nutritional value during preparation. Households must be encouraged to include traditional vegetables in their diet. Households can improve their dairy product intake by increasing their expenditure on this food group; they can use savings obtained through the use of home-grown vegetables.

5.4.2 Recommendations on nutrition education

The findings of this study revealed that a few households were involved in livestock production. Many households do not have direct access to livestock that could be used as a food source, or to sell for cash. It was noted that, even though households have access to home gardens, they still do not eat fruits and vegetables that are recommended for consumption on a daily basis. It is important for households to improve and increase crop and livestock production. Households must be encouraged to produce more food for household consumption, to sell for cash, as well as to barter with neighbours or within the

community. According to Talukder *et al.* (2000), home gardening improves household diets and is a source of additional income.

The government should introduce programmes aimed at community development, and at educating and promoting healthy eating habits as recommended by the food group's dietary guidelines. It should promote the importance of a healthy and diverse diet. The programmes should be targeted at needy communities and their aim should be to promote the use of indigenous foods that households can grow themselves. The training or workshops on nutrition education should be continuous. In addition, nutrition strategies, such as basic sanitation, guidelines on food handling, food storage and food preparation, should be promoted. This, in turn, will improve dietary diversity and ensure healthy food choices within the households.

5.4.3 Recommendations on job creation opportunities

The results of this study indicated that the respondents in the area lacked formal employment and the majority of households relied more on social grants than formal jobs. Other residents in this rural settlement were migrating to urban areas and the closest towns in search of better employment opportunities and service delivery. People move from their rural settlements to urban areas due to limited employment opportunities in the rural areas (Trefry *et al.*, 2014).

Income generation projects such as small-scale businesses are important to the unemployed population. These promote self-reliance and reduce reliance on the government for all the needs. Such projects can help the people to develop entrepreneurial skills and to earn a

living. Other projects should be aimed at the municipality or government in providing the households with access to land for livestock production, crop production and off-farm work that can aid households and communities to survive.

It is recommended that the government should come up with initiatives to create more job opportunities. These job opportunities will enable individuals and communities to have access to food and, thus, reduce reliance on social grants. Initiatives, such as the CWPs that will help both the youth and adults to receive a stipend are also helpful in rural areas. Job creation opportunities for women and men should be imperative and the potential of agriculture, as well as rural areas, should be harnessed (FAO, 2013). The income from potential job opportunities combined with the social grants that are available can improve the household's income, and consequently, improve food security and access to resources. Job creation will not only improve the financial status of the targeted population, but it will also improve the country's economic growth.

5.4.4 Recommendations on household gardening or farming

As noted in the study, all participating households produced food crops from their home gardens. However, their food production could not sustain them for long periods. According to Taruvinga *et al.* (2013), households which produce food in their home gardens are positively linked to an increased dietary diversity. Hart and Aliber (2010) argue that home food production addresses food shortages and results in reduced incidents of hunger. Strengthening household food production is an important future element in increasing household access to food (West & Mehra, 2010).

Agriculture production, as a source of food and/or income, requires attention and should be encouraged particularly considering that most households are involved in food production for their own consumption. Information on pest and insect control should be provided to households and this will enable them to do their gardening activities without fear of losing their crops due to plant diseases.

It is recommended that government should support rural communities involved in farming activities by providing them with the necessary resources that will support their farming activities. The government should provide resources such as water tanks for storing water and incentives such as seeds. In addition, the government should educate households and/or communities on how to manage their gardening and produce, in order to reduce reliance on government handouts. Lastly, the government should initiate activities which will see households and communities harvesting rainwater in tanks and also conserving water conservation using methods such as recycling of water for use in the garden.

5.4.5 Recommendation to the challenges faced by the households and students

All participating households had access to land to grow their own crops. However, the major constraints experienced by these households in their home gardens included the following: failure to access adequate water access in the settlement; failure to water their gardens when required; and costly water bills which had to be settled monthly. It is recommended that households should reuse water that was used for household chores such as cleaning and washing of dishes and clothes to water their gardens.

Home gardens are vulnerable to pests and plant diseases which destroy crops. However, households use traditional methods to stop or reduce the pests and disease attacks on

plants. Sunflower is planted very close to the pumpkin plants in order to protect from pests. This practice of planting sunflower is helpful and households within the community should share other ideas that can be used to protect plants. The Department of Agriculture must provide expertise in pest and disease management. Households must be encouraged to plant a variety of crops that are suitable for different seasons, in order to have a good harvest. Households should also work together as a community and approach relevant departments or community organizations to discuss their living conditions and the resources they need to enable them to work in their gardens.

Certain households had a problem with thieves who were stealing their vegetables during the night. This was because they had no fence to protect their crops. Fencing of the home gardens or yards is expensive and most poor households cannot afford to have a fence around their homes. Lack of money, seeds and other supplies/equipment were also identified as major challenges facing households in their gardening endeavours.

Animals were another concern due to the lack of fencing. Animals ate and destroyed crops where gardens were not fenced. Households should come up with ideas on how to protect their gardens, for example, making use of wood and wire to fence their gardens to protect their crops. The government should provide means and resources to support households in their gardening activities. It can help by supplying seeds, irrigation equipment and required tools.

The challenges faced by the households when they working with students included households always expecting incentives in the form of groceries when students visited them to monitor their gardens. In addition, the households were not interested in working hard to maintain their gardens and other gardening activities. Students recommended that modules should be structured and planned in such a way that learning activities would commence

with nutrition education and then end with gardening activities towards the end of the programme.

Students, programme coordinators and the UNISA Short Learning Programme facilitators must liaise and work with the Department of Agriculture, in particular with agricultural extension officers. They must also work with the Department of Health, NGOs and CBOs available in the community. The advantage of such collaboration is that such departments or organizations are aware of the challenges that people face in a particular area. In addition, students should handover gardening activities to these organizations after completing their programme. These organizations can constantly work with these households and encourage them to continue planting fruits, vegetables and crops that contribute to food security. Students should also work closely with other relevant departments which focus on food security and nutrition. These organizations can take over the role of nutrition education and promote the continuation of the gardens when the students have completed their programme.

In addition, for the programme to work efficiently, curriculum designers should collaborate with relevant departments such as the Department of Agriculture (agricultural extension officers), Department of Health, Department of Water Affairs, NGOs & CBOs as well as community leaders who are working in that community. The curriculum should also include home gardening and agricultural skills (i.e. irrigation, pruning, cultivating, mulching), in order to help households to successfully implement and participate in activities that will aid in the production of a variety of fruits and vegetables. Collaboration among households, organizations and the government in promoting the growth of a variety of crops will assist in achieving household food security.

5.4.6 Recommendations for further research

The study focused on socio-demographic profiles, access to nutritious foods and practices which would increase household access to nutritious food by the participating households. It is evident that more information on food security in the community and throughout the country is required. It is, therefore, crucial to extend the study to households in many different communities around the provinces to determine all factors surrounding food security in South Africa.

Further research and collection of relevant data are required to get more information and to understand household food insecurity, socio-demographic indicators influencing food insecurity, as well as the coping strategies of the households in the rural areas. Similar studies should be conducted in rural areas to determine the food security status and diet diversity of households. Appropriate recommendations can then be made and suitable strategies to fight food insecurity in the country can be put in place to address food insecurity problems.

5.5 Conclusion

The study looked at access to nutritious foods in Dysselsdorp in the Western Cape Province. Socio-demographic, economic and food consumption patterns of the sampled households were studied. Households in the Dysselsdorp rural settlement are large and have low levels of education, high levels of unemployment and they also rely on social grants for income. In addition, women are responsible for almost all the activities pertaining to food in these households.

The aim of the study was to determine household access to nutritious food and diverse diet. Finding revealed that the households had access to certain types of food. Access to diverse and varied foods by households participating in the food security short learning programme increased throughout the term, with the households being taught to produce crops in their home gardens. All households were producing fruits and vegetables in their gardens. However, despite an increase in food production in the households, consumption of fruits and vegetables remains low. Fruits and vegetables are important in providing nutrients and micronutrients for household members.

Because of this, the HDDS has remained average. Even though the households were above the cut-off point of being vulnerable to food security, more variety and the diverse food is required in their diets. The low number of households participating in livestock production makes it impossible for households to access meat from livestock production. The major constraints experienced by the households were due to insufficient water for gardening, as well as insect and plant diseases destroying the crops. Households with no fencing experienced problems with animals destroying and people stealing the crops. In addition, participating households expected incentives for working with the students in their home gardens.

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APPENDIX A: BASELINE QUESTIONNAIRE

Baseline Month..... Year.....
 Mid-term
 End-term

Household Questionnaire Information

Site :	Questionnaire	
Interviewer Name :		
District :		
Municipality :		
Suburb/Ward/Village		
Street address :		
GPS code :		
Name of person interviewed :		
Age of respondent :		
Contact details for respondent:		

SOCIO- DEMOGRAPHIC INFORMATION

S1. Person responsible for preparing or cooking food for the household

(Circle relevant answer)

- 1 Male head
- 2 Husband
- 3 Female head
- 4 Wife
- 5 Married daughter or daughter-in-law
- 6 Young teen mother
- 7 Girl Child
- 8 Yourself
- 9 Any other person.....

S2. Person responsible for buying food for the household (Circle relevant answer)

- 1 Male head
- 2 Husband
- 3 Female head
- 4 Wife
- 5 Married daughter or daughter in law
- 6 Young teen mother
- 7 Girl Child
- 8 Yourself
- 9 Any other person.....

S3. Person responsible for keeping/working in the home garden
(Circle relevant answer)

- 1 Male head
- 2 Husband
- 3 Female head
- 4 Wife
- 5 Married daughter or daughter-in-law
- 6 Young teen mother
- 7 Girl Child
- 8 Yourself
- 9 Any other person.....

S4. For how long have you been living here? (Circle relevant answer)

- 1 0-5 years
- 2 6-10 years
- 3 11-15 years
- 4 15-20 years
- 5 21-30 Years
- 6 Lifetime.....
- 8 Temporally.....
- 9 Other.....

S5. Where did you live before? (Circle relevant answer)

Name of place.....

- 1 Rural area
- 2 Peri-urban area
- 3 Urban area
- 4 Other, specify.....

S6. How many male members are there in this household?

Indicate the number of male members in the relevant box, e.g. 1 or 3.....

6.1 Male Adults	1	61 and older	
	2	51-60	
	3	41-50	
	4	36-40	
6.2 Male youth	1	31-35	
	2	26-30	
	3	19-25	
6.3 Male Children	1	13-18	
	2	10-12	
	3	6-9	
	4	2-5	
	5	0-2	

S7. How many female members are there in this household?
 Indicate the number on the relevant box, e.g. 1 or 3...

7.1 Female Adults	1	61 and older	
	2	51-60	
	3	41-50	
	4	36-40	
7.2 Female Youth	1	31-35	
	2	26-30	
	3	19-25	
	4	Pregnant mothers	
7.3 Female Children	1	13-18	
	2	10-12	
	3	6-9	
	4	2-5	
	5	0-2	

S8. How many people in this household are not direct family members? (Circle relevant answer and answer 5)

- 1 None
- 2 1-2
- 3 3-5
- 4 More.....
- 5 How many are not direct family are below 12 years (write number).....
- 6 Of these how many children are under 2 years (write number).....

S9. Do these members add to family income? Yes No

S10. What is the highest education level of the food caregiver or interviewee?
 (Circle relevant answer)

Primary	1	Grade 0 - Std 1 or Grade R -Grade 3	
Intermediate	2	Std 2 -5 or Grade 4-7	
Secondary	3	Std 6-7 or Grade 8-9	
	4	Std 8-10 or Grade 10-12	
	5	Skills programme (NQF 1-4).....	
Higher Education	6	Certificate (one year after matric) NQF 5	
	7	Diploma (three year)	
	8	Degree	
	9	Other.....	

S11. What is the highest education level of the person earning the most income? Specify.

.....

FOOD UTILIZATION

U1.1 What foods did the household eat the previous day (24 hours or one day). Write food names: Start with the foods they ate since they woke up. When was the food consumed?

NB: Fill in as completely as possible, e.g.

explain the type of food (meat: chicken breast / chicken feet/ lamb chops / beef mince / Mutton, etc.),

As well as ingredients used to prepare food (stew added tomatoes, onions, carrots, mutton, etc.)

NB Record if sugar and fats (oil/butter/margarine) are added to the dishes.

First food / Breakfast	In - between	Midday / Lunch	In between after lunch	Evening / Supper	Before bed-time

U2. Who in the family is served first? (Circle relevant answer).

- 1 Father/men in the family
- 2 Mother/women in the family
- 3 Children
- 4 All eat at the same time
- 5 Lives and eat alone
- 6 Eats at the soup kitchen, feeding scheme
- 7 Other specify.....

U3. In the past four weeks, did members of your household...

3.1. Experience a time when there was no food at all to eat in the house because of lack of money or resources.

0= No

1= rarely or sometimes (1-10 times)

2= Often (More than 10 times)

3.2. Go to sleep at night hungry because there was not enough food? 0= No

1= rarely or sometimes (1-10 times)

2= Often (More than 10 times)

3.3. Went a whole day and night without eating anything at all because there was not enough food for all household members?

0= No

1= rarely or sometimes (1-10 times)

2= Often (More than 10 times)

U4. How did your household cope/managed during such periods of hunger? Circle the relevant answers

- 1 Found other additional sources of income
- 2 Asked family/relatives/neighbours for help (money/food)
- 3 Family members/children went to live elsewhere
- 4 Sold or exchange assets for money/food
- 5 Worked for payment or food in kind
- 6 Collect or hunt veld/wild foods/herbs
- 7 Dependent on charity/welfare/grants
- 8 Borrowed money/food
- 9 Could not do anything
- 10 No problem to cope

FOOD AVAILABILITY

V1.1 Do you grow vegetables? (Circle the relevant answer) 1= Yes 0= No.

V1.2 If yes, where do you grow them?

- 1 Household garden
- 2 Crop field
- 3 Containers
- 4 Community garden
- 5 Other specify.....

V2.1 Do you also grow traditional or wild food? Circle 1= Yes 0= No
Or do you collect indigenous / wild food in the veld?
(Circle the relevant answer). 1= Yes 0= No

Name forest food/veld/wild/medicinal herbs in nature or garden

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

V3. If YES in V1.1 you grow vegetable crops, If NO skip to question 4.1
Which vegetables do you grow?

- 1 Cabbage
- 2 Carrots,
- 3 Beetroot
- 4 Pumpkin
- 5 Green leafy vegetables (also local /indigenous)
- 6 Green beans
- 7 Beans usually dried
- 8 Maize/sorghum
- 9 Other specify.....

Where do you grow vegetable crops?

- 1 Household garden fenced
- 2 Household garden not fenced
- 3 Field close to home
- 4 Field far from home
- 5 Community garden
- 6 Other, specify.....

V4.1 Do you grow field crops? (Circle relevant answer) 1=Yes 2=No
If NO, SKIP to Question 4.1

V4.2 If yes, where do you grow them?

- 1 Household garden fenced
- 2 Household garden not fenced
- 3 Field close to home
- 4 Field far from home
- 5 Community garden
- 6 Other, specify.....

V4.3 If yes, which crops do you produce? (Circle the relevant answer(s)).

- 1 Maize
- 2 Wheat
- 3 Sorghum
- 4 Potatoes
- 5 Sweet potatoes
- 6 Cabbage
- 7 Onions
- 8 Other, specify.....
- 9 Indigenous specify.....

V4.4 How much of the harvest (%) is sold in a year
1= Some 2= Half 3= All

V5.1 Do you have your own fruit trees? (Circle relevant answer) 1=Yes 2=No
If NO, SKIP to Question 6.1

V5.2 If yes, what do you grow? (Circle relevant answer(s))

- 1 Peaches/Apricots
- 2 Grapes
- 3 Bananas
- 4 Mango
- 5 Oranges, lemons,
- 6 Avocado
- 7 Strawberries or any other berries
- 8 Apples
- 9 Other, Specify.....

V6.1 Do you have any livestock? (Circle relevant answer) 1=Yes 2=No
If NO, SKIP to Question 7.1

V6.2 If yes, which livestock do you own and how many?
(Circle relevant answer and write the number on the dotted line)

- 1 Beef cattle, how many.....
- 2 Dairy cattle, how many.....
- 3 Sheep, how many...
- 4 Goats, how many...
- 5 Pigs, how many.....
- 6 Chickens, how many.....
- 7 Wild game / fish from nature.....
- 8 Other, specify.....

V6.3 How do you use the livestock? (Circle relevant answer).

- 1 For celebrations
- 2 As a food source (slaughter)
- 3 To sell for cash
- 4 Other, specify.....

V7.1 Where do you usually get water for the garden? (Circle relevant answer).

- 1 River and pump
- 2 Borehole with pump
- 3 Piped water from taps
- 4 Water tap in yard
- 5 Rain water harvesting from tanks, drums
- 6 Use grey water
- 7 Other, specify.....

V7.2 How do you water/get water into beds? (Circle relevant answer).

- 1 Rain run-on water, furrows, ridges, etc.
- 2 Carry water with buckets
- 3 Garden hose
- 4 Low-input irrigation from small tanks
- 5 Irrigation with pump

V8. What is your household's main source of drinking water?

1. Piped (tap) water in house
2. Piped (tap) water in yard
3. Borehole water in yard
4. Rain-water tank in yard
5. Neighbour's tap
6. Public/communal tap
7. Water-carrier/tanker
8. Borehole outside yard
9. Water from stream/river
10. Water from dam/pool
11. Well
12. Spring
13. Other, specify.....

V9. How far is the water source from the dwelling or yard? (Circle relevant answer).

1. Less than 200 metres
2. 201 - 500 metres
3. 501 metres - 1 kilometre
4. More than 1 kilometre
5. Do not know

V10. Does the household pay for water? (Circle relevant answer).

1 = Yes

0 = No

V11. What type of toilet facility does this household use?
(Circle relevant answer).

1. Flush toilet connected to a public sewerage system
2. Flush toilet connected to a septic tank
3. Chemical toilet

4. Pit latrine/ toilet with ventilation pipe
5. Pit latrine / toilet without ventilation pipe
6. Bucket toilet
7. None
8. Other, specify.....

V12. Is the toilet facility in the dwelling, in the yard or outside the yard? (Circle relevant answer).

1. in dwelling
2. in yard
3. outside yard

FOOD ACCESSIBILITY

A1.1 How much of your harvest is used for food for household meals? (Circle the relevant answer).

- | | | | | | |
|---|-------------|--------|---------|-------|-------------------|
| 1 | Vegetables: | 1=Some | 2= Most | 3=All | 4= Nothing at all |
| 2 | Fruit: | 1=Some | 2= Most | 3=All | 4= Nothing at all |
| 3 | Crops: | 1=Some | 2= Most | 3=All | 4= Nothing at all |
| 4 | Livestock | 1=Some | 2= Most | 3=All | 4= Nothing at all |

A2.1 Do you produce enough to eat from the garden for a year? YES=1 NO=0 (Circle the relevant answer).

A.2.2 If YES, for how long will you be able to produce?

- 1 Few weeks
- 2 Few months
- 3 Half a year
- 4 Full year
- 5 Other, specify.....

A.2.3 If NO, what are the reasons? Do NOT answer if you have answered 1.2.1) (Circle relevant answer).

1. Not enough land in the garden
2. Not enough water/Water too expensive
3. Don't have seed
4. Don't have manure or compost
5. Don't have fertilizer and pesticides
6. Don't have tools or equipment
7. Not healthy, ill, age
8. Other, specify.....

A3 What is your main source of income? (Circle the relevant answer).

- 1 Wages and salaries from formal employment
- 2 Self-employment (including home enterprise, street vendors)
- 3 Casual employment (agriculture and non-agriculture)
- 4 Crop, garden production sales and livestock sales
- 5 Sale of assets
- 6 Land/flats/shacks/equipment rental
- 7 Old age pension or social grant
- 8 Domestic work
- 9 Other specify.....

A4. How much money do you spend on food WEEKLY for the household? (Circle the relevant answer).

- 1. R0-R50
- 2 R 51-R100
- 3 R101-R 200
- 4 R 201-R300
- 5 R301-R500
- 6 R501-R700
- 7 R 701-R1000
- 8 R1000- and more
- 9 Don't know
- 10 Other, Specify.....

A5. What are your main reasons for producing food? (Circle the relevant answer/s).

- 1 Consumption by family members
- 2 To give to neighbours, or exchange vegetables
- 3 Give as gifts
- 4 To sell
- 5 Barter or exchange (for other goods such as clothes, household equipment)
- 6 Health reasons
- 7 Other, specify.....

A6. If you DO NOT have vegetables in the garden, where do you get them? (Circle the relevant answer).

- 1 Shops
- 2 Vendors
- 3 Local farmers
- 4 Neighbours/People with gardens
- 5 Family in rural area
- 6 Other, specify.....

A7 If you do not have fruits in the garden, where do you get them?
(Circle the relevant answer).

- 1 Shops
- 2 Vendors
- 3 Local farmers
- 4 Neighbours / People with gardens
- 5 Family in rural area
- 6 Other, specify.....

A8. If you have to buy food, what form of transport do you use?
(Circle the relevant answer).

- 1 By foot
- 2 Bicycle
- 3 Public transport
- 4 Taxi
- 5 Own car
- 6 Other, specify.....

A9.1 Do you keep food for future use? (Circle the relevant answer).
1=Yes 0= No

IF NO, skip to question 10.

A9.2 If yes, which methods do you mostly use? (Circle the relevant answer).

- 1 Just keeping in a dry place, in bags or shelf
- 2 Sun drying
- 3 Canning
- 4 Freezing
- 5 Refrigeration
- 6 Other, specify.....

A10. Do you eat more than one kind of white starchy vegetable a day?
Select only one by circling the right answer.

- 0 Do not eat white starchy vegetables (None)
- 1 Rarely or never (0-1 days of a week)
- 2 Sometimes (2-3 days of a week)
- 3 Often (4-5 days of a week)
- 4 Usually or always (6-7 days of a week)

A11. Do you eat more than one kind of vegetable a day?
Select only one by circling the right answer.

- 0 Do not eat vegetables (None)
- 1 Rarely or never (0-1 days of a week)
- 2 Sometimes (2-3 days of a week)
- 3 Often (4-5 days of a week)
- 4 Usually or always (6 - 7 days of a week)

A12 Do you eat one or more of the vegetables with the main meal per day, yellow or green vegetables.

Select only one by circling the right answer.

- 0 Do not eat with main meal (None)
- 1 Rarely or never (0-1 days of a week)
- 2 Sometimes (2-3 days of a week)
- 3 Often (4-5 days of a week)
- 4 Usually or always (6-7 days of a week)

A13. Do you eat more than one kind of fruit daily?

Select only one by circling the right answer.

- 0 Do not eat fruit (None)
- 1 Rarely or never (0-1 days of a week)
- 2 Sometimes (2-3 days of a week)
- 3 Often (4-5 days of a week)
- 4 Usually or always (6-7 days of a week)

A14. During the past week did you have citrus or fruit juice?

(Circle the relevant answer).

1 = Yes 0 = No

A15. Do you eat fruits or vegetables as snacks?

Select only one by circling the right answer:

- 0 Do not eat as snacks (None)
- 1 Rarely or never (0-1 days of a week)
- 2 Sometimes (2-3 days of a week)
- 3 Often (4-5 days of a week)
- 4 Usually or always (6-7 days of a week)

Where do you get them from

INCOME AND EXPENDITURE

(Circle the relevant answer at each question)

M1.

- 1. Do you receive money on a monthly basis? 1 = Yes 0 = No
- 2. Is there any form of income you receive? 1 = Yes 0 = No
- 3. Do you have enough money in the first two weeks of the month? 1 = Yes 0 = No
- 4. Are you short of money in the last two weeks of the month? 1 = Yes 0 = No
- 5. I do not know how much I spend on food. 1 = Yes 0 = No

M2. How much money is spent on food as per week or per month (Refer to column 1 below).

STEP 1: Please indicate income in the *income column* by ticking the relevant amount (monthly/weekly)

STEP 2: Please indicate how much of the money in Rands earned is spent *on food in the amount earned column* as per monthly in the table below. Tick the relevant answers next to the amount.

	Income		Money spent on food
<i>Income per week - Only those received per week e.g. Vendor,</i>			
R0-R50			
R51-R100			
R101-150			
R151-200			
R201-250			
R251-300			
R301-R350			
R351-R400			
Over R400			
<i>Income monthly – Only those received monthly-e.g. Monthly</i>			
R0-R200			
R201-R400			
R401-600			
R601-800			
R801-R1000			
R1000-R1200			
Other, indicate how much			

M3. Which sources give you the above income, mark if monthly or sometimes?

Sources of income	Monthly	Sometimes
Wages and salaries from formal employment		
Self-employment including income generation		
Casual employment (agric and non-agricultural)		
Sale of assets / equipment		
Rental of land, room, car lifts or equipment		
Grants: child, old age, disability		
Domestic work		
Remittances		
Contribution from children/ family / friends		
Any other.....		

M3 First, observe. Then ask the interviewee which equipment she/he owns. If you can or cannot see it in the household, avoid asking sensitive questions. If you are missing items and the interviewee is hesitant to respond, you can probe for responses. Try to ask questions as indicated but in a conversational manner. Answer true with Yes=1 and No =0 for the following questions

Question	Answer Yes=1 No=2	Weighting if True
1. I have the following in my household :		
<input type="checkbox"/> TV set		
<input type="checkbox"/> Swimming pool		
<input type="checkbox"/> DVD player/ Blue Ray Player		
<input type="checkbox"/> Pay TV (M-Net/DStv/Top TV) subscription		
<input type="checkbox"/> Air conditioner (exl. fans)		
<input type="checkbox"/> Computer /Desktop/ Laptop		
<input type="checkbox"/> Vacuum cleaner/floor polisher		
<input type="checkbox"/> Dishwashing machine		
<input type="checkbox"/> Washing machine		
<input type="checkbox"/> Tumble dryer		
<input type="checkbox"/> Home telephone (excluding a cell)		
<input type="checkbox"/> Deep freezer –free standing		
<input type="checkbox"/> Refrigerator or combined fridge/freezer		
<input type="checkbox"/> Electric stove		
<input type="checkbox"/> Microwave oven		
<input type="checkbox"/> Built-in kitchen sink		
<input type="checkbox"/> Home security service		
<input type="checkbox"/> 3 or more cell phones in the household		
<input type="checkbox"/> Hi-fi/Music Centre		
<input type="checkbox"/> Home theatre system		
2. I have the following amenities in my home or on the plot:		
<input type="checkbox"/> Tap water in house/on plot		
<input type="checkbox"/> Hot running water from a geyser		
<input type="checkbox"/> Flush toilet in/outside house		
3. There is a motor vehicle in our household		
4. I am a metropolitan dweller		
5. I live in a house, cluster or town house		
ALL TRUE TOTAL		
6. I live in a rural area outside Western Cape		
7. There are no radios, or only one radio (excluding car radios) in my household		
8. There is no domestic worker or household helper in our household (incl. both live-in & part time domestics and gardeners)		

(Source: LSM® score: Updated AMPS July 2013- June 2014).

APPENDIX B: FOCUS GROUP DISCUSSION OUTLINE

Participants: PHFS students (divided into three groups)

The purpose of this study is to investigate access and practices which lead to an increase in a household's access to nutritious food through its participation in the Household Food Security (HFS) Short Learning Programme offered by the University of South Africa to students who are registered for the course. The results of the interview will be used for study purposes.

Key questions:

Household and gardens

- The practices used to promote diversity in household diets. (Such as ways in which food is selected, prepared and served in the households).
- Factors (challenges, strengths and weaknesses) which affect nutritious food accessibility – (For example, access to land for cultivation, shops and transportation).
- What do you normally plant in your home garden and what do you eat from the crops or plants harvested?
- New things done in the garden. Has the information from the programme helped you and how?
- Challenges pertaining to home gardens and inputs/resources.
- What prevents households/individuals from growing or producing crops they normally produce?
- Is there anything else that is a challenge to the households?

Household Food Security Programme

- How do the learning activities (expectations) and challenges hinder the learning activities?
- Students experiences with households during the practical work
- Is the study module applicable?
- Factors (challenges, strengths and weaknesses) that you come across during the learning activity.
- Opportunities or threats of the programme (will you continue working with the households after completion of the SLP?)

APPENDIX C: CONSENT FORM

TITLE OF RESEARCH PROJECT: “Assessing the access to nutritious food by household’s participating in the Household Food Security Short Learning Programme in Dysselsdorp, Western Cape Province”.

Dear Mr/Mrs/Miss/Ms _____ Date.....

NATURE AND PURPOSE OF THE STUDY

The purpose of the study is to investigate access and practices which lead to an increase in a household’s access to nutritious food through its participation in the Household Food Security (HFS) Short Learning Programme offered by the University of South Africa to students who are registered for the course. The students are working with households in Dysselsdorp in the Western Cape Province of South Africa. The study makes use of interviews and focus group discussions to gather information from both students and participating households.

RESEARCH PROCESS

The study requires participation of students and households in interviews where a semi-structured baseline questionnaire will be administered. The questionnaire consists of five sections as follows: the socio-demographic, food utilization, food availability, food accessibility, and the living standards/expenditure using the Living Standard Measurement (LSM Score).

- Participants of focus group interviews include students and the promoter.
- Focus group interviews will be led by a facilitator (researcher)
- The discussion will take about 15-20 minutes per group.
- There are no right or wrong answers and all opinions will be valued in the discussion.

NOTIFICATION THAT PHOTOGRAPHIC MATERIAL WILL BE USED AND TAPE RECORDINGS MADE DURING THE DATA GATHERING SESSION.

Your attention is drawn to the fact that the focus group discussion will be tape recorded to ensure that valuable information elicited during the interview is captured and that the context of the information can be reviewed in detail. Following the focus group discussion, the recorded material will be transcribed.

CONFIDENTIALITY

The opinions from the focus group participants are viewed as strictly confidential, and only members of the research team will have access to the information. Data published in dissertations and journals will not contain any information that would lead to the identification of focus group members.

WITHDRAWAL CLAUSE

Kindly note that you may withdraw from the interviews and focus group discussion at any time. Therefore, participation is voluntary.

POTENTIAL BENEFITS OF THE STUDY

Promoting food security in SA is a challenge and this study seeks to identify issues that may be hindering the successful implementation of the programme, as well as identifying factors that can contribute to its success.

This study seeks to contribute to the sustainability and improvement of the living conditions of individuals, households and communities, as well as encourage economic growth in the country. The end results will be used to monitor and evaluate the process so as to improve the programme and ensure that such projects are meaningful to participating students and household livelihoods. Issues that hinder successful implementation will be identified, addressed and recommendations made for the development of the programme.

CONTACT INFORMATION

If you have any questions concerning the study, you may contact my research supervisor, Prof LL Maliwichi at the University of Venda, Department of Consumer Sciences. Telephone number: 015 9628626.

CONSENT

I, the undersigned, (Full name) have read the above information relating to the project and have also listened to the verbal version, and I declare that I understand it. I have been afforded an opportunity to discuss relevant aspects of the project with the project leader, and hereby declare that I agree to participate voluntarily in the project.

I indemnify the university and any employee or student of the university against any liability that I may incur during the course of the project.

I further undertake to make no claim against the university in respect of damages to my person or reputation that may be incurred as a result of the project/trial or through the fault of other participants, unless resulting from negligence on the part of the university, its employees or students.

I have received a signed copy of this consent form.

Signature of participant:

Signed at on

WITNESSES

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