An investigation into the contribution of food coping strategies to food availability and dietary intake of adult women living in farm worker households on Oranje farm in the Fouriesburg district (RSA)

MATLALE IRENE MOOPA

JANUARY 2010

UNIVERSITEIT VAN PRETORIA
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An investigation into the contribution of food coping strategies to food availability and dietary intake of adult women living in farm worker households on Oranje farm in the Fouriesburg District (RSA)

by

Matlale Irene Moopa

Essay handed in the fulfilment of the requirements for the degree
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Study leader: Dr R Kruger
Co-Study Leader: Prof HC Schönfeldt

I will like to dedicate this work to the memory of my beloved mother Moyahabo Johannah Mokgawa Mphahlele who unfortunately did not live to see this work which resulted from her gift of many years of love and care to me.

To her - thank you and I love you.

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DECLARATION

I, **Matlale Irene Moopa** hereby declare that the dissertation for the **Masters in Consumer Science** degree at the University of Pretoria, hereby submitted by me, has not previously been submitted for a degree at this or any other university and that it is my own work in design and execution and that all reference material contained herein has been duly acknowledged.

MATLALE IRENE MOOPA

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ABSTRACT

An investigation into the contribution of food coping strategies to food availability and dietary intake of adult women living in the farm worker households on Oranje farm in the Fouriesburg district (RSA)

by

MATLALE IRENE MOOPA

Study Leader: **Dr R Kruger**
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This study is aimed at investigating the different food copying strategies used during food stress and[r1] how they relate to the dietary intake of women in farm worker households on Orange farm in the Fouriesburg district. Food copying strategies refer to plans of action adopted by a household to fulfil a specific goal, that is, to acquire enough food needed to live an active and a healthy life. Not all the strategies will provide positive health outcomes. The type of food coping strategy to employ is guided by the availability of resources.

The study sample consisted of adult woman (18 – 55 years) responsible for organising the resources at their disposal to limit the effect of a limited food supply. Data was gathered with a structured questionnaire concerning demographic information, quantitative 24-hour dietary recall to assess their food intake and a food coping strategy index (FCSI) score to assess the food security level. Data on food coping strategies was collected over five seasons in one calendar year: early summer, late summer, autumn, spring and winter. The food copying strategies were ranked and weighted by measuring their frequency and severity, and then combined into a single score that is used to measure a household's food security status.

Food copying strategies that are mostly employed by this community to ensure adequate food intake or to improve the dietary variety of their staple rich monotonous diet are relying on the less preferred or cheap food, buying food on credit, gathering wild food, consumption of seed stock and reduction of portion size. The study reveals that they are a low socio-economic community that employ food coping strategies on a regular basis through all seasons to cope with poor food availability. Their staple rich monotonous diet cannot provide sufficient micronutrient intake on a daily basis.

To create an efficient and effective impact on the nutritional status of the community, more use of food coping strategies can be achieved by encouraging the households to:

- Practice food bartering,
- Learn various methods of preserving fruits and vegetables when they are in abundance,
- Gather the leftovers from the fields after harvesting,
- Hunt for edible insects that are culturally acceptable to improve their protein intake,
- Purchase non-perishables, such as tinned fish and powdered milk, for those who are without cold storage facilities, and
- Create a fishing opportunity by filling the dam with water during dry seasons.

Key words: Household food security, food coping strategies, food availability, dietary intake, women of childbearing age, farm workers, low income.

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND AND SETTING

In per capita terms South Africa is an upper middle income country (May, 2000:54). This rating conceals the fact that a very large number of people are extremely poor, while a much smaller number are wealthy. This statement is confirmed by May (2000:54) by stating that "most South African households experience outright poverty or vulnerability to poverty". The experience of more than 14 million people or about 35% of the South African population is that they are food insecure and categorised as being poor (Lemke, 2005:845; de Klerk, Drimie, Aliber, Mini, Mokoena, Randel, Modiselle, Roberts, Vogel, de Swart and Kirsten, 2004:03). The worst affected are the rural households, especially those situated within the former homelands (Kgaphola and Boshoff, 2002:65). Estimates suggest that approximately 43% of households suffer from food poverty (Rose and Charlton, 2001:384). Poverty is a state of being poor, that is, when physiological human needs are not adequately met due to the fact that the available amount of money is not enough to purchase a basic nutritional diet (De Rose, Messer and Millmann, 1998:02).

South Africans perceive poverty as alienation from the community, food insecurity, crowded homes, lack of jobs that pay adequately and/or insecure and fragmentation of the family (Kruger, Lemke, Phometsi, van't Riet, Pienaar and Kotze, 2005:833; Department of Agriculture of the Republic of South Africa, 2002:23) Therefore, poverty is multi-dimensional and can be presented from economical, social and political perspectives. Economical poverty is understood as the exclusion from the labour market and opportunities to earn an income, therefore, resulting in a lack of resources such as land and food, infrastructure and productive resources, as well as no or minimal access to facilities such as credit and production assets. The social perspective explains a lack of access to basic provisions, such as health, education, recreation, sanitation and shelter. From a political perspective, poverty refers to a lack of power by people to make decisions and take control of their lives (Herholdt, *s.a.*:95; Department of Agriculture of the Republic of South Africa, 2002:17) For example, unemployed women mainly depend on the income of their male partners, which influences the allocation of resources within the household and probably results in the limited

decision making power of women. Male dominance in South Africa is still very prevalent in the majority of conjugal relationships and there are high levels of conflict within households, mainly about income and other resources, thereby impacting on the household nutrition security (Lemke, 2005:846).

Food is a basic human need that is important for survival, growth for children, health and general well being. Without an adequate supply of food and the nutrients it contains, a human being cannot grow and develop optimally. Thus, Hendricks (2002: 51) state that "freedom from hunger is the most fundamental human right" (that can only be attained if an individual is food secure). Food security forms part of Section 27 of the Constitutional Rights in South Africa. According to the Bill of Rights, every citizen has the right to have access to sufficient food and water (Department of Agriculture of the Republic of South Africa, 2002:05). Irrespective of the fact that the right to access sufficient food is one of the most consistently enshrined aspects in international human rights law, hunger and food insecurity continue to be a norm in many households and communities. Hunger is the painful or uneasy sensation caused by an involuntary lack of access to food, rather than a lack of food (Bickel, Nord, Price, Hamilton and Cook, 2000:06).

Poverty translates into hunger which is the absence of the means of satisfying the most basic need for bodily sustenance. Thus Labadarios, Swart, Maunder, Kruger, Gericke, Kuzwayo, Ntsie, Steyn, Schloss, Dhansay, Jooste, Dannhauser, Nel, Molefe and Kotze (2008:259) "define hunger as the mental and physical condition that comes from not eating enough food, due to insufficient family, community and economic resources. Poverty and social inequalities are the major causes of food insecurity. Sustainable progress in poverty eradication is thus critical to improve access to food. Poverty, hunger and food insecurity are the most pressing social issues globally. In 1996, at the World Food Summit Plan of Action, the world leaders pledged to halve poverty and the number of food insecurity by 2015 (Clover, 2003:08; Department of Agriculture of the Republic of South Africa, 2002:06). These commitments were re-affirmed at the 2002 World Food Summit (Lemke, 2005:845). The Rome Declaration on World Food Security that formed part of the World Food Summit Plan of Action, concerted the action of directing resources to those most in need, in order to raise their productive capacities, improve their social opportunities, and increase their access to food in a sustainable way (Thompson, *s.a.*:23). For example, interventions such as community gardening are designed to improve household access to variety of food. Community gardening forms part of the South African Department of Health Integrated Nutrition Programme (Rose and Charlton, 2001:383). Furthermore, the South African Government is continually increasing the budget for social programmes, such as school

feeding schemes and free health services for pregnant and lactating women (Department of Agriculture of the Republic of South Africa, 2002:05).

The Integrated Food Security Strategy (IFSS) adopted the pledge that was made by the world leaders as its guiding vision to attain universal physical, social and economical access to sufficient, safe and nutritious food for all South Africans to meet their dietary requirements (de Klerk *et al*, 2004:25). They pursued this goal by setting and implementing the principle of creating an economic environment that is pro-poor and that enables food insecure households to insert themselves into the economic stream (Department of Agriculture of the Republic of South Africa, 2002:131). The IFSS is a strategy designed to increase food security in order to address hunger and malnutrition that have reached a frightening level. Since food security is a multidisciplinary problem, the IFSS encompasses the national and provincial governments, public agencies, universities and community-based associations with the Minister of Agriculture and Land Affairs (MALA) taking the lead (Department of Agriculture of the Republic of South Africa, 2002:11). The International Food Policy Research Institution (IFPRI) formulated a 2020 vision policy for food, agriculture and environment. They drew up a number of objectives that included reducing the number of the absolute poor by at least half in order to greatly reduce chronic food insecurity and eliminate chronic malnutrition of children (Badiance and Delgade, 1995:05).

All the stakeholders that took part in planning how to make communities food secure hoped to reach their goals since, generally speaking, there is sufficient food in the world, but due to inappropriate and unjust policies, many people still go hungry each day (Sayed, 2002:01). According to the Rome Declaration on World Food Security (1996:01), “food supplies have increased substantially, but constraints on access to food and continuing inadequacy of household and national incomes to purchase food, instability to supply and demand, control of resources as well as natural and man-made disasters, prevent basic food needs from being fulfilled.’’ Hence, Thompson (*s.a.*:07) states that “one cannot assume that, once national food security is met, individuals and households will automatically experience food security’’. Africa’s current food emergencies are the results of a combination of problems that ranges from drought and adverse weather patterns, civil conflicts to political economic crises, HIV/AIDS and poor policy decisions (Clover, 2003:09). Thus Zvomuya (2008:45) further state that’’ the cause of the food crisis is not low production in itself but rather a lack of linkage between production and consumption centres’’. National food security refers to the total amount of food available in a country in relation to its total population (Kgaphola and Boshoff, 2002:65).The available data indicates household food insecurity as one of the underlying causes of malnutrition and death (UNICEF, 1991:39). Household food insecurity exists whenever a household is unable to access (procure and produce) nutritionally adequate food

at all times for all household members for a healthy and productive life (USAID as quoted by Hoddinott and Yohannes, 2002:03; Sayed, 2002:02). According to de Klerk *et al* (2004:28) ''food insecurity is not only a failure of agriculture to produce sufficient food at the national level, but instead a failure to guarantee access to sufficient food at the household level.''

Based on the explanation of food insecurity, it is clear that families who experience food insecurity live on a diet that is inadequate in terms of quality, quantity and variety. The majority of South African households live in poverty with only a limited variety of foods (mainly staples) available in the home (Lemke, 2001:211). Normally, such a diet does not meet the nutritional needs (physiological requirements) of a human being during the different stages of life, for example, during infancy, childhood, the adolescent years, during pregnancy and in old age (elderly), as it is adequate only in terms of quantity (that is, the total energy intake), but lacks adequate quality and a variety of micronutrients (vitamins and minerals) (Sayed, 2002:04). These micronutrients are essential to protect people of all ages from infection, as well as to help produce enzymes, hormones and other substances that are required to regulate biological processes leading to growth, activity, development and the functioning of the immune and reproductive systems (Bellamy, 1998:14; Savage King and Burgess, 1995:209). Thus Adams, Grummer-Strawn and Chavez (2003:1070) further state that "food insecurity, the limited or uncertain availability of nutritionally adequate and safe foods, may be associated with eating disorders and a poor diet, potentially increasing the risk of obesity and other health problems".

Sufficient total intake of macronutrients such as proteins, fats and carbohydrates, result in malnutrition if not coupled with an adequate intake of micronutrients such as iron, zinc, iodine and vitamin A, as well as essential fatty acids. This statement supports the fact that malnutrition is not only the result of a deficiency of protein and energy, but also of an inadequate dietary intake of vital minerals and vitamins (Bellamy, 1998:14). Lalthapersad-Pillay (2002:40) and Baker, Martin and Piwoz, (1996:11) define malnutrition as "a state in which the physical function of an individual is impaired to the point where she or he can no longer maintain adequate performance in such processes as growth, pregnancy, lactation, physical work, resisting and recovering from diseases." Since malnutrition has the greatest impact on the rapid growing stage, it is deemed very important to see to it that infants, children and women of childbearing age are properly taken care of as far as food supply is concerned, not forgetting to address the workload and time constraints of the women (Bellamy, 1998:21). Department of Health (2002:01) states that, "sound nutrition involves more than just the availability of food or the consumption of a certain amount of energy (kJ), proteins and micronutrients per day." Sound nutrition depends upon the nutrition security

status which implies food security. Security refers to having food and good nutrition on an ongoing basis (Department of Health, 2002:01).

1.2 MOTIVATION

Inadequate nutrient intake is often caused by household food insecurity defined as a household's lack of access to amounts of food of the right quality to satisfy the dietary needs of all its members throughout the year (Rose and Charlton, 2001:383). Women and girls, as the primary food producers and providers, struggle and devise different means (strategies) to put food on the table to keep the stomachs of the household members full (Maxwell, Ahiadeke, Levin, Amar-Klemesu, Zakariah and Lamptey, 1999:414). In this context, strategies are those plans of action adopted by a household to fulfil a specific goal, that being, to acquire enough food needed to live an active and a healthy life. Not all the strategies will provide positive health outcomes. For example, if one employs a strategy such as skipping meals for the whole day, it will result in adverse health conditions since this type of a strategy is a more severe means of dealing with food insufficiency (Maxwell, 1996:295).

The focus of this study is on adult women as statistics on health, nutrition, education and labour force participation show that they are severely impoverished (Lalthapersad-Pillay, 2002:39). Women are the second most vulnerable group of the population (Labadarios *et al, 2008:253).* In this study an adult woman is a female between the age of 18 and 55 years who is responsible for food in the household and subsequently for applying the various food coping strategies in order to survive and have enough food on the table. This scenario of women being the most vulnerable group is influenced by gender inequality that effects the livelihood assets, increases vulnerability and limits women's attainment of anticipated or expected livelihood outcomes including food security (Hendricks 2002:52). For example, women spend long hours on the strenuous but unpaid work involved in accessing alternative sources and utilising efficient means of satisfying the basic needs of household members (Bundlender, 1999:213). These hardships that women are faced with on a day-to-day basis render them vulnerable to a lack of food. They sometimes skip meals, thereby compromising their nutritional status, which is detrimental to their health (UNICEF, 1991:51). Women's high/low energy output can aggravate their poor nutritional status, increasing their morbidity and resulting in premature mortality (Nti, Inkumsah and Fleischer, 1999:168). From girlhood to womanhood, females of many societies are fed last and least, irrespective of the hard and long hours of physical labour that they are always engaged in (De Rose *et al,* 1998:136; Kgaphola and Viljoen, 2004:19). For example, in Nepal, in the upper caste structure during

the part of the year when food is scarce, women eat maize, bread and salt only twice a week in order not to starve (International Fund for Agricultural Department (IFAD), 1998:02). Gender disparity is a global phenomenon, for example, 70% of Ghanaian women have only two meals a day due to a lack of time, since they need to leave home early and have a high workload (Nti *et al*, 1999:165).

During lean periods of the year, women compromise their health for other household members, by reducing their food intake (IFAD, 1998:02). This study does not overlook the fact that sound nutrition is a basic human right, enshrined in the South African Constitution through the Bill of Rights (Department of Health, 2002:01). It also, recognises the fact that women spend most of their time on various activities, for example, Nti *et al* (1999:165) state that "Ghanaian women have seven roles to play, namely maternal, domestic, conjugal, related to kin, occupational, individual and related to the community."

Therefore, this study is about assessing the food coping strategies used by women of childbearing age living in farm worker households, as well as assessing the impact of these strategies on their nutritional status. This group was chosen since the available data indicates that amongst the total South African population that is food insecure within the household, women and children are the most vulnerable, especially those living on farms (Department of Agriculture of the Republic of South Africa, 2002:22). The available data outline the contributing factors to the women and children's vulnerability to food insecurity status as: 1) one third of all the South African households being female-headed are considerably poorer than male-headed households since almost half of the former group earns less than a R1 000,00 per month (Department of Agriculture of the Republic of South Africa, 2002:23) and 2) a high percentage of employed farm residents are male, thus putting them in a better position in terms of control of resources (Lemke, 2005:845).

1.3 JUSTIFICATION OF THE STUDY

Food insecure or poor families employ food coping strategies to ensure adequate food intake or to improve the dietary variety of their staple-rich, monotonous diets. This study forms part of a larger project, "Developing a food based model to improve household food security on commercial farms in South Africa", involving post-graduate students from the department of Consumer Science at the University of Pretoria (UP). This project has been implemented with the support of the Centre of Nutrition, UP. The research problem of the larger focus group project (Green, 2005:07) was formulated in a question format as follows: "How can

household food security on commercial farms be improved through the implementation and evaluation of community-based nutrition programs and other supplementary interventions?"

In order to fulfil the particular aim of addressing household food security on commercial farms in South Africa, baseline data from a selected community have been obtained and analysed, specifically with the intention of identifying needs and problems concerning various components of household food security that may precipitate in rural communities. Identified nutritional needs and nutrition/food related problems are used to focus on the design and implementation of related food-based programmes. Evaluative research was conducted by Green (2005) in terms of process and outcome, and impacting factors and the results were used to construct a generic model or guideline. This model is of significance to understand the relevant factors that should be considered when addressing household food insecurity, in order to contribute to the improvement of health, specifically with reference to children and women of childbearing age. The baseline data is used to design effective and sustainable interventions on commercial farms in South Africa (Green, 2005:04).

The research aim stated for this study is, therefore, to identify the different food coping strategies used by women living in farm worker households on Oranje farm in the Fouriesburg district, and to provide an understanding of how the food coping strategies employed during food shortage can impact their dietary intake.

The problem of household food insecurity is investigated from the perspective of the United Nations Children's Fund (UNICEF) nutrition strategy and analytical framework on the determinants of poor nutritional status (Maxwell, 1996:298). The UNICEF framework is relevant to the problem of food insecurity as it outlines the impact of the factors that encompass food insecurity. The women living in farm worker households were interviewed during all seasons in one year to assess the food availability in each season, as well as throughout the year. The food coping strategies were then recorded and used as a basis to determine their food insecurity during these periods. A food coping score was calculated to facilitate the process and a 24-hour dietary recall questionnaire was used to enhance understanding of the food security status of the households.

1.4 STRUCTURE OF THE ESSAY

The essay is presented as follows:

Chapter 1: Background and setting

Chapter 2: Theoretical framework and supporting literature

Chapter 3: Research Methodology (Methods and procedure)

Chapter 4: Results and discussion

Chapter 5: Conclusion and recommendations

CHAPTER 2

THEORETICAL FRAMEWORK AND SUPPORTING LITERATURE

2.1 INTRODUCTION

Good nutrition is critical for the well being of any society and to each individual within that society. From a nutritional point of view, food is essential, since it:

- acts as a source of energy,
- provides the chemical raw materials that promote growth, repair and maintain body tissues, and
- contains chemicals that serve to regulate and facilitate vital processes within the body (Gibney, Vorster and Kok, 2002:09).

It is important that all people at all times should have access to food. Hence, the nutritional goals, such as the reduction of iron deficiency anaemia (IDA) in women of childbearing age and the improvement of birth weight, are important for many health conscious institutions, such as the National Food Consumption Survey (NFCS) and the National Iodine Deficiency Disorder Survey (IDD) (Department of Health, 2004:03). A semi-autonomous body known as the Tanzania Food and Nutrition Centre (TFNC), functioning under the Tanzanian Ministry of Health, initiated a new nutrition strategy to improve the nutritional status of its community (Kavishe, 1995:369). This nutrition strategy is composed of a conceptual framework regarding causes of malnutrition and death, and a fundamental nutrition process known as the Triple A cycle (Figure 2.1) (Kavishe, 1995:370). The Triple A model approach is a three stage planning cycle that includes assessment of the problem, analysing the causes of the problem and taking action in resolving the problem (De Rose *et al*, 1998:26).

This “new strategy” was prompted by the fact that the previous policies were not sufficient enough to impact on the community’s nutritional status, especially with regard to children and women. This became evident when at the end of the 1970’s, after all the measures were employed to improve the nutritional status, young children still showed a range of clinical and non-clinical symptoms that were an indication of an inadequate intake of a specific nutrient or a combination of nutrients.

The Joint Nutrition Support Programme (JNSP) of the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) tested the new nutrition strategy by conducting a nutrition programme in the Iringa region of Tanzania (Kavishe, 1995:370). This community-based Nutrition Programme proved to be effective as severe and moderate malnutrition in young children was reduced from 6.3% to 1.8% and 56% to 38% respectively (Kavishe, 1995:370; UNICEF, 1991:38). The advantages of this strategy are that it views:

- good nutrition as a basic human right,
- nutrition not as a sectoral activity, but as the manifestation of social processes, and
- that nutrition is community-based; focusing on the people whose nutritional status is an issue and their participation in the coping strategies which they develop as a response to their nutritional problem (UNICEF, 1991:38).

As South Africa is similar to other countries that experience the problem of a poor nutritional status, the South African Minister of Health appointed a Nutrition Committee in 1995 to develop a nutrition strategy that applies the basics of the UNICEF conceptual framework, as well as the Triple A Cycle (see Figure 2.1) (Department of Health, 2004:01). This committee came up with an integrated approach, namely the Integrated Nutrition Programme (INP), to replace the fragmented and mainly food-based approach of the past that did not address the country's nutrition problems sufficiently (Department of Health, 2004:01). This approach was used as a tool that guided the implementation of nutrition interventions such as the Primary School Nutrition Programme (PSNP) and the food fortification programme amongst others (Department of Health, 2002:15). In 1999, the National Food Consumption Survey presented poor nutritional status results that supported the results from the 1994 South African Vitamin A Consultancy Group Survey (SAVACG) (Department of Health, 2002:02). These results then persuaded the Department of Health and other sectors to redress the prevalence of micronutrient deficiencies that affect especially vulnerable groups such as children and women (Department of Health, 2004:03). In Mpumalanga, the Department of Agriculture, Conservation and Environment (DACE) set a target of promoting household security. The Division-Agricultural Home Economics was charged with the responsibility of facilitating this process by promoting the optimum utilisation of food by families to help them attain and sustain better health (Kgaphola and Boshoff, 2002:66). In Kwazulu_Natal production and consumption of dark green leafy vegetables (DGLV) was promoted to improve Vitamin A deficiency that is most prevalent and potentially serious forms of malnutrition after anaemia and goitre (Faber, van Jaarsveld and Laubscher[R2], 2007:407).

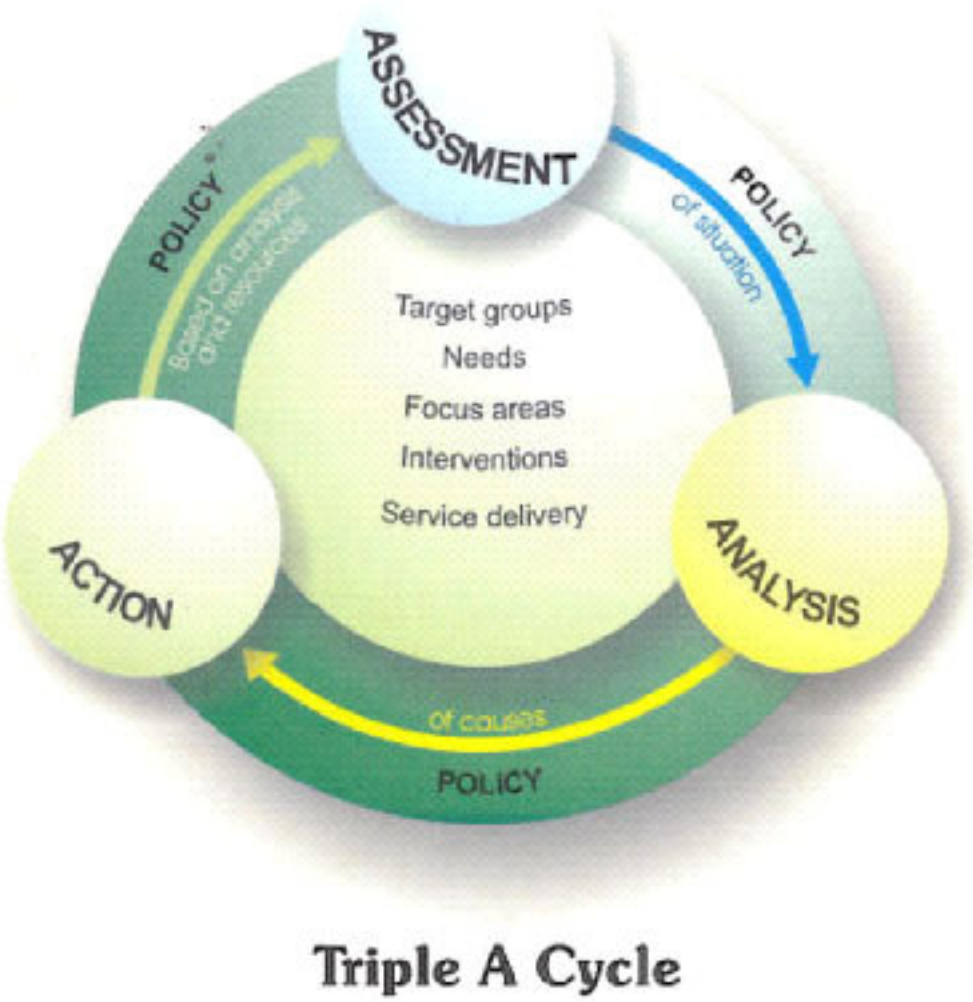

FIGURE 2.1: THE TRIPLE A CYCLE (Department of Health, 2004:01)

2.2 THE UNITED NATIONS CHILDREN'S FUND (UNICEF) CONCEPTUAL FRAMEWORK

The theoretical framework for this study is based on the UNICEF nutrition strategy. This nutrition strategy is composed of a conceptual framework proposed by UNICEF for addressing malnutrition and death as the outcome of interrelated, complex, basic, underlying and immediate causes (Figure 2.2) (Department of Health, 2004:01).

The available data indicates that a nutritional problem is usually a multi-faceted issue that is influenced by a diverse array of social, economic and environmental factors (Implementation Conference, 2002:01). Thus Hatting, Walsh, Bester, and Ogungtibeju, (2008:434) state that

"poor distribution of resources land or infrastructure and jobs that is influenced by political situations in South Africa led to migration of rural people to urban areas in order to find jobs and better living conditions". This scenario deprived the previous rural dwellers of the opportunity to obtain food by gathering wild food seasonally, fishing or hunting.

The UNICEF conceptual framework outlines three levels of the causes of malnutrition as basic, underlying and immediate causes and explains how they relate to one another (Figure 2.2) (Bellamy, 1998:23). The most immediate causes of malnutrition and death are associated with dietary inadequacies and diseases (particularly infectious diseases). These immediate causes are the consequences of the underlying causes of malnutrition and death that are known as:

- cluster 1: inadequate maternal and child care,
- cluster 2: insufficient services and an unhealthy environment,
- cluster 3: poor household food security, and
- cluster 4: lack of education and information (Department of Health, 2004:01).

These four problem clusters are, in turn, the consequences of certain basic or structural features of the cultural, ideological, social, political and economic environment that affects the availability and control of resources (UNICEF, 1991:39). These four clusters are the causes of malnutrition and death which emanate from the following aspects:

- lack of fundamental requirements,
- low literacy and mathematical levels,
- unmotivated labour resources, especially among younger household members and men's unsuccessful attempts to find urban employment,
- oppressive and demanding patriarchal environment,
- environmental degradation,
- nutrient losses associated with infections, and
- uneven distribution of resources such as money and land (Bellamy, 1998:31; Hendricks, 2002:53).

The above aspects might be regarded as the constraints for achieving the three food security dimensions, namely, food availability, access and utilisation.

FIGURE 2.2: THE CONCEPTUAL FRAMEWORK OF THE CAUSES OF MALNUTRITION AND DEATH (Department of Health, 2004:01)

2.2.1 Underlying causes that contribute to inadequate diet and death (immediate causes)

In this study only the underlying causes of malnutrition and death are discussed, namely, inadequate maternal care, insufficient health services and an unhealthy environment, lack of information and education, as well as poor household food security.

These four clusters are necessary conditions for adequate dietary intake, health and good nutrition (Bellamy, 1998:23). Dietary intake refers to the amount and type of food a person consumes (Brown, 2008:36). If the underlying causes are not properly catered for, the results may be inadequate food intake and disease (particularly infectious diseases). According to Mchlachlan and Kuswayo (1997:31), the underlying causes are multi-dimensional, but mostly result in a failure to meet basic human needs. Adequacy of each of these determinants is of importance for a positive nutritional and health outcome, but none is sufficient by itself. For instance, sufficient food in the absence of time and care for women is insufficient to improve their dietary intake (Lalthapersad-Pillay, 2002: 41). Thus Mahapa (2001:12) states that “food security involves much more than food”. This is demonstrated by the inter-dependency of the four clusters of the underlying causes of malnutrition and death, as shown in Figure 2.2. Food security also concerns other life aspects, as it is indicated that it includes different Government departments in all spheres. For example, in South Africa there is a core of Social Sector Cluster departments, such as the Department of Health, Social Development, Water affairs, Education, and Housing among others, that support the IFSS as well as the Millennium Development Goals of reducing the number of hungry, malnourished and food insecure people by half before 2015 (Department Agriculture of the Republic of South Africa, 2002:07; Labadarios et *al,* 2008:259)The duty of these leading departments is to create and lead programmes, such as land reform and food production among others, as well as to engage the public sector and the civil society in the war against household and national food insecurity (Department Agriculture of the Republic of South Africa, 2002:08).

2.2.1.1 Insufficient health services and an unhealthy environment

Some parts of urban and semi-urban areas are over-crowded due to industrialisation as people move from rural to urban areas. Migrants often settle in low potential areas (informal settlements) on the periphery of the cities. These locations are characterized by lack of access to curative and preventive health services that are affordable and of good quality as well as lack of infrastructure (Bellamy, 1998:25; Thompson, *s.a.*:11). These living conditions have consequences for the preparation, consumption and hygiene of food. Furthermore there is an occurrence of food intake shift from the traditional high carbohydrate low fat

intake to a diet associated with non-communicable diseases (MacIntyre, Kruger, Venter and Vorster 2002:239). Food security does not only concern food, hence it is important that all households and household members have access to fundamental requirements of good nutrition such as clean water, proper housing and sanitation, as well as energy. Inadequate health services frequently lead to ill health that decreases the nutritional impact of the available food (Bellamy, 1998:27). Health and nutrition are closely linked to diseases that contribute to malnutrition, thus causing an individual to be more susceptible to diseases (Tomkins and Watson, 1989:01). Infections can cause food deprivation since they reduce a person's appetite, thus reducing food intake, while increasing the need for energy and other nutrients. Infections increase nutrient losses, while the presence of diarrhoea, fever and vomiting cause malabsorption and altered metabolism (Mchlachlan and Kuzwayo, 1997:03; Helmuth and Johnson, 1988:221). This relationship is cyclical in that one factor exacerbates the other, as shown in Figure 2.3.

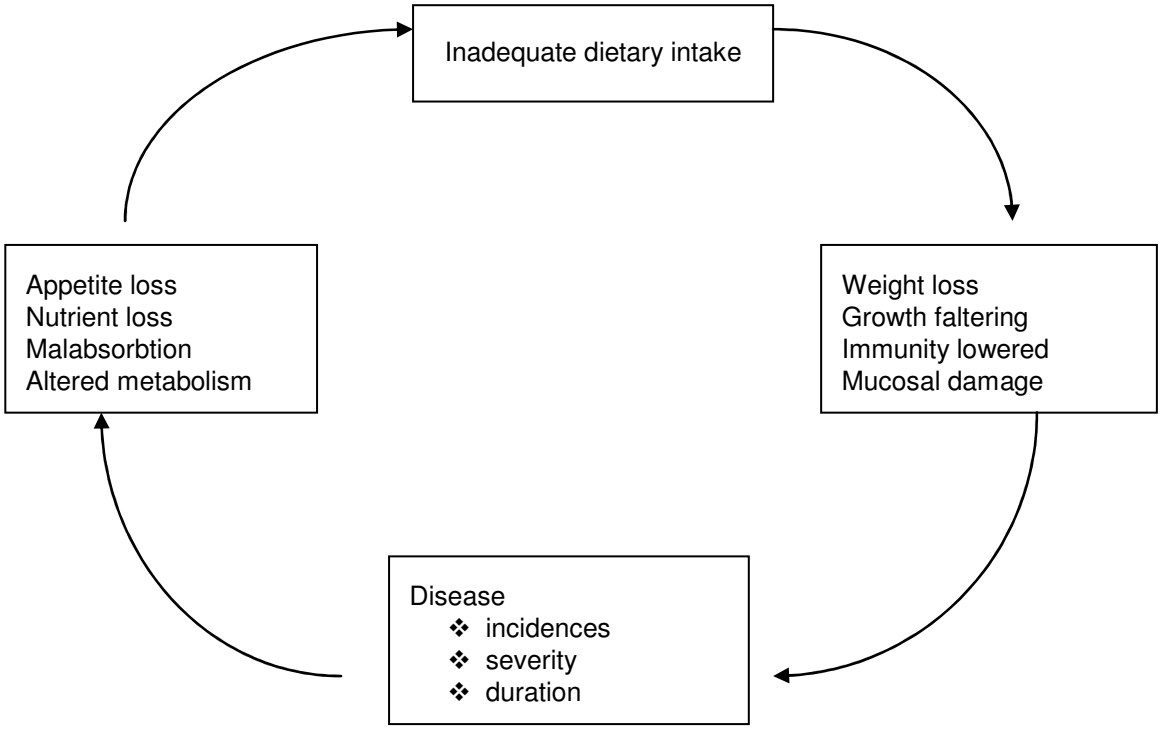

FIGURE 2.3: THE MALNUTRITION/INFECTION CYCLE (Tomkins and Watson, 1989:02)

The interaction of infection and malnutrition has an overwhelming impact on the health status of both the mother and the child, since it causes under-nutrition that can result in reproductive problems (Thompson, *s.a.*:12). Infections can also result in functional impairment in that it reduces the workers' (especially women) ability to do work either

directly, causing a consequent decline in labour productivity, or indirectly due to the need to care for sick family members.

People in rural areas seem to be more affected as HIV (Human immunodeficiency virus) and AIDS (Acquired immunodeficiency syndrome) infected urban migrants and orphaned children that return to rural homesteads depend on the low incomes of relatives. Migration back to rural areas is a long-term strategy that is commonly used to avert the problem of poverty (Maxwell, 1996:296). This practice further degrades the already marginal resources, since these migrants return home without an income. Instead, they enlarge the size of the household, increasing the demand in terms of food, care, as well as medical and funeral expenses (Hendricks, 2002:53). Since the caregiver does not have enough funds, these demands result in unequal distribution of the little money available. For instance, food and education are not well catered for. This unfortunate situation usually impacts on elderly women, since they are the ones who shoulder an additional responsibility for providing and caring for the sick and the orphans left behind by the deaths of their sons and daughters. This scenario compels women to allocate less time to household activities, such as food preparation and agricultural activities. In HIV-affected households, food production can be reduced by up to 60%, as more of the women's time and energy are spared for caring for the HIV/AIDS infected family members (Oxfam, 2002:04). According to Lemke (2005:845), AIDS kills the most productive and reproductive members of the society, thus increasing the number of dependent household members that will continually live with scarce or without sufficient means to meet the basic needs.

2.2.1.2 Lack of information and education

Human resources, such as education and health, need to be developed in order to raise the productivity of poor people and to improve their access to remunerative employment and productive resources (Bellamy, 199:19). Education is one of the most significant aspects in determining nutritional status, thus it needs to be improved together with increasing income and empowering women. The highest rates of diseases are observed among groups (women) with the highest poverty rates and the least education (Drewnowski, 2004:153). Labadarios *et al* (2008: 253) state that "the level of maternal education was found to be an important determinant of nutritional disorders among children"

Women perform different chores for their household's survival. Despite their pivotal role, their work is mostly unrecognised, devalued, unpaid and if paid they receive lower income (less than R1000.00 per month) which is linked with highest obesity rates (Drewnowski, 2004:154; Department of Agriculture of the Republic of South Africa 2002:23). The other contributing

factors to food insecurity, such as migration due to urbanisation, as well as diseases, inhibit parents to educate their children. For example, currently, informal socialisation, which is fundamentally the traditional customs relating to land utilisation, is inhibited by the prevalence of the HIV/AIDS pandemic, since parents die before they can teach their youth various activities, such as how to grow food as well as the importance of wild leafy vegetables and fruits (Oxfam, 2002:04). The transfer of knowledge and skills is disrupted, thus compromising the food security of the future generation.

2.2.1.3 Inadequate maternal care

Care refers to meeting physical, psychological and social needs of women through the provision of time, attention and support in the household and community (Engle *et al* as quoted by Mclachlan and Kuzwayo, 1997:23). Lack of care is but one among many contributing factors that result into maternal mortality. Maternal mortality rates (MMR) in poor countries have hardly changed in the last decade and may have risen in some 12 African countries, South Africa not being an exception (BJOG September Issue quoted by Moodley and Pattinson, 2006:vii). For example, South African MMR in all institutions based only per 100 000 live births in 2004 was 1633.9 (Moodley and Pattinson, 2006:224). In an effort to fight maternal death, the South African government instituted free maternity health care from around 1996 and the establishment of a National Committee on Confidential Enquiries (NCCEMD) in reporting maternal death (Moodley and Pattinson, 2006:vii). According to UNICEF (1991:31), “high maternal mortality is caused by malnutrition, inter-current infection and pregnancy related complications’’ (especially anaemia, toxaemia, haemorrhages and obstructed labour). In Eastern, Central and Southern Africa (ECSA) countries, these causes of maternal mortality are worsened by teenage pregnancy, taboos and other harmful traditional practices which are deeply rooted in socio-cultural attitudes towards girls and women. Gender relations play an important role in the general well being of members of South African households, especially for women and children (Lemke, 2005:846).

The deprivation of nutrition to women ranges across the economic, social and political arena. The low social status of women is reflected by their positions and activities in the society. Women are perceived as care-givers who have no social and economic power in their families. For this reason, they sometimes do not have control over how income is spent (even if they have earned it), the number of children they have, access to birth control or even the share of food they receive (Lalthapersad-Pillay, 2002:41).

Family planning (timing and spacing of births) is one of the seven elements of the strategy GOBIFFF that was advocated for children’s survival and development, as well as the

mother's health (Kibel and Wagstaff, 1995:124). The GOBIFFF acronym includes **g**rowth monitoring, **o**ral rehydration therapy, promotion of **b**reast feeding, universal child **i**mmunisation, **f**amily planning, **f**ood supplementation and **f**emale education (Kibel and Wagstaff, 1995:124). Spacing births at least two years apart would already reduce maternal mortality, young child morbidity and benefit everyone, from the family to the community, as well as the health care system (UNICEF, 1991:31). Birth spacing benefits the family in that:

- it protects the child from infectious diseases that could cause functional impairment or reduce the ability of the mother to do work indirectly due to the need to care for the child (Thompson, *s.a.*:12),
- it improves economic growth, since it enhances productivity,
- it improves the child's immediate health and well-being and later development that is usually negatively impacted by malnutrition (De Rose et al, 1998:12), and
- it saves money, because the child will not frequent health centres when ill (it lowers health costs).

Women's health is affected by various factors as outlined below:

- Heavy physical labour - Women perform heavy, physical labour that exerts a significant amount of physiological stress on them, which, in turn, affects their health and results in maternal malnutrition (Nti et al, 1999:165). Apart from being mothers, they also play a major role in food production, overall household upkeep and the maintenance of the extended family and community.
- Lack of food or food variety - Lack of food variety is a shortfall for an adequate and prudent diet. Thus, the South African Nutrition Working Group has developed a positive, practical, affordable, sustainable and culturally sensitive ten food-based dietary guidelines (FBDG's) to improve nutrition practices (Vorster, Love and Browne, 2001:S3). These FBDG's were adopted by the South African Department of Health (Department of Health, 2004:07). To enjoy a variety of foods is one of the ten guidelines that addresses the prevalence of a low micronutrient and energy intake, as well as an over-consumption of certain food that might increase the risk of chronic lifestyle diseases (Maunder, Matji and Hlatshwayo-Molea, 2001:S7).

2.2.1.4 Inadequate household food security in South Africa

The Integrated Nutrition Programme is a strategic health programme promoted by the Department of Health for solving nutritional problems such as malnutrition (under-nutrition and over-nutrition) in South Africa (Department of Health, 2004:01). This health programme is acquired by the Health Sector Strategic Framework (HSSF) to prevent and manage malnutrition, the major contributing factor to morbidity and mortality (Department of Health,

2004:04). The INP, as other interested stakeholders in curbing nutritional crisis, employs the UNICEF nutrition conceptual framework that outlines malnutrition as the outcome of an interrelated complex, basic, underlying and immediate cause through an ongoing process of assessment, analysis and action at all levels (Department of Health, 2002:01). It emphasises household food insecurity as one of the underlying causes of malnutrition and death in South Africa (Department of Health, 2004:01).

Household food security is a basic human need that is affected by the intra-household distribution of food, the quality of the family diet, as well as their cultural beliefs and customs (Department of Agriculture of the Republic of South Africa, 2002:11). Thus Thompson (*s.a.*:12) states that "access to food is not a sufficient condition for good nutrition and a healthy life, if a number of factors such as health and sanitation, environment and capacity of the household and the community to care for vulnerable members of the society are not addressed."

Household food security is about the household's ability to access (procure or produce) adequate food of good quality that provides energy, protein and micronutrients to ensure adequate food intake and to maintain a healthy life for all members of the family (Bellamy, 1998:23). This definition implies that constitutionally people are entitled to have nutritionally adequate and safe food and sufficient household resources to ensure their ability to acquire adequate, acceptable foods in socially acceptable ways - that is through regular marketplace sources and not through severe coping strategies (Lemke, 2001:06). Food security depends on sufficiency, efficient and sustainable food production, and storage and access to stable purchasing power. In urban areas household food security is ensured by availability and accessible food prices.

In the rural areas household food security depends upon access to land as it is a part of a multiple livelihood strategy that is particularly important for poorer households to guarantee enough domestic production (de Klerk *et al*, 2004:34; Bellamy, 1998:25). People in the rural areas do not have the same buying power because the population consists of a large number of unemployed and unemployable (the children, the handicapped, the sick and the elderly) people (Kgarimetsa, 1992:10). These communities rely on agricultural activities as a solution to food shortage and as insurance against poverty (Hendricks, 2002:55). For rural people, land ownership is the most critical entitlement for preventing household food poverty (De Rose *et al*, 1998:98). Land is an asset that guarantees food self-reliance or sufficiency hence it is important for them to have their own land. Unfortunately, this principle of land ownership is not applicable to all the population. In the ECSA countries the rural poor (who are the bulk of the poor) are frequently landless, or have access to land through personal

tenacities which provide no guarantees to continued access (UNICEF, 1991:21). This scenario is prevalent in Zimbabwe whereby even though an estimated 3000 000 citizens where given land, they could not produce sufficient crops due to uncertainty of tenure that resulted in making it difficult for the farmers to access credit at the banks (Clover, 2003:8). Those who happen to own land often find that the land is of inferior quality with biophysical constraints such as low fertility and water scarcity as well as the size that is insufficient thus constraining dietary diversity (Lalthapersad-Pillay, 2002:38; Lemke, 2001:22). The outcome of these conditions is production deficit (little or narrow range of produce) that constrains income opportunities, dietary diversity as well as preservation for the future, thus they will experience hunger between the harvests (Hendricks, 2002:53).

Food security refers to the ability of a nation to produce sufficient food to meet the needs of all its citizens. Thus Madeley quoted by Clover (2003:16) defines food security as “the right to everyone to have access to safe and nutritious food, consistent with the right to adequate food and the fundamental right for everyone to be free from hunger.” Food security is an important element of sustainable livelihood. Households experience food insecurity when the livelihood systems, that is the capabilities, assets and activities required for a means of living, changes or fails to adapt to the challenges and shocks from the external environment, such as floods and draught (Lindenberg, 2002:301). Household food security refers to when food, adequate in quantity and quality, which is culturally acceptable, is distributed according to the nutritional requirements among all household members and is accessible to the household throughout the year (Chopra and Cloete, 2001:18).

2.3 DIMENSIONS OF FOOD SECURITY

From the South African context household food security encompasses three distinct, but inter-related elements, as highlighted below in Figure 2.4. These include: availability, accessibility and utilization (Department of Agriculture of the Republic of South Africa, 2002:15).

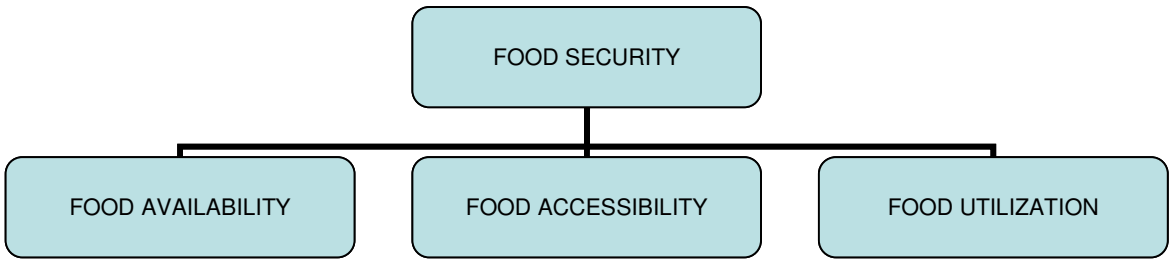

FIGURE 2.4: THE DIMENSIONS OF FOOD SECURITY (Department of Agriculture of the Republic of South Africa, 2002:15)

2.3.1 Food availability

Food availability is understood as having a continuous supply of a sufficient quantity of quality food for consumption at national and household level (Department of Agriculture of the Republic of South Africa, 2002:15). Food availability is a measure of food that is and will be physically available in the relevant vicinity of a population during a given period (Hoddinott and Yohannes, 2002:01). Food availability can be categorised into physical availability and cultural availability (Sanjur, 1982:37). Cultural availability of food is expressed in both the conscious and unconscious decision one makes on the basis of experience and knowledge acquired as a member of a society through socialisations (Sanjur, 1982:42). Thus cultural availability regards food that a society deems edible, harmful, or unacceptable (Sanjur, 1982:37). What one eats, as well as when one eats the food is determined by factors such as knowledge, beliefs, moral law, customs and habits that are inclusive in the concept of culture (Beals, Hoijer and Beals, 1977:27).

Food preferences and food attitudes of household members may influence which cooking techniques are used, how food is distributed and what consumption pattern is practiced (Kgaphola and Boshoff, 2002:06). Thus, for example, beliefs prescribe or design what and when to eat a certain food item. There are specific times during a person's life cycle or health condition when certain foods (these foods are called sympathetic magic food) are forbidden since it is believed that they have special properties that are imparted to those who consume them (Kgaphola and Viljoen, 2004:21; Schifflett, 1976:348). To cite an example, pregnant Swazi women in the Ka-Mantsholo district were forbidden from eating liver and kidneys for these were believed to cause baldness of the baby and the consumption of wild honey would lead to blindness or one under-sized eye (Kgaphola and Viljoen, 2004:21).

Physical availability refers to what is available for consumption in the community, thus it can be used as a measure to prescribe which food coping strategies can be employed. It depends upon access to arable land and the ability of the household to obtain food through own production (Kgaphola and Boshoff, 2002:66). Uneven distribution of food prescribed by gender inequality causes higher levels of under-nutrition among women and girls than among men and boys, as well as higher death rates in the former group **(**Lalthapersad-Pillay, 2002:04).

2.3.1.1 Food stress

A secure food supply to the household does not guarantee on its own that everyone is well nourished or nutritionally secure. This might be due to the presence of factors such as infections, appetite and workload, as previously discussed in 2.2.1. Individual food security refers to the individual's ability to access food in a household (Sayed, 2002:03). Eating enough food, however, does not guarantee a nutritionally diverse diet (Sayed, 2002:04). Therefore, nutrition security is a diet that is adequate not just in terms of quantity, that is total energy (kilocalorie or kiloJoule) intake, but also adequate in terms of quality and includes a variety of protein, vitamin and mineral requirements (Sayed, 2002:04). An individual can thus become nutritionally secure if the food that is consumed is properly utilized by the body. Food insecurity affects the dietary intake and nutritional status of every household member. For example, an adult's health condition may deteriorate and increase the risk for developing chronic diseases (Olson and Holben, 2002:1840). Nutritional status refers to the condition of an individual's health as influenced by food intake and utilization of nutrients such as proteins, carbohydrates, vitamins, minerals, fats and oil, and water (Frankle and Owen, 1993:399). For this research study, dietary intake and body weight assessment are used to assess the nutritional status of an individual or population (Lee and Nieman, 1993:03; Nti *et al*, 1999:169).

Households and household members that are affected by the causes of food insecurity discussed above employ strategies to cope with food stress, especially if food is not available to use. For this study food stress refers to when a household is identified to be experiencing food insufficiency. Food coping strategies are mechanisms that households employ when habitual means of meeting needs are disrupted. These food coping strategies impact household members differently since they are not administered in the same way to each member. For instance, women, as the persons primarily responsible for the preparation and provision of food, use different strategies to cope with food insecurity, often to their own disadvantage. They employ strategies that range from small changes in practice, such as buffering and using food that expands in the stomach (gruel), to relatively severe changes

such as going the entire day without eating (Maxwell, 1996:294). The employment of these strategies has the likelihood of causing impairment to their health status (Thompson, *s.a.*:16).

2.3.1.2 Food coping strategies (FCS)

Households that face the dilemma of food shortages do not sit back and despair. Instead the household decision makers organise the limited resources at their disposal to acquire enough food needed. These activities are referred to as food coping strategies. The strategies referred to include relatively small changes in eating patterns, such as eating less preferred food, to relatively harsh changes, such as skipping meals. A food coping strategy is a means that is employed to cushion the hardship of food stress or to respond to a situation when a household does not have food and does not have enough money to buy food (Hendricks, 2002:54; Maxwell, 1996:294). Thus del Ninno, Dorosh and Smith (2003:1224) define food coping strategies as "mechanisms employed by households when means of meeting needs are disrupted by one or a combination of factors such as drought, floods, low income or high food prices."

The main aim of coping strategies is to preserve productive assets which are needed to sustain a living in the future (Young and Jaspars, 1995:07). For a household these assets might be saving money for purchasing food or preserving enough wild food. People learn through experience of food shortages which specific strategies are best in their situation. Hence IFAD (1998:02); Maxwell, Watkins, Wheeler and Collins (2003:06) state that "there is no universal set of food coping strategies." Even though circumstances differ from one household or society to another, researchers have found that coping strategies tend to follow the same pattern.

All households employ food coping strategies for different reasons. For example, the households that do not experience food shortages employ food coping strategies to add variety to their diet, whereas those who happen to run short of food during the month employ the strategies to increase the available quantity of food. The FCSI score per household varies based on a food coping strategy's severity level, relative frequency, the type and the duration of food stress (Thompson, *s.a.*:15). Again, the level of food security depends upon the severity level of behaviour employed (Maxwell *et al,* 2003:15). For example, a household that employs the most moderate level of strategies, that amounts to a food coping strategy index score that is above 55, is rated as moderately food insecure.

Households with insufficient money to purchase food may resort to reducing dietary costs that might lead to the selection of energy dense foods, increased energy intakes and

subsequently overweight or obesity (Drewnowski, 2004:154). Obesity as a risk factor for non-communicable diseases is a global public health concern since it is estimated that one billion adults are overweight, of which at least 300 million is obese (Kruger, Puoane, Senekal and van der Merwe, 2005:491). The body mass index (BMI) is used to assess a person's weight status and is calculated as kilogram divided by height in meters squared (Guthrie and Piccino, 1995:225). A person with a body mass index (BMI) weight/height (m^2) of 25 to 29.9 are considered to be overweight; when the index is 30 or over they are considered to be obese (Walker, Adam and Walker, 2001:368) This condition is more evident in countries in economic transition from being undeveloped to being developed, such as China, Brazil and South Africa (Senekal, Steyn and Nel, 2003:109; Kruger *et al*, 2005:491).

Table 2.1 displays four generic categories of food coping strategies that are usually employed when there is insufficient food within the household or insufficient money to buy food (Maxwell, 1996:291).

TABLE 2.1: THE FOUR GENERIC CATEGORIES OF FOOD COPING STRATEGIES (FCS)

Generic Food Coping Strategy	Explanation	Example
1. Altering the diet (dietary change strategy)	• When people change their eating behaviour by eating less preferred food or cheaper food items.	• Substituting meat with milk, fish or eggs.
2. Rationing strategies (manage insufficiency)	• Skipping meals. • Stay hungry the whole day without food. • Feeding working members at the expense of the non-working members (buffering). • Limit portion size (the usual quantity of food eaten is reduced to save the rest for the next meal).	• Eating one or two meals instead of at least three per day. • Fathers are given larger portions, while other members (especially women and children) receive small portions.
3. Food seeking strategy. (increasing amount of food available in the short time)	When a household attempt to increase their food supply by using short term activities that are not sustainable over a long period such as: • Borrow money or food. • Gather food such as animals, fish, wild fruits and leaves from the field or rivers.	• Borrow money to buy food. • Borrow food. • Purchasing food on credit.
4. Alteration of the household (household structure strategies)	• During severe food shortages the number of consumers in the household may be reduced by migration of some members. • Decrease the number of people to be fed in short time.	• Children are sent to eat or stay with friends or relatives

(Hendricks, 2002:55; Maxwell, 1996:295; Maxwell *et al,* 2003:05; Studdert, Frongillo and Valois, 2001:2689; Thompson, *s.a.*:14)

The type of food coping strategy to be used is determined by the severity, type and duration of stress (Thompson *s.a.:*15). Hence, household coping behaviour provides an earlier and much clearer signal of the actual level of distress. Thus Maxwell *et al* (1999:413) states that: "even within the same location the sequence of coping may differ markedly from one household to another" (and from one household member to another, as well as time of the month and year). This could be caused by the fact that the resources needed and used for production, purchasing and utilizing food, originate within the household or from the environment in which the household functions and with which it interacts (Kgaphola and Boshoff, 2002:67). Employment of the food coping strategies has the likelihood of causing impairment in the women's health status (Thompson, *s.a.*:16). The administration of food coping strategies is an indication of household food insecurity, but not necessarily of the same severity as another household's. Thus, for example, a household that skip meals for the whole day is more food insecure than the one that switches from consuming meat to soya mince (Maxwell *et al,* 2003:06).

A household can attempt to increase food supplies by applying short-term strategies that are not sustainable over a long period, for example, the consumption of wild foods or immature crops. The collection and consumption of wild foods such as plants, roots and berries is a common strategy used during food insecurity in many parts of Africa (Young and Jaspars, 1995:07). Wild foods are a normal part of the diet for some groups, although their consumption may increase during periods of food insecurity. The type of food eaten is prescribed by the level of food stress. For example, in North Darfur the wild foods that are less desirable, unpalatable or difficult to collect and prepare are only eaten when other sources of food are scarce (Young and Jaspars, 1995:67).

2.3.2 Food accessibility

Access to food or food demand is influenced by economic issues, physical infrastructure and consumer preferences (Latham, 1997:17). The World Food Summit that was held in 1996 recognised poverty and social inequality as a major cause of food insecurity and that sustainable progress in poverty eradication is critical to improve access to food (Thompson, *s.a.*:23). Food access is the ability of a nation or a household to acquire sufficient food on a sustainable basis (Department of Agriculture of the Republic of South Africa, 2002:15). Access to food refers to whether the available food can be reached and it includes households that have the resources, ability and knowledge to produce or procure food (USAID, 1992:03).

Food accessibility depends on entitlements. In a rural context this includes people having, for example, their own land that is fertile enough for cultivation, while for the urban population it basically means having a job or stable source of income to purchase food. Food accessibility entails:

- Physical access

  This refers to the availability of physical infrastructure, for example, whether people live near or far from fresh food markets (this affects the cost of food and variety in the diet), if roads or facilities are available for people to go to a food market and purchase food, and food marketing (or food distribution) facilities.

- Economic access

  This refers to affordability of food prices and if people have money available to purchase or grow their own food.

- Social access

  This is a cultural aspect. Ideology, such as beliefs and practices, determines the likes and dislikes of food by a society. For example, young Black women in South Africa are prohibited from eating eggs as it is believed to cause sexual desire. Thus Thompson (*s.a.:*11) states that "food may be available but not accessible to all individuals due to various reasons."

- Technological access

  This refers to the technological facilities that a household has to prepare or preserve food (Kgaphola and Viljoen, 2000: 69).

2.3.3 Food utilization/consumption

Food utilization or consumption relates to the availability of food. Food utilization or consumption is a measure that determines whether a population will be able to derive sufficient nutritious and safe food during a given period (Hoddinott and Yohannes, 2002:01). Food consumption refers to when food is properly used, proper food processing and storage techniques are employed, adequate knowledge of nutrition is applied, and adequate health and sanitation services exist (USAID, 1992:04).

In conclusion, household food security depends on access to food, financial, physical and social means, as distinct from its availability. For example, food may be abundantly available

on the market, but poor families that can't afford it are not food secure (Bellamy, 1998:25). Households that do not have enough food or enough money to buy food will resort to various activities that will enable them to cope with the hardship of hunger. The more households there are that have to cope, the less food secure they are (Maxwell *et al,* 2003:05). The severity of the strategies differs, as do the consequences, for example, skipping meals for the whole day has an adverse impact on the nutritional status rather than eating less preferred food.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 RESEARCH DESIGN

A quantitative research design was implemented to address the research problem. The study is argued from a deductive reasoning point of view using a cross-sectional survey. Quantitative measures supplemented with qualitative techniques were used to gather data. The researcher used deductive reasoning to test and prove the existing theory, being that Black South African farm workers are an extremely vulnerable group regarding their nutritional status (Kruger *et al*, 2005:830). The theory guides the process of gathering data, thus Neuman (1997:46) states that "in a quantitative study data is collected to support the theory." A theory frames how the researcher views and thinks about a topic. It designs the concepts together with the relevant questions in a study.

3.2 PROBLEM STATEMENT

How do different food coping strategies contribute to food availability and dietary intake of adult women living in farm worker households on Oranje Farm in the Fouriesburg district?

3.3 SUB-PROBLEMS

- What type of food stress, if any, is experienced by the women living in farm worker households on Oranje farm in the Fouriesburg district?
- How does "altering the diet" contribute to food availability of women living in farm worker households on Oranje farm in the Fouriesburg district, when experiencing food stress?
- How does the rationing food strategy contribute to the food availability of women living in farm worker households on Oranje farm in the Fouriesburg district, when experiencing food stress?

- How does food seeking contribute to the food availability of women living in farm worker households on Oranje farm in the Fouriesburg district, when experiencing food stress?
- How does altering the household composition contribute to the food availability of women living in farm worker households on Oranje farm in the Fouriesburg district, when experiencing food stress?
- What other food coping strategies contribute to the food availability of women living in farm worker households on Oranje farm in the Fouriesburg district, when experiencing food stress?
- How do the various food coping strategies relate to the dietary intake of women living in farm worker households on Oranje farm in the Fouriesburg district?

3.4 CONCEPTUALIZATION

The conceptual framework guiding this research study is presented in figure 3.1. All the concepts included in this framework have been defined in the literature review, and are included to show the research pathway. The concepts in green colour within the conceptual framework indicates the relationship between food availability and food coping strategies relevant to this research study and how it may have an impact on the nutritional status of the women. The women's nutritional status per se has not been investigated in this study.

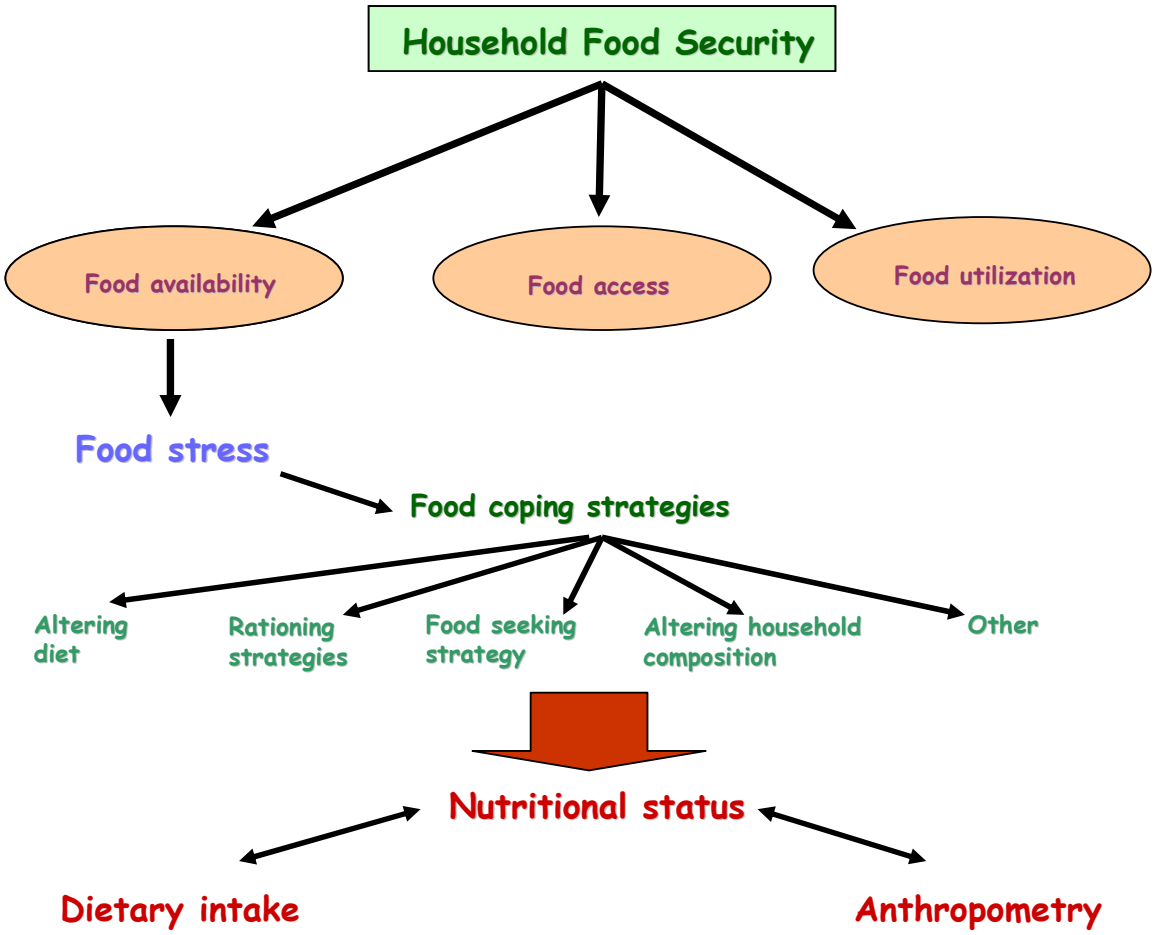

FIGURE 3.1: THE THEORETICAL AND CONCEPTUAL FRAMEWORK (Adapted from Department of Agriculture of the Republic of South Africa, 2002:15; Maxwell, 1996:294)

3.5 OPERATIONALIZATION

Four data gathering techniques were developed and pretested. They were administered to collect data on food coping strategies employed (their severity and frequency), socio-economic status as well as the dietary intake. These techniques were used in order to complement each other and to balance the shortcomings of each technique, since there is no technique without disadvantages (Mouton, 1998:156). Thus, for example, the responses on the food coping strategies questionnaire were used to cross check the responses on the coping strategy index. Due to a low literacy level, an interview was conducted as a means of completing the questionnaires by the researcher in the language of the subject's choice,

being Sesotho. The data was collected by the researcher personally. This impacted the data since the researcher was able to probe for more information through observation of the environment.

3.5.1 Food coping strategies questionnaire

Both open and closed ended questions were used to determine whether this community employs food coping strategies during times of food stress. A face-to-face interview was used to complete the pre-tested questionnaires with the respondents as they were unable to complete the questionnaires. In addition, this enabled the researcher to observe the surroundings and to probe sufficiently to understand and describe the food coping strategies that each family employed, as well as the food available in their households (see Addendum A).

3.5.2 The coping strategy index (FCSI) score

The food coping strategy index is a food consumption-related coping strategy instrument that encompasses a list of coping strategies that are grouped into four generic categories (Maxwell *et al*, 1999:415) (see Addendum B). The basic idea of using this tool is to measure the frequency of the food coping behaviour (how often is the coping strategy used) and the severity (what degree of food insecurity does the strategy suggest) (Maxwell *et al*, 2003:06). Each coping strategy frequency is multiplied by the severity weight and if the result is less than 55 it indicates that the respondent is food secure. The FCSI scores were compared between the five seasons to asses in which season(s) the households' were food insecure/secure. The score was also compared with the respondents' BMI and their nutrient intake.

3.5.3 Observation

Informal observations were made by the researchers throughout the data gathering process to aid understanding of the food coping situation in this study population. Aspects that were observed were the type of food and the preparation methods used by the respondents. This information helped the researcher to determine whether the responses indicated on the questionnaires were trustworthy or not and to describe the practices observed.

3.5.4 The 24- hour dietary recall

This is a quantitative daily consumption method that elicits information on the amounts, nature and the quality of food consumed in a defined period of time at home and even outside the home, such as at school or at work (Hoddinott, 1999:07; Lee and Nieman, 1993:51) (see Addendum C). It further presents information about the preparation of food (method), meal times and food pattern during the week and weekends. The dietary information is evaluated with a computer analysis programme, Food Finder Nutrient Analysis, and compared to standards of nutrient intake (Recommended Dietary Allowance (RDA) **(**Medical Research Council (MRC) of South Africa, 2002). It is used as a reference measure for the food coping questionnaire.

3.6 POPULATION AND THE SAMPLE

The study population and the sample constituted of the Oranje farm community in the Fouriesburg district in the Orange Free State province of South Africa. The farm has a guest house, herd of domestic animals, primary school, residential area for the whole community, a communal water tap, a spaza shop and land that was used for ploughing. Out of eighteen households in the farm worker community on the farm, only fifteen are included in the sample. The exclusion of three households was guided by the fact that the first household inhabitant was a male, the second household inhabitant shared meals with one household included in the thirteen households and the last household occupant was an old woman who was above 55 years. The participants for the research were 21 women. All women are included when reporting the socio-demographic background results, while seven are excluded when giving report about the food coping strategies, body mass index (BMI), as well as nutrient intake, since they did not complete all the data sets.

Twelve families out of the eighteen families have space for growing vegetables, but the appearance of these gardens show that they do not have sufficient growing knowledge and skills, resulting in few vegetables and fruit grown, and a poor variety of foods in their diet.

When fruits are in abundance on their employer's farm they are allowed to harvest as much as they can in order to preserve them for future use. The women who are employed in the guest house sometimes take the left-over food home.

The research group is composed of all women who are between 18 and 55 years and that are responsible for food preparation. Women/caregivers were selected because they are vulnerable to food insecurity that has a negative impact on their nutritional status even though they are responsible for purchasing, gathering and preparing food.

3.7 PROCEDURE AND DATA COLLECTION METHODS

3.7.1 Procedure

Permission to conduct the research was sought and granted from the farmer and the subjects, being women. The research participants were recruited from a gathering that was held to discuss the larger research project and their specific needs. The researcher used this opportunity to invite the women to participate in this part of the research project and to detail the process of the research. The women then signed the consent forms (see Addendum D). The procedure of inviting the women was conducted according to the set ethics of research projects. The research proposal was also submitted to the ethical committee of the faculty of Natural and Agricultural Science at the University of Pretoria (UP).

3.7.2 Data collection methods

Data were collected on five occasions; early summer (early December 2003), late summer (late January 2004), autumn (May 2004), winter (July 2004) and spring (October/November 2004). All the questionnaires (food coping strategy and demographic questionnaire, 24- hour dietary recall, the food coping strategy index (FCSI)[r3]) were completed during the first visit. In addition, four sets of the FCSI were completed per season in order to depict seasonal changes of food availability over one year.

The following instruments were used:

- A structured questionnaire on food coping strategies
  This tool was designed to gather information on the socio-economic status, support group and means of accessing food. The questionnaire was completed by the researcher, using face-to-face interviews as a way of completing the questionnaire since the respondent's literacy skills were poor. The researcher read and explained

each question and then allowed the respondent to respond to the question. The response was recorded on the corresponding question by the researcher.

- Food coping strategy index

  The knowledgeable women in the household, regarding food preparation and distribution within the household, were asked to complete the FCSI instrument for the previous week (seven days) (Maxwell et al, 1999:416). The researcher read the question and allowed the responded to respond. The response was recorded on the questionnaire by the researcher. This was done to establish which food coping strategies were employed during food shortage in the five seasonal periods and collectively over a year.

- Observation

  This method was used to enrich the data collected using a structured questionnaire on food coping strategies, food coping strategy index and 24-hour dietary recall questionnaires. Field notes were compiled through observing the respondent's environment whereby factors such as types of food kept, bought or grown in the vegetable garden were looked into. Additional secondary data were obtained from the additional research reports by Green (2005:79) and Matla (2008)**.** These notes were used to verify the response about the types of food the respondents had reported on the 24-hour recall questionnaire, as well as the other practices relating to food purchasing. Thus, the observation method was only used to enrich the other three methods of data collection, and was therefore not reported as such.

- 24-hour Dietary recall

  Only one 24-hour dietary recall was used to assess dietary intake and food consumption patterns of the respondents. Due to practical considerations this[r4] was completed over a long weekend. The questionnaire consisted of seven meal periods namely early morning, breakfast, mid morning, lunch, mid afternoon, supper and late night snack. Since reliable food portion size estimates from subjects presents a major difficulty in dietary intake surveys, a validated food portion photograph book (FPPB) was used to estimate food portion sizes (MacIntyre *et al,*2002:241). The other options to verify the quantity of food were portion size, different utensils, examples of packaging and examples of actual food. The researcher explained the content of the 24-hour recall form and conducted a 24-hour recall procedure whereby each respondent was asked to recall in detail all the food and drinks consumed the previous day[r5] which was Sunday[r6]. All the respondents indicated no difference between week and weekend days in their food consumption patterns. As the respondent listed the food consumed,

they also estimated the quantity consumed by pointing out the appropriate photograph in the FPPB or by using utensils. Each interview took 30-35 minutes to complete. To get clarity on certain phenomena, the researcher used probing questions (Babbie and Mouton, 2001:253). For example, if the interviewee had reported that she had consumed meat, a follow up question was: with which accompaniment did she serve the meat? A full description of the accompaniment enabled the researcher to identify all the additional food items that were consumed.

3.8 DATA ANALYSIS

A statistical analysis was done using descriptive statistics (means and frequencies) for analysing the 24[r7]-hour recall data. Inferential statistics (Fisher's Exact Test, signed rank Test and Friedman two way analyses and variance) were used to analyse the frequency and severity level of the food coping strategies (SAS Institute Inc., 1999).

3.8.1 Ranking and weighting of the food coping strategies

Ranking and weighting are terms used in this context to enclose the severity ranking (level) of individual food coping strategies (Maxwell *et al*, 2003:12). Ranking ranges from least severe, to moderately severe, severe, and very severe and they are numbered from 1-4 respectively. When calculating a household FCSI score, the number that is assigned to the severity level is multiplied by two (weighting). For example, an assigned severity level of 4 will be weighted by 2 to appear as 8 in the final ranking level, since severity levels are reported in whole numbers.

The importance (ranking) assigned to the different food coping strategies is not the same in all cultures, thus it is important for each community to do the ranking exercise on their own (Maxwell *et al*, 2003:12). For example, it might be a shame in a certain community to consume seed stock, while to send members to beg is perceived as normal and acceptable behaviour in another community. In this study, focus groups were established for ranking the food coping strategies according to their perception of the level of severity. Focus groups consisted of the women from the farm worker community.

In order to conduct an analysis of the FCSI, the following sets of information about the employed food coping strategies need to be ascertained (Maxwell *et al*, 2003:11). Firstly, "weight" or rank needs to be added to every individual strategy according to the specific

community understanding. This kind of ranking is used to determine the severity level of each strategy. As mentioned previously, the use of food coping strategies differ from one community to the next based on factors such as finance, household structure, food practices, food accessibility and availability. The same is true for the level of importance or weight that each strategy has in a community. In this study, the community established their own ranking as very severe, severe or least severe (see Table 4.2). The method applied to achieve a consensus on ranking the food coping strategies is discussed in 3.8.1. The last step is to calculate a household's FCSI score.

The women were divided into three groups of seven members each. In order to try to minimise grouping friends or uncooperative participants in the same group, the women were allocated to groups. Based on familiarity, due to several previous visits with the group, it was not difficult to identify each member's personal traits. These women were allowed to discuss amongst themselves and to come to a consensus on how to rank the strategies into different levels of severity. The ranking of the food coping strategies was done after data collection so as not to have any impact on the filling in of the FCSI during the research period.

In order to determine the rank of each food coping strategy, the group members had to:

- Firstly group the strategies into categories that are of roughly the same level of severity,
- Establish the level of extremity of each coping strategy; that is the very severe, as well as the least severe. Subsequently, the strategies that did not fall into either of the two extreme levels were then grouped as the severe or moderately severe strategies, and
- After deciding on the levels of severity, numeric values were assigned to the strategies in terms of relative frequencies in order to calculate a household's FCSI score according to the method of Maxwell *et al* (2003:06).

3.9 THE QUALITY OF THE RESEARCH

The quality of the research is evaluated against the validity framework of Mouton (1998:111). The framework is based on the stages of the research process; sources of error and methodology that are taken to ensure a specific validity related criterion.

3.9.1 The theoretical and content validity

The researcher has defined and conceptualised concepts in the conceptual framework (Figure 3.1) against the body of existing theory and research (Babbie and Mouton, 2001:109). This process clarifies the main concepts and their relationships within the conceptual framework. The dimensions and indicators of the concepts (i.e. the scope of the concepts) are also specified. The study leaders and other experts in the field approve this process.

3.9.2 Measurement/construct validity

Construct validity is based on the logic relationship among variables (Babbie and Mouton, 2001:123). Therefore, measurement of body mass index of adult women is used as an external criterion for dietary intake and food coping strategies.

3.9.3 Internal validity and transferability

This research can claim internal validity since the sample is not representative of the total population of commercial farms in South Africa. This study forms part of a larger research focus, with the aim to construct a model for addressing food security. Therefore, this research is concerned about the transferability of its findings to another similar population (Babbie and Mouton, 2001:277). The FCSI and the food coping questionnaires can then be used on a similar population to compare the outcomes.

3.9.4 Inferential validity

The analysis was done with the research question as the point of departure and a thorough understanding of related literature. The researcher included all conclusions from the drawn research findings.

3.9.5 Reliability

Reliability is maximised by minimising error during data collection. The researcher is aware of all observation effects and tried to minimise them. The interviewer is familiar with the

research setting, has good rapport with the research participants and can communicate well. The researcher made sure to treat the participants with dignity and to record answers and observations accurately. Two fieldworkers were involved in data gathering. Participation in the research has always been with the consent of the research participants.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 INTRODUCTION AND BIOGRAPHIC INFORMATION

The study population consisted of the Oranje farm community in the Fouriesburg district in Orange Free State (OFS) Province of South Africa. This farm is located in a valley created by the Maluti and Rooiberge mountains. Their residential area is located on a sloping area that is environmentally degenerated, thus producing a poor or low agricultural output. The population comprises of eighteen households, but only fifteen households participated in the research. The sample consisted of twenty one women or caregivers who were aged between 18 and 55 years and were responsible for food provision in the households. Not all of the women completed the FCS questionnaires that formed a part (five seasons) of the study; therefore, the comparisons between the seasonal usages of FCS could only be done for thirteen women. Thirteen percent of the women were relatively young, between the age of 18 and 39, while 8% were within the age of 40 and 55. The total number of the respondents exceeds that of the households because some households, such as household number 2, 6, 7, 10, 15 and 16, have more than one woman/caregiver.

Most respondents (85%, n=18) have access to agricultural space or land in front of their yards for growing vegetables for their own use such as carrots, beetroots, spinach, tomatoes and a variety of pumpkins. Fifteen percent (n=3) respondents did not use the land that was available for gardening and did not account for their behaviour except for one respondent who was bedridden by the time of visit (season). The length of the garden ranges from 5.1m to 15.4m, while the breadth ranges between 4m and 12.7m (Matla, 2008:60). The content and the appearance of these gardens show that the owners do not have sufficient gardening knowledge and skills, for example, on how to prevent soil erosion, since the gardens are located in a sloping area. Most of the gardens are either not in proper use or are used as dumping areas. Those who sometimes use the land, harvest inferior quality and limited quantities, since they consumed most of their products while still in season. Some households have peach and apricot trees in and around their yards which they usually share with other households that are without trees. When fruits (apricots and peaches) are in abundance on their employer's farm, all community members are allowed to harvest as much

as they can to eat and to preserve by either preparing jam or sun-drying them for future use. The women who are employed in the guest house on the farm sometimes take some leftover food home.

This community has a primary school and a spaza shop. A spaza shop is an informal business operating from a residential stand or home that engages in the trading of consumer goods. It is designed for low income spenders since they believe that spaza shops are inexpensive compared to convenience stores (Ndhlovu, Peterson and Ndhlovu, 2002:02). The educators that are employed in this school stay on the farm in rooms next to the school and visit their families on weekends and during school holidays. This primary school is a feeder school of the secondary school on the neighbouring farm that is about one kilometre away. For higher education the children have to leave their homes and stay with relatives or friends away from the farm.

Women/caregivers were chosen for the study as they are responsible for food provision. They are mostly responsible for children's needs and, therefore, they always want to see their dependants well fed before they feed themselves. This scenario causes a poor nutritional status irrespective of the fact that they are responsible for purchasing, gathering and preparing food almost daily. Their access to livelihood is severely constrained by cultural, socio-economic and political factors (Hendricks, 2002:51).

The results are presented in three categories, namely socio-economic, food coping strategies and nutrient intake.

4.2 SOCIO-ECONOMIC BACKGROUND

Transformation in the country brought about changes that either benefited or disadvantaged citizens. For example, the policy of registering employees with the Unemployment Insurance Fund (UIF) by the Labour Relations Act disadvantaged some farm worker employees (Kruger *et al*, 2005:833). Prior to the introduction of the policy, the permanently employed Oranje farm employees' working hours were about ten hours per day. The impact of the policy on these employees was negative since some of them had their working hours reduced to five hours per day and, therefore, the food ration was minimised. The most affected group are the women who are employed in the guest house. Women working in the guest house were taught multi-skilled tasks from cooking food and preserving fruits to serving guests, as well as maintaining the flower garden around the guest house. Even though it is a global practice

that all employable farm residents must serve the farm owner to secure a residential status, this is not the case on Oranje farm (Kruger *et al*, 2005:833).

Out of 81 members from the fifteen households that comprise both adults and children, only 18 household members are employed. There are four households that have a family member that is not employed on the farm due to health reasons. The inhabitant of the first household is a single male who incurred a leg injury while on duty on the farm, thus making him medically unfit for work. He is not included in Table 4.1 below as only women form part of the research sample. Household number 8a makes a living solely from the social security in the form of a pension fund that is received by the husband from the Social Development Department. Two households, 10a and 11, survive on the mercy of relatives, friends and neighbours. Thus, the former household is able to spend R300.00 on food even though it does not have any tangible income. Household 11 has additional support from the Social Development Department in the form of food parcels. Households with one or more members employed on the farm, receive a remuneration package, ranging from R296.00 to R650.00 per month (see Table 4.1). All households receive benefits such as free access to housing, as well as clean and safe water, in addition to their salaries. This gesture was not different from other farm workers in Ventersdorp District, North West Province (Kruger *et al*, 2005:832). Pre-paid electricity and toilet facilities are the responsibility of each household, thus only a few households have access to this service.

The sources of income, the amount of money spent on food, as well as the quantity of maize meal donated by the employer is summarised in Table 4.1

TABLE 4.1: THE SOCIO-ECONOMIC STATUS OF THE FARM WORKERS ON ORANJE FARM

Household number	Number of house-hold members	Number of members employed	Household total monthly income				% of the money spent on food	Payment in kind - Maize meal quantity	Available money for food per person in household per month
			Salaries	Social grant	Relatives	Money spent on food			
(n = 15)	(n = 81)	(n = 18)	(R)	(R)	(R)	(R)	(%)	(kg)	(R)
1	11	3	920.00			300.00	18	160	27.27
2	5	1	400.00			200.00	50	80	40.00
3	2	1	300.00			150.00	50	80	75.00
4	11	1	920.00			300.00	32	80	27.27
5	5	2	550.00			180.00	33	120	36.00
5	5	2	1225.00			550.00	45	60	110.00
6	3	1	456.00			150.00	33	50	50.00
7	5	1	400.00			100.00	25	80	20.00
8a	4	none		700.00		200.00	29	-	50.00
9b	7	3	1140.			300.00	26	160	43.00
10a	9	none			300.00	300.00			33.33
11(a)	2	1	400.00			200.00	50	80	100.00
11	4	none			none				none
12	3	1	650.00	860.00		250.00	17	40	83.33
13	5	1	450.00			250.00	55	60	50.00

α All household members are unemployed
b One household member is employed in Fouriesburg town
R South Africa Rand
Kg kilograms

Table 4.1 indicates that most households survive on a monthly salary, two on security grants and two on handouts from relatives. Examination of the occupational composition reveals that six women (29%) are employed. Five women are farm employees in the guest house, while the other one woman is a housekeeper in the nearby town of Fouriesburg. The guest house employees' status differs with regard to the type of work that they perform. Two are employed on a full-time basis, while three are part-time employees only. The rest of the women are sometimes employed as casual workers, for example, when the farm owner has to host an event such as a wedding celebration or when it is planting/weeding/harvesting time on the farm and extra hands are needed. There are limited job opportunities on the farm for the women.

Out of the 15 households investigated, n = 12 (80%) households have one or more member(s) employed on the farm. The employees that are dominated by males render different types of jobs, such as gardening, cleaning, driving, care-giving, milking, herding the

animals and ploughing the fields. The most common jobs are that of driver (n=5, 33%) and guesthouse worker (n=5, 33%).

The operation of the guest house increased the number of employment opportunities available, mostly for the women on the farm. This is an advantage for the women and their households, since they are responsible for feeding their families and it is difficult to render this service if one does not have an income. Each farm employee receives a donation (payment in kind) of maize meal on a monthly basis. This treatment is similar to that of other farm workers in the Ventersdorp district (Kruger *et al*, 2005:833). The quantity of the maize meal received (see Table 4) is determined by the number of employees per household and their working hours per week, coupled with the type of work they are rendering. The other donations/payment in kind includes bread flour (for those working in the fields) and mutton as a Christmas bonus for all households in the community. This community is able to buy subsidised food products such as fresh milk and eggs from the farm owner.

The income for household 12 is high as it receives money from two sources, namely security grants (for the grandmother and the grandson) from the Department of Social Development, as well as the daughter's remuneration as she is employed on the farm. Groceries are purchased in Fouriesburg town, mostly only once a month. About thirteen households spend between R100.00 and R300.00 per month on food. Eleven households have reported to suffer from food shortages either in the third or fourth week of the month. The food item/s that some of the community members usually run short of are meat (ten households), maize meal (four households), and vegetables such as cabbage and potatoes (eight households). The meat is substituted with eggs, milk, wild green leaves or vegetables. The maize meal is borrowed from friends and it is replaced at the end of the month.

The households that receive donations from the employer are better off since they use their salary to supplement the maize meal for other basic food items such as eggs, milk and vegetables. There are three households who indicate that the maize meal they receive is not adequate. Household number 1 shares their donation with the pigs, household number 5 feeds the dogs from the same maize meal, while in household number 6 a portion of the maize meal is used to prepare traditional beer to consume with friends. The last household that experiences the same food shortage is number 10a, but they do not state the reason. The households that run short of certain food items feel that the food is not enough to last them for a month. For this reason they are bound to employ one or two types of food coping strategies to increase the amount of food they have in hand.

4.3 FOOD COPING STRATEGIES (FCS)

The type of food coping strategy employed is determined by food accessibility and availability. For example, this community rarely fishes because the nearby dam does not have enough water, thus the fish are few. On the other hand, they practice food gathering since there is abundant space for collecting wild green leaves. Thus, they are able to consume the wild leaves throughout the year.

TABLE 4.2: RANKING PROCEDURE OF THE FOOD COPING STRATEGIES

Food coping strategies (FCS)	Severity ranking			Average Ranking core (b)	Consensus ranking/ severity weighting (calculated)	Severity ranking (c)
	FG 1 (a)	FG 2	FG 3			
1. Eat less preferred food	1	1	1	3/3	1	2
2. Borrow food	3	4	3	10/3	3	6
3. Buy food on credit	4	3	4	11/3	4	8
4. Gather wild food	3	4	2	9/3	3	6
5. Consume seed stock	4	4	4	12/3	4	8
6. Send members to eat elsewhere	3	4	3	10/3	3	6
7. Send members to beg	3	2	3	8/3	3	6
8. Limit portion size	4	2	2	8/3	3	6
9. Restrict consumption in favour of children	3	4	4	11/3	4	8
10. Feed working members at the expense of non-working members	3	3	3	9/3	3	6
11. Ration money to buy ready to eat food	1	1	1	3/3	1	2
12. Skip meals the entire day	4	4	4	12/3	4	8

a FG Focus group

b Average Ranking Score=Sum of severity ranking done by each FG divided by the number of focus groups (Maxwell *et al*, 2003:13)

c Severity Ranking = (weighting achieved by multiplication of calculated Ranking Score by 2). The ranking pattern is as follows "Least severe" with a weighting score of 2; "Severe" with a weighting score of 6; and "very severe" with a weighting score of 8

The focus group consensus on the ranking of strategies reads as follows: two FCS No 1 and 11 are categorised as least severe; six FCS No 2, 4, 6, 7, 8 and 10 are categorised as severe, while four FCS No 3, 5, 9 and 12 are categorised as very severe.

The use of relative frequencies, such as every day, pretty often, once in a while, hardly at all and never, are a better way of reporting how often a coping behaviour was employed in the recent past (the previous week/month), than expecting the respondents to be giving the exact numbers (Maxwell *et al*, 2003:06) (see Table 4.3 and Addendum B).

TABLE 4.3: ASSIGNING NUMERIC VALUES TO THE RELATIVE FREQUENCIES

RELATIVE FREQUENCIES	All times? everyday	Pretty often? 3-4 * week	Once in a while? 1-2 */week	Hardly at all? <1 week	Never 0 week
NUMERIC VALUES	7	4.5	1.5	0.5	0

(Maxwell *et al*, 2003: 14)

The numbers which represent the proportion of the days of a week in the bottom row in Table 4.3 are the numeric values allocated to the frequency descriptions. These numeric values (7, 4.5, 1.5, 0.5 and 0) are used to record the respondents' food coping strategies employed per season (see Addendum B). Tables 4.4 – 4.8 give the results of food coping strategies which are commonly employed by individual respondents during different seasons. The results are given in numeric values (see Table 4.3) as a description.

The score that is indicated in the last column of each table (4.4 – 4.8) is obtained by multiplying the numeric values (raw score) that are recorded on the coping strategy questionnaire, by severity ranking (see Table 4.2, last column) with regard to coping strategies established by the community. For example, this is how the score of 25 for respondent number one in Table 4.4 is calculated: 4.5 x 2 = **9,** + 0.5 x 6 = **3,** + 1.5 x 8 = **12,** 0.5 x 2 = **1.** The bolded figures are then added together to get 25, which is the total individual food coping strategy index (FCSI) score during early summer season.

The results in the five tables is a record of the 13 respondents, since they were the ones who were present during each visit (season) for completing the questionnaires.

Table 4.4 displays the food coping strategies that are employed by individual respondents during the early summer season.

TABLE 4.4: FOOD COPING STRATEGIES EMPLOYED IN EARLY SUMMER

HH No	Respondent's number	FOOD COPING STRATEGY NUMBERS												Total individual (FCSI)score
		1	2	3	4	5	6	7	8	9	10	11	12	
		FCS RANKED AND WEIGHTED LEVELS												
		2	6	8	6	8	6	6	4	6	6	2	8	
1	1	4.5			0.5	1.5						0.5		25
1	2	1.5			1.5	1.5								24
1	3	1.5		1.5	0.5	1.5								30
2	4	4.5			0.5	4.5								48
3	5	4.5			4.5	1.5		1.5						57
4	6	4.5			0.5	1.5			0.5					26
5	7	1.5			1.5		0.5							15
5	8	4.5		4.5	4.5	1.5								84
6	10	4.5		1.5	1.5	1.5								42
8	12	4.5		0.5	0.5	1.5								28
9	13	4.5			0.5	0.5								16
14	15	4.5			4.5	1.5					1.5			57
16	19	4.5						0.5			0.5			15
Total of respondents who employed the coping strategy out of 13		13	0	3	6	10	0	1	0	0	1	0	0	

HH NO = Household number
All blank cells in the table refers to the fact that no coping strategy was employed

Food coping strategies (FCS)

1. Cheaper food.
2. Borrow food or money.
3. Buy food on credit.
4. Gather wild food.
5. Consumption of seed stock.
6. Eat elsewhere.
7. Beg for food.
8. Reduce portion size.
9. Decrease adult food intake.
10. Feed workers first.
11. Ration money.
12. Skip meals.

From Table 4.4 it can be ascertained that during early summer the food coping strategies that are employed the most are: relying on less preferred food or cheap food (FCS NO 1) by almost the whole community (n=13), gathering wild food (FCS NO 4) by half of the community (n= 6), as well as consumption of seed stock (FCS NO 5) by three quarters of the community (n= 10). Most respondents employ the food coping strategies of severe and very severe levels at least once or twice per week. Respondent's number 5, 8 and 15 have the total individual FCSI score that is above 55, the bench mark of measuring food security. According to Maxwell *et al* (2003:16), a total individual FCSI score of 55 is more food secure than a total score that is above 55, provided the individuals that are compared are from the same community, location or culture. The more coping strategies reported, the more food insecure the household.

Table 4.5 reflects the food coping strategies that are employed by individual respondents during late summer.

TABLE 4.5: FOOD COPING STRATEGIES EMPLOYED IN LATE SUMMER

HH No	Respondent's number	FOOD COPING STRATEGY NUMBERS												Total individual (FCSI)score
		1	2	3	4	5	6	7	8	9	10	11	12	
		FCS RANKED AND WEIGHTED LEVELS												
		2	6	8	6	8	6	6	4	6	6	2	8	
1	1	4.5			4.5	7				0.5	0.5			98
1	2	1.5			4.5	0.5			1.5	7				82
1	3	7			1.5				7	7				93
2	4	1.5	4.5		1.5	1.5				1.5	7			102
3	5	4.5			4.5	0.5								40
4	6	1.5		1.5	1.5	1.5								36
5	7				0.5	0.5								7
5	8	1.5	4.5	1.5	4.5	1.5			4.5	4.5		1.5		129
6	10	7	1.5	1.5	1.5				1.5					50
8	12	7			7									56
9	13	1.5			1.5									12
10	15	1.5	0.5	1.5	4.5	0.5				0.5				52
12	19	1.5			1.5	0.5				0.5				19
Total of respondents who employed the coping strategy out of 13		12	3	4	13	4	0	0	4	4	1	1	0	

HH NO = Household number
All blank cells in the table refers to the fact that no coping strategy was employed

Food coping strategies (FCS)
1. Cheaper food.
2. Borrow food or money.
3. Buy food on credit.
4. Gather wild food.
5. Consumption of seed stock.
6. Eat elsewhere.
7 Beg for food.
8 Reduce portion size.
9 Decrease adult food intake.
10 Feed workers first.
11. Ration money.
12. Skip meals.

According to Table 4.5, it can be seen that the whole community mainly employs the least severe FCS NO 1 (relying on the less preferred or cheap food) and severe FCS NO 4 (gathering of wild food). Six respondents (No. 1, 2, 3, 4, 8 and 12) have a total individual FCSI score that is above 55.

Table 4.6 displays the food coping strategies that are employed by individual respondents during autumn.

TABLE 4.6: FOOD COPING STRATEGIES EMPLOYED IN AUTUMN

HH No	Respondent's number	FOOD COPING STRATEGY NUMBERS												Total individual (FCSI)score
		1	2	3	4	5	6	7	8	9	10	11	12	
		FCS RANKED AND WEIGHTED LEVELS												
		2	6	8	6	8	6	6	4	6	6	2	8	
1	1	1.5		4.5	1.5			1.5						57
1	2	1.5	1.5	1.5	1.5									33
1	3	1.5			1.5				1.5	1.5				27
2	4	1.5	4.5		4.5	7				1.5				122
3	5	1.5			4.5	1.5								42
4	6	1.5		4.5	4.5									66
5	7	4.5	1.5		4.5		1.5		1.5					60
5	8	1.5			1.5									12
6	10	4.5		7	4.5	1.5	1.5							113
8	12	1.5			1.5					4.5				39
9	13	1.5			1.5				4.5					30
10	15	4.5		1.5	1.5				1.5					36
12	19	1.5	1.5		1.5									21
Total of respondents who employed the coping strategy out of 13		13	4	5	13	3	2	1	4	3	0	0	0	

HH NO = Household number
All blank cells in the table refers to the fact that no coping strategy was employed

Food coping strategies (FCS)

1. Cheaper food.
2. Borrow food or money.
3. Buy food on credit.
4. Gather wild food.
5. Consumption of seed stock.
6. Eat elsewhere.
7. Beg for food.
8. Reduce portion size.
9. Decrease adult food intake.
10. Feed workers first.
11. Ration money.
12. Skip meals.

The whole community mainly employs the least severe food coping strategies, relying on less preferred or cheap food (FCS No 1), and the severe level of gathering wild food (FCS No 4). Five respondents (No. 1, 4, 6, 7 and 10) have a total individual FCSI score that is above 55. Respondent 4 employs food coping strategies of severe level three to four times per week, as well as very severe strategies seven times (days) per month, thus can be regarded as experiencing severe food stress during the autumn season.

Table 4.7 reflects the food coping strategies that are employed by individual respondents during the winter season.

TABLE 4.7: FOOD COPING STRATEGIES EMPLOYED IN WINTER

HH No	Respondent's number	FOOD COPING STRATEGY NUMBERS												Total individual (FCS)score
		1	2	3	4	5	6	7	8	9	10	11	12	
		FCS RANKED AND WEIGHTED LEVELS												
		2	6	8	6	8	6	6	4	6	6	2	8	
1	1	1.5			4.5	1.5			4.5	1.5		0.5		70
1	2	1.5			4.5	1.5			4.5	4.5		1.5		90
1	3	7			1.5	1.5	1.5					1.5		47
2	4	4.5			1.5	0.5								22
3	5	4.5		0.5	1.5	4.5								58
4	6	1.5			1.5	1.5			1.5	1.5				39
5	7	4.5			1.5	1.5					1.5			39
5	8	4.5	0.5	0.5	4.5	1.5			4.5	4.5				100
6	10	4.5		1.5	1.5	4.5			1.5					72
8	12	0.5			1.5	4.5			7	7				116
9	13	7			1.5	0.5			1.5			0.5		34
10	15	1.5			1.5				0.5					14
12	19	4.5	1.5		1.5	4.5					4.5			90
Total of respondents who employed the coping strategy out of 13		12	1	1	13	10	1	0	7	5	2	2	0	

HH NO = Household number
All blank cells in the table refers to the fact that no coping strategy was employed

Food coping strategies (FCS)
1. Cheaper food.
2. Borrow food or money.
3. Buy food on credit.
4. Gather wild food.
5. Consumption of seed stock.
6. Eat elsewhere.
7 Beg for food.
8 Reduce portion size.
9 Decrease adult food intake.
10 Feed workers first.
11. Ration money.
12. Skip meals.

All respondents employ food coping strategies of various severity levels, such as relying on less preferred or cheap food (FCS No 1), gathering wild food (No 4), consuming seed stock (FCS No 5) and reducing portion sizes (FCS No 8). Seven respondents (No. 1, 2, 5, 8, 10, 12 and 19) have a total individual FCSI score that is above 55. Six respondents employ a food coping strategy of severe level once to twice per day in a month, while four respondents employ the same level three to four times a week per month.

Table 4.8 display the food coping strategies that were employed by individual respondents during the spring season.

TABLE 4.8: FOOD COPING STRATEGIES EMPLOYED IN SPRING

HH No	Respondent's number	FOOD COPING STRATEGY NUMBERS												Total individual (FCS)score
		1	2	3	4	5	6	7	8	9	10	11	12	
		FCS RANKED AND WEIGHTED LEVELS												
		2	6	8	6	8	6	6	4	6	6	2	8	
1	1	4.5		4.5	4.5	0.5			1.5	4.5	4.5			136
1	2	4.5			1.5				1.5					24
1	3	7		0.5	1.5	1.5								39
2	4	1.5		1.5	1.5	0.5		0.5	0.5	7	7			117
3	5	4.5		1.5	4.5									48
4	6	4.5			1.5	1.5				7				72
5	7	4.5			1.5	1.5								30
5	8	7	0.5	1.5	7	1.5								83
6	10	4.5		1.5	1.5									30
8	12	1.5			1.5									12
9	13	1.5			1.5									12
10	15	4.5		1.5	4.5									48
12	19	7			1.5				1.5					29
Total of respondents who employed the coping strategy out of 13		13	0	6	13	4	0	0	3	3	2	0	0	

HH NO = Household number
All blank cells in the table refers to the fact that no coping strategy was employed

Food coping strategies (FCS)
1. Cheaper food.
2. Borrow food or money.
3. Buy food on credit.
4. Gather wild food.
5. Consumption of seed stock.
6. Eat elsewhere.
7 Beg for food.
8 Reduce portion size.
9 Decrease adult food intake.
10 Feed workers first.
11. Ration money.
12. Skip meals.

All respondents employ food coping strategies of various severity levels. The food coping strategies that are commonly practised are relying on less preferred or cheap food (FCS NO 1) and gathering wild food (FCS NO 4) by the whole community, as well as buying food on credit (FCS NO 3) by half of the community. Four respondents (No 1, 4, 6 and 8) have a total individual FCSI score that is above 55. Respondent number 1 employs a food coping strategy of severe level three to four times a week per month, thus making her to be severely food insecure during spring.

4.4 RESULTS OF EMPLOYED FOOD COPING STRATEGIES PER SEASON

In order to show a clear picture of food coping behaviour practiced in this farm worker household community, the food coping strategies of all respondents from each season are ranked according to the manner in which they are employed (see Table 4.9).

TABLE 4.9: FOOD COPING STRATEGIES MOST COMMONLY EMPLOYED BY THE COMMUNITY IN FIVE SEASONS

THE FREQUENCY IN WHICH EACH FOOD COPING STRATEGY ARE EMPLOYED BY INDIVIDUAL RESPONDENTS.													
HH NO	Respondent's NO	FOOD COPING STRATEGIES											
		1	*4*	*5*	*8*	*3*	9	2	6	7	10	11	12
2	1	**5**	**4**	**3**	**2**	**2**	2	0	0	1	1	0	0
2	2	**5**	**4**	**2**	**3**	**1**	2	1	0	0	0	1	0
2	3	**5**	**4**	**3**	**2**	**1**	2	0	1	0	0	1	0
3	4	**5**	**4**	**3**	**0**	**2**	3	3	0	0	2	0	0
4	5	**5**	**5**	**3**	**0**	**1**	0	0	0	1	0	0	0
5	6	**5**	**4**	**4**	**1**	**2**	2	0	0	0	0	0	0
6	7	**4**	**4**	**2**	**2**	**1**	0	1	1	0	1	0	0
6	8	**5**	**5**	**4**	**2**	**3**	2	1	0	0	0	0	0
7	10	**5**	**5**	**3**	**2**	**5**	0	2	1	0	0	0	0
9	12	**4**	**4**	**2**	**1**	**0**	1	1	0	0	0	0	0
10	13	**5**	**4**	**0**	**2**	**0**	0	0	0	0	0	0	0
14	15	**5**	**5**	**1**	**1**	**3**	1	0	0	0	1	0	0
16	19	**5**	**4**	**1**	**1**	**0**	0	2	0	0	1	0	0

The bolded FCS are the ones that are commonly used

Food coping strategies (FCS)

1. Cheaper food.
2. Borrow food or money.
3. Buy food on credit.
4. Gather wild food.
5. Consumption of seed stock.
6. Eat elsewhere.
7. Beg for food.
8. Reduce portion size.
9. Decrease adult food intake.
10. Feed workers first.
11. Ration money.
12. Skip meals.

The figures under each of the food coping strategies and parallel to the respondents' numbers indicate the number of times a food coping strategy is employed in five seasons. For example, figure '5' indicates that the first respondent employs the first coping strategy in each season, while figure '0' indicates that respondent 1 has never employed food coping strategies number 2, 6 and 11 in any season. The five bolded food coping strategies, namely relying on less preferred or cheap food, buying food on credit, gathering wild food, consuming seed stock and reducing portion size, are the most commonly used.

Table 4.10 outlines the rating of food coping strategies as employed by the respondents.

TABLE 4.10: RATING FOOD COPING STRATEGIES EMPLOYED BY RESPONDENTS THROUGHOUT THE FIVE SEASONS MEASURED FROM HIGH TO LOW LEVEL

FOOD COPING STRATEGIES	THE FOOD COPING STRATEGIES INDEX (FCSI) SCORE PER SEASON						
	EARLY SUMMER (n = 13)	LATE SUMMER (n = 13)	AUTUMN (n = 13)	WINTER (n = 13)	SPRING (n = 13)	TOTAL N = 65	TOTAL %
1	13	12	13	12	13	63	96.9
4	6	13	13	13	13	58	89.2
5	10	4	3	10	4	31	47.6
3	3	4	5	1	6	19	29.2
8	0	4	4	7	3	18	27.6
9	0	4	3	5	3	15	23
2	0	3	4	1	0	08	12
10	1	1	0	2	2	06	0.09
6	0	0	2	1	0	03	0.04
11	0	1	0	2	0	03	0.04
7	1	0	1	0	0	02	0.03
12	0	0	0	0	0	00	0.0

Food coping strategies (FCS)

1. Cheaper food.
2. Borrow food or money.
3. Buy food on credit.
4. Gather wild food.
5. Consumption of seed stock.
6. Eat elsewhere.
7. Beg for food.
8. Reduce portion size.
9. Decrease adult food intake.
10. Feed workers first.
11. Ration money.
12. Skip meals.

The above table presents the food coping strategies employed by households. The figures that are parallel with the food coping strategies column indicate the total number of respondents who have employed those food coping strategies per season. Thus, figure 13 implies that all the respondents have employed the particular strategy, since the results are based on 13 respondents and not 21.

Most households (96.9%) have altered their diet by using lower cost foods such as vegetables, milk, chicken feet, meat bones, soya mince soup, fish and eggs, instead of meat. There are two households (n=2, 3.1%) that do not use this practice. One household mentions that the low cost foods are tasteless and of poor quality, while the other household did not give a reason.

Similar findings of Kgaphola and Viljoen (2000:70) state that all households (100%) have reported that they gather uncultivated wild food from the veldt during the five seasons to supplement their food supply. This community specifically consumes the following wild green leaves: *sebitsa, thepe, papasane, seruwe and tename*. The families that practice buying food

on credit or borrow money to buy food, return the food or money at the end of the month so that they can be helped next time the need arises.

There are three households (n=3, 20%) that borrow money from friends or relatives to buy food, while another household (n=1, 7%) buys food on credit from the local spaza shop twice a month. Only four households (n=4, 30%) borrow food items such as maize meal, cooking oil, vegetables, milk and sugar from friends, neighbours or relatives. The food borrowed is returned when available, with the exception of household 10a, since they depend on handouts. Thirteen households in the community do not practice food bartering because they are not familiar with the practice or how it is applied. Two of the households practice bartering of food once a month whereby they exchanged sugar for tea. The first household's members skip meals when they do not have food or money to buy food. In the third household, the daughter skips meals because of lack of appetite. In the whole community, eight households reduce the quantity of food. Generally, the most popular food coping strategies used during times of food scarcity, listed in a descending order, are switching to more affordable or cheaper food, gathering wild food, consuming seed stock, buying food on credit and reducing food portion size.

As mentioned earlier, there are no universal food coping strategies. This study, therefore, justifies this statement since the Oranje farm households rarely borrow food or money to buy food, unlike the Bangladesh community who ranks the same strategy as high since they are using it most of the time (del Ninno *et al,* 2003:1220).

The total average score of each respondent is calculated in order to determine the status of food security level of the community (Table 4.11).

TABLE 4.11: SEASONAL AND YEARLY COPING STRATEGIES INDEX (FCSI) SCORE

HH No n=13	Respondents Number n=13	BMI	Assess-ment of BMI	Total food coping score for:					Total mean food coping score	Assessment of cut-off Value ≤55
				Late summer	Autumn	Winter	Spring	Early summer		
1	1	39.78	Obese	98	57	70	136	25	77.2	>
1	2	32.03	Obese	82	33	90	24	24	50.6	<
1	3	38.09	Obese	93	27	47	39	30	47.2	<
2	4	48.28	Obese	102	122	22	117	48	82.2	>
3	5	27.33	Overweight	40	42	58	48	57	49.0	<
4	6	31.62	Obese	36	66	39	72	26	47.8	<
5	7	18.89	Normal	7	60	39	30	15	30.2	<
5	8	41.09	Obese	129	12	100	83	84	81.6	>
6	10	23.56	Normal	50	113	72	30	42	61.4	>
8	12	33.64	Obese	56	39	116	12	28	50.2	<
9	13	33.64	Obese	12	30	34	12	16	20.8	<
10	15	41.08	Obese	52	36	14	48	57	41.4	<
12	19	29.40	Overweight	19	21	90	29-	15	34.8	<
Means		33.73		59.7	50.6	60.9	52.9	35.9	51.88	

- the respondent was not available and therefore ignored during calculation
-BMI body mass index
-55 is the cut off value that is associated with a food secure status

The total mean food coping score of an individual is obtained by adding together the total food coping score of the five seasons, then dividing the total score by the number of seasons. The total mean food coping score of 55 depicts that the household has a fairly moderate level of food insecurity (Maxwell *et al*, 2003:32). The total mean food security status of this community shows a pattern that gives an impression of food availability improvement due to environmental changes, from food scarcity seasons (winter 60.9 and late summer 59.7) to food abundance seasons (autumn 50.6, spring 52.9 and early summer 35.9).

The respondents of the first households (respondents 1, 2 and 3) and fifth (respondents 7 and 8) have different total coping strategy index scores. Respondents 2, 3 and 7 have a total FCSI score of 50.6, 47.2 and 30.2 respectively. They all have the opportunity of eating some of their meals from the food prepared for the guests at the guest house. Respondents 1 and 8 rely on their households' food availability since they are not employed, thus their FCSI score is 77.2 and 81.6 respectively. Respondents 1 and 8 have a coping strategy index score that is above 55 in four out of five seasons, while respondents 4, 11 and 16 experience a coping strategy index score that is above 55 in three seasons. None of the six respondents with a coping strategy index score that is above 55 in three to four seasons are employed.

The best seasons for the food secure households is early summer, with the exception of only two respondents with 57 FCSI score, autumn, with two respondents with 60 and 66 FCSI score, and Spring, with one respondent with 72 FCSI score. Their bad seasons are late summer with a FCSI score ranging from 57 to 93 for three respondents. The food insecure households have only one good season that is early summer with a FCSI score of 84 and 127 for two respondents. Late summer has eight respondents with a FCSI score that ranges between 60 and 205, autumn with a FCSI score between 57 and 133 for seven respondents, winter with a FCSI score that ranges between 66 and 156 for seven respondents, while spring has five respondents with a FCSI score that ranges between 83 and 283.

4.5 NUTRIENT INTAKE

The results of the analysis of the women's dietary recall are presented in Tables 4.12 and 4.13. The macronutrients, fibre and the selected minerals are summarised in Table 4.12 and selected vitamins are presented in Table 4.13.

TABLE 4.12: MACRONUTRIENTS, FIBRE AND MINERALS INTAKE (24- HOUR DIETARY RECALL)

	Nutrients																	
	Energy		Protein		Fat		Carbohydrates		Fibre		Calcium		Iron		Zinc		Iodine	
	RDA	% RDA	RDA	% RDA	RDA	% RDA	RDA	% RDA	RDA	% RDA	RDA	% RDA	RDA	% RDA	RDA	% RDA	RDA	% RDA
	8400 kJ	100	46 g	100	-	-	-	-	-	-			1000 mg	100		100 mg		100 µg
Respondent	Intake	% RDA	Intake	% RDA	Intake	% DG	Intake	% DG	Intake	% DG	Intake	% RDA	Intake	% RDA	Intake	% RDA	Intake	% RDA
13	6059	72	37.4	**81.3**[r8]	50.5	75	201	73	8.3	**41.5**	422	**42**	3.5	**19**	4.1	**51**	45	**30**
7	9416	112	84.4	183	92.5	138	255.5	92.8	12.5	**62.5**	0.11	**0.01**	7.7	**42.7**	9	112.5	44	**29**
19	4906	**58**	28.8	**62.6**	32.5	**48.5**	180.1	**65**	8.7	**43.5**	577	**57.7**	2.7	**0**	4	**50**	13	**8.6**
15	4875	**58**	18.6	**40**	52.8	78.8	144.3	**52**	9	**45**	32	**3.2**	2.5	**13.8**	2.9	**36**	6	**4**
3	2096	249.5	115.2	250	243.4	363	563.6	204.9	24.3	**121.5**	309	**30.9**	13.8	76.6	15.6	195	38	**25**
6	1345	160	65.1	141.5	117.3	175	449.6	163	21.7	**108.5**	0.12	**0.01**	13.4	74	7.3	91	40	**28.6**
5	8572	102	49.7	108	38.5	**57**	191	69	8.8	**44**	404	**40**	13.8	76.6	8.4	105	2	**1.3**
12	7075	84	39.6	86	31.6	**47**	294.3	107	13.4	**67**	367	**36.7**	4.5	**25**	4.5	**56**	10	**6.6**
2	7570	90	55.8	121	61.1	91	239.4	86.9	16.8	**84**	0.11	**0.01**	5.1	**28**	7.1	88.7	30	**20**
10	8763	104	63.6	138	59.9	89	301.3	109.5	19.9	**99.5**	527	**52.7**	6.5	**36**	9.8	122.5	22	**14.6**
1	4203	**50**	30.8	**66.9**	14.8	**22**	177.2	**64**	7	**35**	428	**42.8**	12.6	70	7	87.5	8	**5**
8	7522	89.5	47.3	102.8	8.9	**13**	198.1	72	6.6	**33**	470	**47**	13.2	73	9.4	117.5	9	**6**
4	8962	106.6	72.1	156.7	26.2	**39**	369.6	134	28	**140**	415	**41.5**	9	**50**	7.6	95	17	**11**
#Dietary Guideline Recommendation	8400	100%	75g	15% tot kJ	67g	30% tot kJ	275g	55% tot kJ		20g/ day		-		-		-		-

* Intakes are considered inadequate if lower than the 2/3 cut-off point (67%) of recommended dietary intake is consumed (see values in bold).
# Where no RDA is indicated, recommendations from the dietary guidelines are considered.

TABLE 4.13: VITAMINS INTAKE (24- HOUR DIETARY RECALL)

	Nutrients											
	Vitamin A		Folate		Vitamin B^3		Vitamin B^6		Vitamin B^{12}		Vitamin D	
	RDA	% RDA	RDA	% RDA	RDA	% RDA	RDA	% RDA	RDA	% RDA	RDA	% RDA
	700 µg	100	400 µg	100	14 mg	100	1.3 mg	100	2.4 µg	100	5l µg	100
Respondent	Intake	% RDA	Intake	% RDA	Intake	% RDA	Intake	% RDA	Intake	% RDA	Intake	% RDA
13	208	**29.7**	136	**34**	3.1	**22**	0.3	**23**	2.1	87.5	4.9	92
7	915	130	276	69	16	114	0.1	**7.6**	3.8	158	0.7	**14**
19	305	**43.5**	82	**20.5**	3.1	**22**	0.3	**23**	1.7	70.8	1	**20**
15	10	**1**	71	**17.7**	4.4	**31**	0.1	**7.6**	0.4	**16.6**	0	**0**
3	286	**40.8**	126	**31.5**	30.1	215	0.4	**30.7**	2.8	116.6	0.7	**14**
6	0.11	**0**	302	75.5	12.6	90	3	**230.7**	2.1	87.5	5	100
5	756	108	145	**36**	16.9	120	0.4	**30.7**	1	**41.6**	0	**0**
12	302	**43**	69	**17**	3.7	**26**	0.4	**30.7**	1	**41.6**	0	**0**
2	490	70	156	**39**	6.2	**44**	0.7	**53.8**	3.6	150	0.5	**10**
10	546	78	153	**38**	11.3	80.7	1.1	84.6	3	125	2.4	**48**
1	841	120	154	**38.5**	9	**64**	0.9	69	0.9	**37.5**	0.6	**12**
8	0.156	222.7	246	**61.5**	17	121	0.7	**53.8**	6.5	270.8	0.1	**2**
4	12	**1.7**	167	**41.7**	19.2	137	0.2	**15**	0.3	**12.5**	0.4	**8**
#Dietary Guideline Recommendation		469		268		9.3		0.9		1.5		3.4

* Intakes are considered inadequate if lower than the 2/3 cut-off point (67%) of recommended dietary intake is consumed (see values in bold).

Table 4.12 provides the results of the macronutrient, fibre and minerals intakes. Most respondents had adequate energy intakes. All (100%) respondents had energy intakes higher than 50% of the RDA and only three of those respondents' intakes we below 67%. A sufficient intake of energy prevents the protein intake from being compromised and used as an energy source. The protein intake of ten respondents was adequate since it was above 67% of the RDA. If, however, the higher value of the dietary guidelines is taken into consideration, then seven women had intakes lower than 67% of the goal intake. Nearly half of the respondents (n=7) consumed less than 67% of the 30% recommended fat intake, and two women (respondents 3 and 6) had very high intakes. The fat intake of respondent three was contributed to by the fried sausages that were consumed during breakfast and supper. Respondent 6 consumed French fries during lunch. Only three respondents consumed less than 67% of the recommendations, but all consumed at least 52%. All the respondents had intakes below 67% of the recommended intakes for calcium, iodine and fibre. Only a few respondents (n=5; 35%) had iron (Fe) intakes above the 67% cut off point, thus indicating

poor meat consumption. The mean zinc intake of n=4 (30%) of the respondents was lower than the RDA, thus confirming the poor intake from the animal proteins. All respondents' iodine intake was lower; however, iodized salt's contribution was not taken into consideration. The consumption of iodized salt to improve iodine intake was mandated by law in South Africa in 1995 (Department of Health and UNICEF, 1998:03; Hatting *et al,* 2008:435).

Table 4.13 indicates that the mean Vitamin A intake of seven women (53%) was lower than the RDA. Most of the respondents had low intakes of vitamins B^3 and B^6, as well as vitamin D, while a few respondents had adequate intakes of vitamin A. Nearly all the respondents' (84%, n= 11) folate intakes were lower than the RDA. The mean intake of vitamin B^3 (n = 6, 46%), B^6 (n =10, 76%), and B^{12} (n = 5, 38%) were lower than the RDA which all pointed to a very poor variety in the diet. The mean Vitamin D intake of twelve (92%) respondents was lower than the RDA, which confirmed the poor intake of fat and a limited intake of dairy products.

4.6 DISCUSSION OF THE RESULTS

4.6.1 Socio-economic status

The rapid transition taking place in South Africa causes problems of adaptation, mainly for the poor regarding their often deteriorating socio-economic conditions (Lemke, 2005:845). Farm workers are the most vulnerable South African work force, earning the lowest wages even though agriculture provides about 11% of the formal employment and 27% of the informal employment, thereby constituting an important economic sector (Lemke, 2005:846). Their poor economic status is guided by the fact that they are neither non-urban nor non-rural residents hence they are disadvantaged in terms of the delivery of basic needs (Bundlender, 1999:201). The socio-economic status, as well as the women's employment rate, as outlined on Table 4.1, hinders a diversified diet in their households. Households with more members have the highest rate of food poverty. Thus Rose and Charlton, (2001:386) state that "higher food poverty rates are found in decreasing income and increasing household size"

Twelve respondents have a monthly income of less than R1000.00 with additional benefits such as a house, water and maize meal. Most households are food insecure since they spend between R100.00 and R300.00 on food per month; this implied that each household

member only spends R20.00 to R33.33. This includes farm employees, as well as the ones who depend upon the security grants. It is evident that the bulk of the South African population spends relatively little on food (Rose and Charlton, 2001:387). For many of these households, purchasing enough nutritious foods is not possible as it could strain their budget. The employees on Oranje farm are remunerated differently, as displayed in Table 4.1, since their duties are not the same. A similar trend is observed in the Western Nepal community, whereby it is mentioned that the scale of pay depends on the task undertaken, as well as the gender of the labourer, as tasks requiring the most skill and strength command high wages (Panter-Brick and Eggerman, 1997:194). A large percentage of employees are males. As in other countries, this is influenced by patriarchal beliefs (Hendricks, 2002:54). This practice results in most women mainly depending on the income of their male partner, which influences the location of resources within the household, probably resulting in limited decision making power of women (Kruger *et al*, 2005:834).

At the time of this study, the most paid employee was a female who was not a typical farm worker, since she was rendering specialised services in the guest house and earned R650.00, while the male earned R600.00. Thus the most paid farm employee was a male. A similar trend was observed in a study on Ventersdorp farm which showed that female farm workers earn much less than male farm workers (Lemke, 2005:846). The salaries of both females and males of Oranje farm employees are higher in comparison to the Ventersdorp district farm workers who earned R500.00 (females) and R544.00 (males) (Kruger *et al*, 2005:832). Oranje farm gardeners earn R420.00, while cleaners and cooks in the guesthouse receive a salary between R296.00 and R650.00. The low earners are the ones with less working hours. The one who milks the cow receives R150.00. The herdsmen's salary ranges from R300.00 to R600.00. Those who plough the fields earn R400.00 and the driver's salary is between R400.00 and R600.00. The remuneration indicates clearly that the employer do not comply with the South African Labour Relation Act in relation to remuneration. In 2003, the government introduced the minimum wage of between R650.00 and R800.00 per month for farm employees in order to improve their economic situation (Lemke, 2005:846; South African Department of Labour, 2003:01). Still this recommendation is not sufficient to combat poverty since it is below R1000.00. According to Oldewage-Theron, Dicks and Napier, (2006:800), a monthly salary of less than R1000.00 is an indication of poverty

4.6.2 Food coping strategies

When confronted with a food shortage that results from a poor economic status that limits or changes access to food, respondents make compromising changes to their diet by employing food coping strategies. This community's ranking and weighting of the food coping strategies that they employ is not the same as the ranking done during the Kenya Pilot Study (Maxwell *et al*, 2003:13). This community ranks their food coping strategies as least severe, severe and very severe and excludes the moderate level. The food coping strategies such as borrowing food, buying food on credit, sending household members to eat elsewhere and feeding other household members at the expense of others are weighted at moderate level (Maxwell *et al*, 2003:13). This community weights the same food coping strategies differently: borrowing food, sending household members to eat elsewhere and feeding other household members at the expense of others are assigned as severe, while buying food on credit is on the very severe level.

The FCSI score indicating food security, with scores below 55 for an individual respondent, is influenced by various determinants such as meals eaten away from home, the number of household members that are employed and easy access to food. Respondent 13's FCSI score is a low 20.2 because she has daily access to a variety of food since she has a spaza shop and three household members, including herself, that are employed. Respondent 7's FCSI score is 30.2 as she resides with her husband, their combined salary is R1225.00 and she is permanently employed, thus she eats most of her meals at work. Respondent 19's FCSI score is 34.8 as she resides with two household members who receive security grants that amount to R1510.00 when combined with the respondent's salary. She is also permanently employed, thus she eats most of her meals at work. Respondent 15's FCSI score is 41.4 even though she relies on handouts.

The coping strategy index scores of respondents in some instances differ even though they employ the same coping strategies. This is due to the frequency in which the strategy is applied, as well as the severity of the strategy (see Table 4.7). Respondents 1 and 2 employ the same strategies, but their individual scores differ. This is influenced by the fact that respondent number 1's average score for strategy number 9 is low, meaning she employs it once or twice a week, while respondent number 2 employs the same strategy three to four times a week. Spring season for respondent 1 is a bad period since she has to employ five coping strategies 3 – 4 times a week and three of them are of a severe level. Therefore, the status of a household's food security level is not only depicted by the type of food coping strategy applied, but also by the frequency and severity level of food coping strategy. Eating less preferred or cheap food and gathering wild food, are commonly administered in all

seasons. Wild food are abundant during the rainy season when they are found growing in the wild or as weeds in cultivated areas and they are consumed while still fresh and during dry seasons they are only available as dried. The method used to preserve the wild leafy vegetables is drying by exposing the cooked or raw leaves to the sun. This method is found to be the same as the one that was employed by the Swazi household in ka-Mantsholo (Kgaphola and Viljoen, 2000:72). Consumption of seeds is employed during early summer and winter, while buying food on credit is used mostly during autumn and spring. The food coping strategy (eating less preferred or cheap food) impacts the respondents' nutritional status differently. Chicken feet have a negative impact since their fat content is low, thus resulting in a low mean fat intake. On the other hand, it is positive since the same types of food items mentioned above have the same nutrients as the costly ones, such as meat. The other contributing factor to their low fat intake is the large starch consumption and poor meat intake.

In some instances, a nutrient deficiency is not caused by poor intake, but there are other contributing factors such as dietary inclusion of nutrient absorption inhibitors such as phytates, polyphenols and tannin (Hatting *et al,* 2008:435) For example, Savage King and Burgess (1995:36) state that "absorption of iron can be inhibited by tea since it contains tannin while deficiency of vitamin D affects the absorption of calcium." The above statement explains the reason why this community's iron and calcium nutritional status is low even though they have subsidised good sources (food items) that contain the nutrients of which they are deficient. The findings indicate that this community consumes too much tea with little or nor milk and they eat more leafy vegetables that do not contain bio-available iron.

Of the total community, only five respondents (38%) have reported that they sometimes run short of certain food items. The food items that most respondents have are maize meal, as well as a limited quantity of a variety of relishes. Stiff maize meal porridge is the basic food item used as a staple food in this community, thus it was mostly consumed twice per day. Similar results are reported from the study of the Swazi food habits conducted by Kgaphola and Viljoen (2004:18). The intake of stiff porridge is always higher in the farm residents compared to the residents in the rural, informal settlements and middle class urban areas (MacIntyre *et al*, 2002:245). This supports the fact that food insecure households have a limited variety of food that results in the consumption of high energy and low cost foods (Adams *et al*, 2003:1073). Stiff porridge is nearly always available because the employer donates maize meal to all employees. Only n=3 (23%) respondents have reported a maize meal shortage. The first household receives 120kg of maize meal from the employer for feeding five members, as well as using the leftover maize meal for preparing traditional beer. When faced with a maize meal shortage, they borrow maize meal from friends or relatives

and replace it at the end of the month. The second household receives 160kg of maize meal as a payment in kind to feed 11 members and pigs. When there is a maize meal shortage they buy bread, depending on the household's financial status. The third household, exempted from the benefits since it is without a farm employee, did not explain how they cope when they have a shortage. Out of 13 respondents only 5 (38%) respondents have reported a vegetables shortage. A shortage of fruits and vegetables worsens as food insecurity increases. This is evident in the study in a rural New York state country (Kendall, Olson and Frongillo, 1996:1022). A total of 6 (46%) respondents eat small portions during food shortages in favour of the children and income earners, especially males. This behaviour could be guided by the practised food behaviour, as it is evident amongst the Swazi households, as reported by Kgaphola and Viljoen (2004:17), that have indicated that the head of the family (in most instances the male) is fed first.

Seasonal and persistent cycles of food insecurity are a major concern in South Africa (Hendricks 2002: 53). From Table 4.11 it can be ascertained that out of five seasons that were selected for collecting data about household food security it was found that only three seasons, namely early summer, autumn and spring are better since most households indicate to be food secure. This is justified by the FCSI score that is below 55, the cut off point. It can further be explained by the fact that the spring season is the time whereby plants begin to grow and people start gathering the little green leaves that are acceptable and consumable according to their customs. These households employ different food coping strategies 3-4 times per week. Even though the frequency of the employed food coping strategies is 3-4 times a week, they do not contribute much to their FCSI score, since they rank at least severe level. Food is plentiful during early summer when an abundance of fruits, vegetables and wild leafy vegetables are available. Thus, only three respondents' FCSI score is above 55; the highest is 84 for respondent 8. They are moderately food insecure because they have employed fewer of the very severe levels and more of the least severe and severe food coping strategies. In late summer and autumn there is a decline of food availability since it is before the dry winter season., Hence five respondents' FCSI score is above 55; the highest FCSI score is 122 for respondent 4. During winter there is a shortage of food as most food items are out of season. The results of this current study are similar to the findings of Panter-Brick and Eggerman (1997:193), indicating that the Western Nepal community experiences food shortages in winter that ends with the maize harvest during early summer. During the spring season, four respondents' FCSI score is above 55; the highest FCSI score is 136 for respondent 1. Lack of knowledge contributes to their poor diet because even though during early summer there was an increase of a wide range of food, they usually preserve wild leafy vegetables and fruits, thus resulting in food shortages during the dry seasons.

4.6.3 Nutritional intake

Micronutrient deficiency is a significant nutritional and public health challenge. Hence according to Hatting *et al,* 2008:431) more than 2 billion people are at risk of iron, vitamin A, iodine and other micronutrient deficiencies. The nutritional intake data is drawn from the nutrient intake presented in Tables 4.12 and 4.13 (24- hour recall). A limitation of this data is that only one 24- hour recall was used to assess dietary intake. However, the 24- hour recall data from this community gives a clear indication that poor populations in developing countries live on a diet that is predominantly based on starchy staples, often including little or no animal products, as well as few fruits and vegetables (Ruel, 2002:01). Seasonal availability and accessibility had been observed to be the influence on fruit consumption since the fruits (peaches) that the respondents indicated in the 24- hour recall were in season at the time of study when the 24- hour recall was conducted (early summer). With reference to the community of this particular study, it is evident that they still prepare their meals in an African style, whereby little or no fat is added during cooking or used as a bread spread and high carbohydrates and plant proteins are consumed (Steyn and Nel, 2006:04). The low fat intake practice is consistent with the findings in the study conducted by McIntyre *et al* (2002:251). This is an indication of a low intake of animal products. The other contributing factor for low fat intake is the scarce/low use of fat in cooking relishes or as a spread for bread. This finding is contrary to the study of the Swazi food habits that report increased utilization of fats in food preparations, since they are adopting Western style food habits (Kgaphola and Viljoen, 2000:72). MacIntyre *et al* (2002:251) reports similar findings with additional information by stating that in the North West it is evidently found that the farm workers' nutrient intake of calcium, fat and iron are below the RDA.

Most respondents (n=10, 76%) report that their eating pattern is the same during the week and weekends. Similar results are observed in the study of the Swazi food habits, whereby all respondents report that the composition of breakfast is the same during weekdays and weekends (Kgaphola and Viljoen, 2004:18). The basic relishes used in this study are varied with chicken feet, onion, tomatoes, eggs and a limited variety of wild green leafy vegetables that provide a low micronutrient intake. This community uses the same method of cooking porridge. These results are contrary to the findings of Swazi households in that even though most of their meals consist mainly of porridge, it is prepared differently as stiff or phuthu (maize meal porridge cooked in such a way that it's texture resembles bread crumbs) porridge (Kgaphola and Viljoen, 2004:18).

Three respondents, namely 2, 7 and 19, who report that their eating habits are different on weekend, are employed at the guest house and their salaries ranged from R300.00 to

R650.00. Their food habits are influenced by their work place, as it exposes them to a variety of food items which they include in their diet, thereby expanding their dietary variety. The respondent's FCSI score indicate that they are food secure since it is below 55. It is evident that availability and easy access to food is important to alleviate hunger, as well as improve the dietary intake of individuals (Ruel, 2002:31). This statement is supported by the above finding. The food items consumed on weekends are samp, fish, eggs, cabbage, tomatoes, onions, green beans, carrots, custard and jelly, porridge, meat and milk. These food items do not differ much from the ones consumed during the week, thus the community's diet needs to be diversified in order to provide high quality diets. If this weekend diet is consumed by other respondents besides these three (2, 7 and 19) respondents, it would not have much impact on their nutritional status. The most consumed beverages are tea (with/without milk) and the home made *mageu*.

Data from the 24- hour recall indicates that the top eleven, most frequently consumed food items in the community are stiff maize meal porridge, wild leafy vegetables, brown bread, sugar, tea, milk, tomatoes, onions, chicken feet or liver, and rhubarb. These food items are sorted in descending order according to the percentage of participants who reported, but not according to the quantity consumed. Stiff maize meal porridge, wild leafy vegetables, brown bread, sugar, tea, milk, tomatoes and onions are food items that all respondents have reported. Other items such as margarine (not mentioned above), chicken feet or liver, and rhubarb are consumed by few respondents.

These results are not different from the existing data of the National Food Consumption Survey (NFCS) on children that states the first five food items above as food most commonly consumed (Labadarios, Steyn, Maunder, MacIntryre, Gericke, Swart, Huskisson, Dannhauser, Vorster, Nesmvuni and Nel, 2005:533). With a few exceptions this pattern appeared to be fairly consistent in all provinces in South Africa (Labadarios *et al,* 2007:253) This finding thus supports the existing information that states that "poor households often cope with poverty by adopting a very monotonous diet of cheap and easily available foods that may nevertheless address their basic nutritional needs and prevent them from going hungry" (Rose and Charlton, 2001:387). However, although they may not be hungry, their nutrition security is compromised due to the fact that many respondents have intakes lower than 67% of RDA for most micronutrients. Out of fifteen nutrients reported, ten of the thirteen women have intakes below 67% RDA for six or more nutrients. For example, their calcium content is low due to the fact that they used a small amount of milk (between 50ml and 300ml) per day. When milk is available, most respondents add 50ml to tea, whereas 300ml is used as a relish or drink. A similar trend was reported by Rose *et al*, as quoted by Ruel (2002:31) during a research conducted in Accra, whereby it is stated that the amount of milk

in tea is not considered sufficiently high to count as a dairy product that can add to adequate nutrient intake. The status quo of the Oranje farm community's poor milk intake is due to reasons that their milk are not investigated. It is not that milk is a scarce commodity, since it is freely available and reported that it is sold at a subsidised price by their employer. In comparison to the RDA for calcium of 1000mg, the sample appears to be at high risk of calcium deficiency since their mean intake is less than half the recommendation. Their low vitamin A intake is not different from that of the children that are reported by the South African National Food Consumption Survey (SANFCS) (Labadarios *et al*, 2005:533).

Although this data is not validated and provides only information on one 24- hour recall, the problem of practicing food coping is the same over the period of one year. Therefore, it would be expected that their nutritional intake may not have improved. The Swazi households use a variety of relishes such as meat and legumes among others, but mostly green leafy vegetables. This practice is the same as that of the Oranje farm households, except that the Swazi households add peanuts to the leafy vegetables, thus improving their protein intake (Kgaphola and Viljoen, 2004:18)

Six, four and three respondents consume three, two and one meal(s) per day respectively out of seven meals period (early morning, breakfast, mid morning, lunch, mid afternoon, supper and late night snack). Eight (61%) respondents have breakfast that mostly constitutes milk, porridge, margarine, tea and bread. Six (46%) respondents have lunch, six meals of which consist of mainly porridge and milk. Seven (53%) respondents have supper. For five of them the meal consists of porridge, relish and tea. Although a large proportion of the group adds tomato, potatoes, onion and oil when cooking the relish (meat or green leafy vegetables), the quantities are too small to improve their nutritional content (Rose *et al* as quoted by Ruel, 2002:31). Similar observations are made with regard to the North West Province communities (Vorster, Venter, Wissing and Margetts, 2005:482; Kgaphola and Viljoen, 2000:73).

4.6.4 Anthropometric data

By using BMI as a measure of weight status, eleven women from both food secure and food insecure households are found to be at nutritional risk, since their BMI's are indicative of overweight (BMI 25-29.9) and obesity (BMI >30). These risks for non-communicable diseases (NCD's) namely overweight and obesity associated with food security or food insecurity, is evident in the North West Province and the California Women's Health Survey 1998-1999 communities (Vorster *et al,* 2005:480; Adams *et al*, 2003:1072). Fifteen percent

(n=2) of the respondents, each from the food secure households and food insecure households, have a normal (18.5-24.9) BMI (Matla, 2008:57). According to Hampl and Rick Hall, (2002:920), "overweight status among women result due to the fact that food that is sufficient it's not always the kind of food people would want to eat." The rate of obesity (BMI-30) of the sample is between 33.64 and 48.28. There is an association between household income (that contributes to poor dietary diversity), food coping strategies and measures of obesity. Similar findings are evident in a research study by Kruger, Venter, Hester, Vorster and Margetts, (2002:422).

This community is moderately food insecure during three seasons (early summer, autumn and spring) as the mean value ranges between 35 and 52.9, while during late summer and winter are around 60. The BMI mean is moderate too, but not good for health since obesity among women is associated with chronic diseases, especially coronary heart disease (Kruger et al, 2002:422). From the data it is observed that the level of obesity and overweight is due to sufficient energy intake and may also e coupled with a poor level of physical activity. The findings are consistent with other nutrition studies and research conducted in South Africa. It is pointed out that physical inactivity, as well as being content about being obese, are the major determinants of obesity in most black women (Kruger et al, 2002:422). In African culture, obesity is regarded with less disfavour in the case of women (Walker et al, 2001:369). Black women prefer to remain obese since thinness is associated with illness and now with HIV/AIDS (Kruger et al, 2002:493).

In conclusion this community is characterized by more men linked with permanent employment while most women engage in casual jobs only. Therefore, more households are food insecure since these women have less influence in decision making that includes type of food to purchase. Food insecurity may limit the variety of foods available and result in consumption of high energy as well as cheaper food items that will replace meat such as bones, [r9] and chicken feet. It is evident that the diets of households that employ food coping strategies are deficient in a variety of nutrients, mostly micronutrients, since their diet consists of fewer fruits and vegetables (Kendal et al, 1996:1022). Thus Panter-Brick and Eggerman (1997:196) state that "food shortages are often associated with changes in the quality or quantity of food intake". A fundamental strategy to address micronutrient deficiencies in resource-poor communities is to increase the availability of, access to, and ultimately the consumption of foods that are rich sources of micronutrients. This could be achieved through food production at household level (Faber et al, 2007:407)

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 EXECUTIVE SUMMARY

The study was conducted with the intention to identify the different food coping strategies employed during food shortages and to provide an understanding of how the employed strategies impact individual dietary intake. Women of childbearing age targeted for this study were from the farm worker households on Oranje farm. This farm is located in a valley created by the Maluti and Rooiberge mountains in Orange Free State Province in South Africa. The women/caregivers were selected since the available data indicates that amongst the total South African population that is food insecure, women and children are the most vulnerable, especially those living on farms (Department of Agriculture of the Republic of South Africa, 2002:22). The research participants, being all women of childbearing age, were recruited from a gathering that was held to discuss the larger research project. The researcher used this opportunity to invite the women to participate in this part of the research project and to detail the process of the research.

The research was addressed through a cross-sectional survey, using both qualitative and quantitative techniques. Face-to-face interviews as a means of questionnaire completion were conducted from the respondents' homes in the language of the subject's choice, being Sesotho due to a low literacy level. The data was collected by the researcher personally. This impacted the data since the researcher was able to probe for more information by observing the status of the respondent's environment. The following four measuring instruments were used:

- A structured questionnaire on food coping strategies
  This tool was designed to gather information on socio-economic status, support group and means of accessing food.

- A previously validated Food coping strategy index questionnaire (Maxwell[r10] et al, 2003:06)

All knowledgeable women in the household regarding food preparation and distribution within the household were asked to complete the FCSI instrument for seven days. This was done to establish the frequency and severity of the food coping strategies that are employed during food shortages in the five seasonal periods and collectively over a year. Information on both frequency and severity were then combined in a single score which is the indicator of the household food security status. The desirable score is 55 or lower.

- Observation method

  This method was used to compile field notes that were used only to verify the responses concerning the types of food the respondents had reported on the 24-hour recall questionnaire, as well as the other practices relating to food purchasing.

- 24-hour dietary recall questionnaire

  A 24-hour dietary recall questionnaire that consists of seven meal periods, as well as the additional food items consumed on weekends, if they differ from the ones listed within the seven meals. The former part of the questionnaire is aimed at assessing dietary intake, while the latter part is included to assess dietary diversity. Raw data were coded, computed and analysed.

The results of this study indicate that food coping strategies are employed by the whole community (both food secure and insecure households) for various reasons. The available food prescribes the type of strategies used. Thus, out of twelve coping strategies, only five food coping strategies are mostly employed by this community. These strategies impact the micronutrient intake of each respondent, since they have a limited food variety to choose from. The calcium and iodine intakes were low for all respondents. Most respondents' intakes of vitamin B^3, B^6 and B^{12}, folate and vitamin D were low. Intakes of iron and vitamin A were low for eight and six respondents respectively. In conclusion, the practice of employing food coping strategies resulted in an adequate supply of macronutrients, while selected micronutrients were not sufficient.

5.2 DISCUSSION

All types of behaviour (food coping strategies) employed to acquire food is an indication of a household's food insecurity problem, but not necessarily problems of the same severity (Maxwell *et al,* 2003:06). This survey supports the findings of Maxwell (1995:09) and even

contributes an additional statement that it is not only the food insecure households that implement the food coping strategies, but even the food secure households that do. It reveals that the community employ the strategies for various reasons, ranging from expanding food choice to preventing hunger. To cite an example, a household that switches food consumption from preferred foods to cheaper, less preferred substitutes is clearly more food secure than a household that spends the entire day without food or a household that sends its members to beg for food. Thus Panter-Brick and Eggerman (1994:196) state that "food shortages are associated with changes in the quality and quantity of food intake."

The conclusion of this research is drawn from the formulated sub-problems, as stated in chapter three.

The first sub-problem concerns the type of food stress, if any, experienced by the women living in farm worker households on Oranje farm in the Fouriesburg district. Both the food secure and insecure households experience food stress (see Figure 4.11). They suffer shortage of relishes from the animal origin, variety of vegetables and fruits, as well as dairy products. In order to increase the quantity of the available food, as well as dietary diversity they employ food coping strategies. Out of twelve strategies practised, there are five most viable food coping strategies for this community, namely relying on less preferred or cheap food, buying food on credit, gathering wild food, consuming seed stock and reducing portion size. This is influenced by the fact that food coping strategies employed are guided by both the physical and cultural availability of food. This refers to what is considered to be food according to their culture from the available food items provided by their natural environment. The natural environment determines the type of plants and animals in a given geographical area (Kgaphola and Viljoen, 2000:69).

The second sub-problem concerns "altering the diet" and how this contributes to the food availability of women living in farm worker households on Oranje farm in the Fouriesburg district when experiencing food stress. Altering the diet contributes to their food availability, since they alter their diet by using less preferred and less expensive food items such as tinned fish, chicken feet, beans, milk and vegetables. They identify expensive food items as meat, thus when they employ this coping strategy, all the food items used are basically to substitute meat. Again, they believed that if they purchase the less preferred and less expensive food items they will get a large enough quantity of food that will last them until the end of the month. Data from the 24 -hour dietary recall and the food coping strategies questionnaires reveal that their diet constitutes a limited food variety hence the food items that are used to substitute the expensive ones are not different from their usual diet. The trend of using a little amount of milk may be speculated. The relatively high price of milk,

even though it is subsidised by the employer, may be the reason for poor consumption of milk by this community. In support of the above statement MacIntyre *et al* (2002:245) findings elicit that "fresh milk was consumed by the highest percentage of the respondents in the upper class urban stratum and high proportion of males in farm strata."

The third sub-problem concerns how rationing strategy contributes to the food availability of women living in farm worker households on Oranje farm in the Fouriesburg district when experiencing food stress. This community does not ration money because they do not have enough money to give each household member to buy food away from home, for example, in restaurants or cafés. Besides, they believe that if they can, they should use the money to purchase enough basic food items, such as maize meal (for those who are not employed on the farm), sugar and tea that might last them for a month. They do not ration food either because they believe in sharing the available food equally. Those who ever practice this strategy of rationing food they do so for the sake of saving enough food for the children as they are still growing and for the household members that are employed since they need energy to do work.

The fourth sub-problem concerns how the food seeking strategy contributes to food availability
for women living in farm worker households on Oranje farm in the Fouriesburg district when experiencing food stress. It is evidently clear that gathering of uncultivated leafy vegetables is a common practice for most, if not all, African cultures, especially prior Westernization (Kgaphola and Viljoen, 2000:70). Communities in Africa have a long history of using leafy vegetables to supplement their diets (Chweya & Eyzaguirre [r11]as quoted by Odhov, Beekrum, Akula and Baijnath 2006:430).The behaviour of gathering wild food increases food availability, but not variety, thus resulting in poor micronutrient intake. The land for indigenous food is not enough for this community, thus only specific plants are gathered. Similar findings are evident in the study that was conducted by Kgaphola and Viljoen (2000:70), whereby it is stated that the resettlement of the Swazi households by the Land Affair resulted in a limited availability of wild food. Food gathering as a coping strategy responds well to the community's challenge of a lack of relishes, since they are able to gather leafy vegetables, though it is not sufficient because there are no wild fruits and other vegetables. These finding are consistent with the research results of Walker *et al* (2001: 369) in the Southern African population. Gathering food is a severe food coping strategy because firstly, some of the leafy vegetables provide a high quantity of iron that is not available for absorption and lastly, the additional food items (tomato and onion) used during the preparation of these vegetables does not improve the nutritional value of the gathered

vegetables since they are used in small quantities. Lastly these leafy vegetables grow on soils of limited fertility (Shiundu quoted by Faber *et al,* 2007: 407).

The fifth sub-problem concerns how altering household composition contributes to food availability for women living in farm worker households on Oranje farm in the Fouriesburg district when experiencing food stress. This community does not practice this strategy because they do not have relatives near the farm. They do, however, share houses, but for this reason this strategy does not apply.

The sixth sub-problem concerns the other food coping strategies (buying food on credit) that contribute to food availability of women living in farm worker households on Oranje Farm in the Fouriesburg district. This is a very severe means of coping during food shortages. This community does not prefer this strategy because they are afraid that it might lead them into debt that they might not be able to repay. This strategy does not benefit them since this community is far from town, thus only a limited food choice is available from the spaza shop that is operated from the owners' small kitchen. Again the prices of these food items are generally high.

The seventh sub-problem concerns how various food coping strategies relate to the dietary intake of women living in farm worker households on Oranje farm in the Fouriesburg district. All food coping strategies that are employed either mostly or sometimes by women are feasible to alleviate poverty, but not to improve their dietary intake. The food coping strategies that are employed expose this community to a plant-based diet that is low in a number of macronutrients and micronutrients, since the nutrients contained in plants are often in a form that is not easily absorbed (Ruel, 2002:01). This is portrayed by the results from the 24- hour dietary recall that shows poor intake of micronutrients. Most women's dietary protein is adequate, but other nutrients that are found in animal origin, such as iron and fat, are inadequately supplied.

Consumption of seed stock is a very severe food coping strategy, since the seeds that are consumed are the maize grains that have the same nutrient (carbohydrates) as the stiff porridge which is consumed twice per day. Therefore, the consumption of seed stock increases the women's energy value hence the BMI of most respondents is above 25, which is an indication of overweight and obesity irrespective of whether they are food secure or not.

The women's fat and fat soluble nutrients vitamin A and D intake were low. Amongst all the good food sources of vitamin D (with the exception of a non-food item, sunshine), milk is the only food item listed as one of the 11 most consumed food items by this community. The

scenario of poor intake of animal sources such as meat, eggs, dairy and dairy products, does not only impact the protein content, but even zinc, fat, as well as vitamin B^{12}, since it is produced by micro organisms in animals (Guthrie and Picciano, 1995:461). It, therefore, gives an indication that dietary iron is contributed by plant sources of low bio-availability such as cereals and vegetables, rather than the haem iron from the animal sources.

A single food item can supply the body with different nutrients, thus a shortage of a certain food item in the diet might cause individuals to be deficient in more than one nutrient, depending on the amount of the availability of the nutrient in the food (Guthrie and Picciano, 1995:05). To cite example, zinc is one nutrient that is found in a limited range of food, contrary to protein. Meat and chicken are good sources of both proteins and zinc and if a shortage is reported, as it is with this community, then it will not be surprising to see this community show a low intake of the two nutrients. The three respondents that had a low intake of the three energy yielding nutrients (carbohydrates, proteins and fats) also had a poor intake of both iron and zinc. Iodine comes from soil. Thus people who, for example, consume small quantities of vegetables, such as the Oranje farm women, have low iodine intake. Iodine content in the soil depends upon the location, for example, inland areas especially where there are mountains, the iodine is low. This will not only impact on plants that people use as food, but it even disadvantages the animals that feed on those plants (Savage King and Burgess, 1995:40) Thus, it could result in poor nutrient content of the foods produced locally or in the environment. However, the content of iodine in the soil is not taken into consideration in this study.

Out of five seasons that were selected for collecting data with regard to food security, it was found that out of thirteen respondents there was only one respondent (13) whose FCSI score was below the 55 cut off point in all the seasons, while the rest of the respondents FCSI score range between 56 and 136 in more than two to four seasons. These respondents are from the households that display the following features: they spend between R150.00 and R550.00 for purchasing groceries, meaning that each of their household members spend between R27.27 and R110.00 on food per month; and they live with 2-11 unemployed household members, thus exempting them from receiving a donation of maize meal.

In conclusion, this study points to a serious problem of poor diversity rather than food insecurity. Due to the size of the sample, the findings of the research cannot be used to generalise all the women of farm worker households. It gives some indication of the current use of food coping strategies on which to base further research. This study indicates that there is a relationship between food insecurity and low income, food coping strategies and low dietary intake.

5.3 RECOMMENDATIONS

On the basis of these findings:

- Improvement of the farm worker households' employment rate, as well as improved salaries needs to be perceived as crucial matters that need to be addressed urgently. According to Ruel (2002:23), "there is an association between dietary diversity and household socio economic characteristics and/or food security." In support of the above recommendation, Quandt and Rao (1999:26) state that "there is higher rate of food insecurity among the poor elderly (those who lack assets such as pensions and investments) due to the fact that they divert more of their income to medical expenses rather than food." People tend to diversify their diet as their income increases, for example, they decrease the intake of staple foods, since they have a variety of food to choose from, and increase their daily intake of meat, fruits and vegetables (MacIntyre *et al*, 2002:245; Walker *et al*, 2001:369).

- The increment of income must be coupled with nutrition education to promote better choice and eating patterns in order to avoid the occurrence of chronic diseases. According to Senekal *et al* (2003:112) there is a sharp rise in the prevalence of obesity among people who seem to be better educated and financially more privileged than the general South African population.

- Donation in kind should also be varied, for example, this can be done by providing daily milk rations since most households do not have cold storage. This supply will improve their calcium intake. These findings are evident from the study of MacIntyre *et al* (2002:251).

- To nourish a household adequately there should be a sufficient quantity and variety of good quality food. Another fundamental strategy to improve food availability and vegetable consumption is to encourage agricultural productivity. This could be done through the implementation of food gardens, as land and water are available in this community. Intervention by agricultural specialists will be of use since it is indicated that lack of skills and knowledge lead to poor production. For sustainability and further guidance frequent visits by the local agricultural extension workers are recommended.

- To create an efficient and effective impact on the nutritional status, more use of food coping strategies can be achieved by encouraging the households to:

  - * Practice food bartering,
  - * Learn various methods of preserving fruits and vegetables when they are in abundance,
  - * Gather the leftovers from the fields after harvesting,
  - * Hunt for edible insects that are culturally acceptable to improve their protein intake,
  - * Purchase non-perishables, such as tinned fish and powdered milk, for those who are without cold storage facilities, and
  - * Create a fishing opportunity by filling the dam with water during dry seasons.

- Since this community is situated far from town which is a common practice of most farms in South Africa, the employer could provide subsidised transport to town bi-monthly. This will enable the community to make a wider choice of food from various shops.

- For analysis of nutrient composition the traditional and indigenous fruits and vegetables, as well as the leafy vegetables from various locations should be assigned scientific names for easy use and identification.

- To restore the dignity of people working and living on the farm they should have access to education and other opportunities of advancement so that they can obtain skills to engage in the wider economy such as buying shares on the farm

5.4 RECOMMENDATIONS FOR FUTURE RESEARCH:

The food coping strategies questionnaires should be applied to more farm worker households in different settings to enhance generalising of the results. In order to provide a reasonable estimate of the mean nutrient intake, several 24-hour dietary intake recalls need to be conducted to include both weekdays and weekend days, but also to represent the seasonal periods throughout the year. This could, for example, be done in conjunction with the food coping strategies questionnaire in the five seasonal periods.

More focused information should be gathered regarding the wild food being used by many rural communities in South Africa, as this seem to be a valuable resource to improve dietary diversity. Indigenous knowledge of nutritive values, methods of production, preservation and utilization should be imparted to the young generation. The available data state that the use of indigenous vegetables will decrease incidences of nutritional deficiency, disorders and diseases (Kwapata, and Malimo as quoted by Odhav *et al,* 2006:432).

5.35.5 LIMITATIONS AND STRENGTHS OF THE STUDY

Several limitations were identified:

- A limited number of 24- hour recalls conducted to make valid conclusions regarding food or nutrient intakes.
- Administration of a 24- hour dietary recall questionnaire in one season out of five seasons was not sufficient to investigate their food intake throughout the year and to complement the food coping strategies applied throughout the year.
- The findings cannot be generalized based on the information found as the sample was very small.

The strengths of the study were:

- Three questionnaires on food coping strategies as well as types of food consumed were used to complement each other. One for collecting data on the type of food coping strategy they employed, the second one to determine the frequency and severity of the food coping strategy employed and lastly the 24- hour recall used to note the type and quantity of food eaten.
- Food insecurity status was significantly associated with the frequency and severity of food coping strategies employed by a household as well as their dietary intake. This approach is valuable in assessing households food coping behaviour linked to household food insecurity. The FCSI were found as a useful and easy instrument to determine household food security status in communities over time.

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ADDENDUM A

FOOD COPING STRATEGIES QUESTIONNAIRE

Mark with X in the appropriate space or by writing the answer in the provided space. All your answers are strictly confidential and anonymous.

For Official Use Only

Name

V1 1-2

House No

V2 3-4

1. SOCIOECONOMIC STATUS

1.1 Is there a member of the family who is employed?

Yes	
No	

V3 5

1.2 How many members are employed?

V4 6

1.3 What type of job are they doing?

Member	Type of job

V5 7 V6 8
V7 9 V8 10
V9 11 V10 12

1.4 When are they remunerated?

Daily	
Weekly	
Monthly	
Other	

V11 13

1.5 How much does each member earn?

V12 14 V13 15-18
V14 19 V15 20-23
V16 24 V17 25-28
V18 29 V19 30-33

2. FOOD SUPPLY

2.1 Does any member get food supply from the employer?

Yes	
No	

V20 34

2.2 If yes, list and indicate the frequency and the amount of foods items received.

Food items	Frequency	Amount

V21 35 V22 36 V23 37-40
V24 41 V25 42 V26 43-46
V27 47 V28 48 V29 49-52
V30 53 V31 54 V32 55-58

2.3 Do you buy food?

Yes	
No	

V33 59

2.4 How often do you buy food?

Daily	
Weekly	
Monthly	
Other	

V34 60

2.5 What amount of your monthly income do you spend on buying food?

V35 61-63

2.6 Do you ever experience food shortage?

Yes	
No	

V36 64

2.7 What do you mean by food shortage?

V37 65-66

2.8 During which period of the month do you experience food shortage?

1st week	
2nd week	
3rd week	
4th week	

V38 67

2.9 Is it a problem if you experience this type of food shortage?

Yes	
No	

V39 68

Explain how it affects the household.

V40 69-70

2.10 List the food that you sometimes run short and explain what you do about the shortage.

V41 71 V42 72-73
V42 74 V44 75-76
V45 77 V46 78-79

2.11 Do you ever run out of food altogether?

Yes	
No	

V47 80

2.12 What do you do ir you do not have food in the household?

V48 81-82

2.13 What do you do ir you do not have food in the household?

V49 83-84

3. SUPPORT GROUP

3.1 Do you have relatives nearby?

Yes	
No	

V50 85

3.2 If yes, do they help you when you have food shortage?

Yes	
No	

V51 86

3.3 Explain how they help you.

V52 87-88

4. ACCESSING FOOD

4.1 Do you borrow money for food?

Yes	
No	

V53 89

4.2 If yes, from whom do you borrow money for food?

V54 90-91

4.3 How do you replace the money?

V55 92-93

4.4 How often do you borrow money for food?

Daily	
Weekly	
Monthly	
Other	

V56 94

4.5 Do you borrow food?

Yes	
No	

V57 95

4.6 If yes, list the food items.

Food items	Frequency	Amount

V58 96 V59 97 V60 98-101
V61 102 V62 103 V63 104-107
V64 108 V65 109 V66 110-113
V67 114 V68 115 V69 116-119

4.7 From whom do you borrow the food?

V70 120-121

4.8 How do you replace the food?

V71 122-123

4.9 Do you borrow food?

Yes	
No	

V72 124

4.10 If yes, list the food you exchange.

V73 125
V74 126
V75 127
V76 128

4.11 How often do you practice food bartering?

Daily	
Weekly	
Monthly	
Other	

V77 129

4.12 Do you rely on low cost food?

Yes	
No	

V78 130

4.13 If yes, which food items do you buy to replace the expensive ones?

Expensive Food	Less Expensive Food

V79 131-132
V80 133-134
V81 135-136
V82 137-138

4.14 What is the difference between the expensive and the low cost food?

V83 139-140

4.15 Do you somethimes feed your family with wild food from the veldt?

Yes	
No	

V84 [ ] 141

4.16 If yes, list 5 food items you usually gather?

V85 [ ] 142
V86 [ ] 143
v87 [ ] 144
V88 [ ] 145
V89 [ ] 146

4.17 Are there family members who skip the meals?

Yes	
No	

V90 [ ] 147

4.18 If yes, indicate the family member and the reason for skipping meals?

Family Member	Reason

V91 [ ] 148 V92 [ ] 149
V93 [ ] 150 V94 [ ] 151
V95 [ ] 152 V96 [ ] 153

4.19 Do some of the family members have to eat less than usual during the period of food shortage?

Yes	
No	

V97 [ ] 154

4.20 If yes, who gets a big or small portion and why?

Family Member	Reason

V98 [ ] 155 V100 [ ] 156
V100 [ ] 157 V101 [ ] 158
V102 [ ] 159 V103 [ ] 160

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ADDENDUM B

FOOD COPING STRATEGY INDEX (FCSI)

For Official use Only

Name _____ V1 [ ][ ] 1-2

House No _____ V2 [ ][ ] 3-4

CONSUMPTION COPING STRATEGY RESPONSE

In the past 30 days, if there had been times when you did not have enough food or money to buy food, how often has your family had to:		Relative frequency					
		All times? Everyday	Pretty often? -6 */week	Once in a while? 1-2 */week	Hardly at all? <1 */week	Never? 0 */week	
1.	Rely on less preferred and expensive foods?						V3 [ ] 5
2.	Borrow food, or relay on help from a friend or relative?						V4 [ ] 6
3.	Purchase food on credit?						V5 [ ] 7
4.	Gather wild food, hunt or harvest immature crops?						V6 [ ] 8
5.	Consume seed stock held for next season?						V7 [ ] 9
6.	Send children to eat with neighbours?						V8 [ ] 10
7.	Send household members to beg?						V9 [ ] 11
8.	Limit portion sizes at mealtimes?						V10 [ ] 12
9.	Restrict consumption by adults in order for small children to eat?						V11 [ ] 13
10.	Feed working members of household at expense of non-working members?						V12 [ ] 14
11.	Ration the money you have and buy prepared food?						V13 [ ] 15
12.	Skip the entire day without eating?						V14 [ ] 16

ADDENDUM C

24- HOUR DIETARY RECALL

What day was yesterday? _____

Would you describe the food that you eat yesterday as typical of your food intake?

1	Yes	2	No

I want to find out about everything you ate and drank yesterday, including water or food you pick from the veldt. Please tell me everything you ate from the time you woke up till the time you went to sleep.
Please tell me where (actual place) you ate food and how much.

Description of food preparation method	Time	Amount	Gram	Code
Early morning				
Breakfast				
Mid Morning (between breakfast and lunch)				
Lunch				
Mid Afternoon (between lunch and supper)				

Supper				
Late night snack (after supper)				

Is your eating different on weekends?	1	Yes	2 No	

If yes, please describe.

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ADDENDUM D

CONCENT FORM

RE: RURAL HOUSEHOLD FOOD SECURITY RESEARCH PROJECT

I hereby undertake to voluntarily participate in the proposed project, to answer all questions honestly to the best of my abilities and not to withhold any information that are or can possibly be of importance to the project.

I further give my consent that faecal and blood samples may be taken from my child(ren), that they may be weighed and measured and that questions regarding their usual dietary intake may be asked.

I understand that all the information retrieved from analyzing the samples and answers will only be used for research purpose and that it will be considered confidential.

Name: | | Date: | |