

**EVALUATION OF THE IMPACT OF A HOUSEHOLD FOOD SECURITY  
PROGRAMME IN QWAQWA USING A COPING STRATEGY INDEX**

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## ABSTRACT

The Free State Department of Agriculture distributed food security packages to Qwaqwa households in 2003. The purpose of distributing food security packages was to improve the food security status of poor households. Thirty households received food security packages to the value of R4500.00 each between March and May 2003. The packages were designed to include: garden fencing materials, gardening tools, winter and summer seeds, fertiliser, water hoses, twenty village chickens, chicken feed and a portable, ready made poultry cage. This study sets out to evaluate the impact of these packages distributed by the Department of Agriculture to Qwaqwa households by comparing dietary diversity, frequency of consumption, income sources, coping strategy applications and food security status. Maxwell *et al's* (2003) Coping Strategy Index (CSI) was used to determine relative food security status. Data on household demographics, food consumption patterns and consumption coping strategies was collected from 30 recipient households and 30 non-recipient households whose names were on the waiting list for food security packages in Qwaqwa.

The results of the study showed that the packages improved food security in recipient households. First, the frequency of consumption of most foods included in packages (carrot, beetroot, eggs as by-product of chicken and chicken) was higher among recipient households. Food consumption patterns improved in recipient households as more households diversified food intake. Second, some coping strategies applied by recipient and non-recipient households were similar, but the frequency of application of these strategies differed between households in the two groups. The frequency of application of

similar strategies (eating less preferred food, purchasing food on credit, visiting friends to eat with them, restricting consumption of adults in order for small children to eat, borrowing food, sending children to visit relatives, skipping entire meal eaten in a day, reducing meal sizes, and sending household members to beg) was higher in non-recipient households.

The classification of strategies according to severity levels (least severe, moderately severe, severe and very severe) was done by community members. Recipient households applied the least severe strategies and moderately severe coping strategies more than non-recipient households. Non-recipient households applied more severe and very severe strategies more often than recipient households. As a result, recipient households' average coping strategy index score was lower than that of the non-recipient households, suggesting that food security packages improved recipient households' food security status.

Lack of suitable scavenging space for the chickens and lack of knowledge of freely available chicken feed constrained the impact of the packages on household food security. Recommendations include training of extension officers and households in village chicken rearing and harvesting of chicken feed. It is recommended that the Department of Agriculture should adhere to its original plan of giving twenty-month old chicken to households and should use the Coping Strategy Index for identifying food insecure households and monitoring and evaluation of the impact of the food security programme.

**DECLARATION**

I hereby declare that the research report in this dissertation is of my own investigation. Where use has been made of the work of others, this has been duly acknowledged in the text.

Signed M. Majake  
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As research supervisor I agree to submission of this dissertation for examination:

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## TABLE OF CONTENTS

<b>ABSTRACT</b>	<b>ii</b>
<b>DECLARATION</b>	<b>iv</b>
<b>ACKNOWLEDGEMENTS</b>	<b>v</b>
<b>LIST OF FIGURES</b>	<b>ix</b>
<b>LIST OF TABLES</b>	<b>x</b>
<b>CHAPTER 1 THE PROBLEM AND ITS SETTING</b>	<b>1</b>
1.1 Statement of the research problem	2
1.2 Research hypothesis	2
1.3 Study assumptions	2
1.4 Study limitations	3
1.5 Organisation of the dissertation	3
<b>CHAPTER 2 REVIEW OF RELATED LITERATURE</b>	<b>5</b>
2.1 The concept of food security	6
2.2 Poverty and food insecurity in developing countries	8
2.3 The South African food security situation	10
2.4 How households cope with food insecurity	12
2.5 Food security interventions	14
2.6 Village poultry as an option for household food security	16
2.6.1 Village poultry as a source of protein	18
2.6.2 Statistics of poultry production	19
2.6.3 Rearing, breeding and productivity of village chickens	19
2.6.4 Feeding village chickens	21
2.6.5 Mortality of village chickens	21
2.7 Role of a home gardens in household food security	22
2.8 Methods for measuring food security	24
2.8.1 Vulnerability approaches	26

	vii
2.8.2 Assessments of dietary diversity	26
2.8.3 Experiential-based measures of food security	27
2.8.4 The Coping Strategy Index tool as a measure of food insecurity	28
2.9 Synopsis	29
<b>CHAPTER 3 THE FREE STATE DEPARTMENT OF AGRICULTURE'S FOOD SECURITY PROGRAMME</b>	<b>31</b>
<b>CHAPTER 4 METHODOLOGY</b>	<b>34</b>
4.1 Survey design	34
4.2 Population and sample selection	35
4.3 Survey materials and approaches	36
4.4 Data analysis and presentation of results	44
<b>CHAPTER 5 DESCRIPTION OF THE SAMPLE</b>	<b>45</b>
5.1 Background of the study area	45
5.2 Sample description	45
5.2.1 Household composition	46
5.2.2 Characteristic of households heads	47
5.2.3 Ownership of productive and non-productive assets	49
5.2.4 Household incomes	50
<b>CHAPTER 6 RESULTS AND DISCUSSION</b>	<b>55</b>
6.1 Food consumption patterns	55
6.2 Coping strategies	63
6.2.1 Least severe coping strategies	64
6.2.2 Moderately severe coping strategies	65
6.2.3 Severe coping strategies	68
6.2.4 Very severe coping strategies	72

		viii
6.3	Coping strategy index score	74
6.4	Coping strategies versus Coping Strategy Index (CSI)	76
6.5	CSI versus income	80
6.6	Food consumption and CSI	81

## **CHAPTER 7 CONCLUSIONS AND RECOMMENDATIONS** **84**

7.1	Conclusions	85
7.2	Policy implications and recommendations for improvement of the programme	86
7.3	Recommendations for improvement of the study	88

## **REFERENCES**

APPENDIX A	Questionnaire
APPENDIX B	Workshop attendance register
APPENDIX C	Code list and survey data
APPENDIX D	Map of Maluti-a-Phofung Municipality (FS 194)
APPENDIX E	Frequency table
APPENDIX F	T-test results



## LIST OF FIGURES

Figure 5.1:	Sample household composition, 2004, n = 60	47
Figure 5.2:	Sources of household income, 2004, n = 60	51
Figure 5.3:	Income range, 2004, n = 60	53
Figure 6.1:	Picture of a portable village chicken cage, 2004	60
Figure 6.2:	Frequency of weekly consumption of foods not included in food security package, 2004, n=60	62
Figure 6.3:	Percentage of households that never employed or have employed different coping strategies at all other levels (all the time, pretty often, once in a while and hardly at all) , 2004, n=60	63
Figure 6.4:	Frequency of application of least severe coping strategy, 2004, n=30 for each recipient and non-recipient households	65
Figure 6.5:	Frequency of application of moderately severe coping strategies, 2004, n=30 for each recipient and non-recipient households	68
Figure 6.6:	Frequency of application of severe coping strategies, 2004, n=30 for each recipient and non-recipient households	71
Figure 6.7:	Frequency of application of very severe coping strategies, 2004, n=30 for each recipient and non-recipient households	73
Figure 6.8:	Coping strategy index score of individual households, 2004, n=60	74
Figure 6.9:	Average coping strategy index scores of households, 2004, n = 60	76
Figure 6.10:	Contribution of each coping strategy to cumulative CSI score, 2004, n=30 for each recipient and non-recipient households	77

## LIST OF TABLES

Table 2.1:	Hunger risk classification of children aged 1-9 by area of residence, 1999	12
Table 2.2:	Nutrients provided by 100g (edible portion) of poultry meat, eggs and other selected staple foods in Africa (by FAO, 1998, citing FAO, 1997c)	18
Table 3.1:	Free State Department of Agriculture's food security package	32
Table 4.1:	Coping strategies grouped and ranked according to severity levels	40
Table 4.2:	List of consensus coping strategies applied by Qwaqwa households classified according to severity levels	41
Table 4.3:	Assigning scores for relative frequencies of application of coping strategies	42
Table 5.1:	Independent samples test for households composition, 2004, n=60	46
Table 5.2:	Independent samples test for characteristics of households heads, 2004, n=60	48
Table 5.3:	Independent samples test for ownership of productive and non-productive assets, 2004, n=60	49
Table 5.4	Independent samples test for household incomes, 2004, n=60	50
Table 5.5	Households whose individual members lived on an amount less than and equal and above R194.00 per month, 2004, n=60	52
Table 6.1:	Independent samples test for consumption of foods, 2004, n=60	57
Table 6.2:	Independent samples test for application of least severe coping strategy, 2004, n=60	64

Table 6.3:	Independent samples test for application of moderately severe coping strategies, 2004, n=60	66
Table 6.4:	Independent samples test for application of severe coping strategies, 2004, n=60	69
Table 6.5:	Independent samples test for application of very severe coping strategies, 2004, n=60	73
Table 6.6:	Independent samples test for CSI score, 2004, n=60	75
Table 6.7	Pearson correlation coefficients for coping strategies and cumulative coping strategy index, 2004, n=60	78
Table 6.8	Pearson correlation coefficients for sources of income and cumulative coping strategy indexes, 2004, n=60	80
Table 6.9	Pearson correlation coefficients for frequency of food consumption and cumulative coping strategy index, 2004, n=60	82

## CHAPTER 1

### THE PROBLEM AND ITS SETTING

The Free State province is among the three of the most poverty-stricken provinces in South Africa (National Department of Agriculture, 2002). It has been speculated that such high poverty in the Free State has been inherited from the two former homeland areas (Botshabelo and Qwaqwa) which, after the 1994 elections became part of the province (van Niekerk, 2000). The poverty rate in Qwaqwa was reportedly 88 percent in 1998 compared to the provincial average of 63.4 percent (Free State Department of Social Welfare, 1999). Poverty and food insecurity are interrelated as household income retards household ability to purchase enough and/or supplementary food and other basic necessities for household members (FAO, 2001a). Poor and food insecure household members are undernourished (Sharma, 1992). Stunting (low height for age) has been reported as a basic indicator of malnutrition (UNICEF, 1998). The Free State province, with 28.7 percent of children reported to be stunted in 2000, is among three provinces with the highest rates of stunting in South Africa (National Department of Agriculture, 2002). The Free State government is faced with a major challenge of addressing poverty and subsequent food insecurity in Qwaqwa (van Niekerk, 2000, p1).

As an intervention strategy aimed at improving food security, the Free State Department of Agriculture's Food Security Programme (an initiative of South African National Department of Agriculture) started distributing food security packages to food insecure households during 2003 (Free State Department of Agriculture, undated a). The package included: gardening tools, summer and winter seeds, fertilizer, garden hoses, materials for

fencing a household garden, twenty-month chickens with 20kg of poultry feed and a ready made portable poultry cage (Free State Department of Agriculture, undated a). The first distribution of packages was in March 2003 in Qwaqwa. The contribution of these packages towards improving household food insecurity has not been determined.

### **1.1 Statement of the research problem**

The purpose of this study was to use a coping strategy index to evaluate the impact of packages distributed by the Free State Department of Agriculture on the food security status of Qwaqwa households. The study compared the coping strategies employed by households and the dietary diversity of recipient and non-recipient households to test whether these food security packages contributed to improving household food security.

### **1.2 Research hypothesis**

The Free State Department of Agriculture food security packages have contributed towards improving the food security status of recipient households.

### **1.3 Study assumptions**

It was assumed that households that received the packages are aware of and practised correct food production, management, processing and preparation techniques and that these households had nutrition education, knowledge of proper child care, proper sanitation, and applied health rules. It was assumed that recipient households knew correct poultry management (disease control and feeding) techniques. It was assumed that there were not additional factors affecting the food security of households (ie. the difference between the two groups was directly due to the impact of packages).

The coping strategy index and dietary diversity were used as proxies for food insecurity and it was assumed that these were valid proxies for this diverse and complex concept. The study respondents self-reported on the coping strategies they applied and the frequency at which they applied these strategies during food shortages. Therefore, the study assumed that the study respondents were honest about the coping strategies they applied and the frequency at which they applied the strategies during food shortages.

#### **1.4 Study limitations**

The study did not conduct detailed surveys of household income and expenditure, but only baseline questions to understand characteristics of the sample. It did not assess the nutritional status of household members. Data on the consumption of chicken and eggs by recipient and non-recipient households was collected to determine the impact of the programme chickens on recipient households' consumption of chicken and eggs. However, the Department of Agriculture deviated from the original plan of giving twenty-month old chickens, to giving younger stock, and in some instances stock dominated by cocks that could only produce meat but not eggs.

#### **1.5 Organisation of the dissertation**

This chapter has outlined the background to the research problem, statement of the research problem, hypothesis, study assumptions and limits. Chapter two reviews how the concept of food security has evolved from focussing on food supply at national level to focussing at food access and availability at household level. It further reviews poverty and food insecurity in developing countries with special reference to South Africa and indicates how households in developing countries cope with food insecurity. The review discusses how

village chickens and home gardens can be used as food security intervention strategies. Finally, the chapter reviews measurement systems for evaluating household food security. Chapter 3 describes the Free State Department of Agriculture's Food Security Programme. Chapter 4 outlines the study methodology. Chapter 5 presents characteristics of sample households. Chapter 6 presents the findings and the final chapter contains conclusions and recommendations.

## CHAPTER 2

### REVIEW OF RELATED LITERATURE

It has been estimated that 75 percent of households living in rural areas of developing countries are food insecure (FAO, 1996b). Food insecure households are characterised by low incomes (Sharma, 1992) and undernourished members (National Department of Agriculture, 2002). Low incomes prevent these households from buying food and/or productive inputs (i.e. improved seeds and fertilisers) to produce their own food (FAO, 1996b). To help improve the food security status of households with low incomes, the Food and Agriculture Organisation (FAO) launched the Special Programme for Food Security (Branckaert and Gueye, 1999). The Special Programme for Food Security's strategies for improving food security have been based on establishing interventions that are suitable to local conditions. These strategies use relatively inexpensive production inputs and make efficient use of scarce available resources, but increase household food security status and household incomes (FAO, 1998). Examples of such interventions are the use of family poultry and home gardening (FAO, 1998). The potential of these intervention strategies in achieving improved household food purchasing power and nutritional status is widely acknowledged in literature (FAO, 1998; Gueye and Fallou, 2000; Silverside and Jones, 1992; Branckaert and Gueye, 1999).

However, Martin (1998) has postulated that if food security intervention strategies are to make a visible impact, they should be continually evaluated by food security programme managers. Evaluating the impact of intervention strategies provides managers with information on whether applied strategies achieve objectives or not (Martin, 1998).



Further, impact evaluations of intervention strategies help managers to adapt interventions to satisfy the changing needs and conditions of communities (Reily, Mock, Cogill, Bailey and Kenefick, 1999). Continual evaluation also alerts managers of potential problems that might undermine the impact of interventions. When food security programme managers have identified factors that might undermine the impact of their interventions, they can take actions to prevent long-term food insecurity (Reily *et al*, 1999).

The focus of this literature review is first towards developing an understanding of food security and how the concept has evolved overtime. Secondly, the review looks at the problems of poverty and food insecurity in developing countries, presents the South African food security situation and describes examples of the initiatives the developing countries have taken in addressing food insecurity. Thirdly, the review looks at the consumption coping strategies that households use when they do not have enough food for household members. Fourthly, the review includes a discussion of food security intervention strategies with a specific focus on family poultry (village chicken) and home gardening. A final section summarises the main points of this discussion.

## **2.1 The concept of food security**

Food security is a concept that has evolved considerably over time (Hoddinott, 1999, p2). Traditionally food security has referred to the overall regional, national and global food supply (Maxwell, 1995, p1). Lately, the meaning of food security has shifted from food supply to food availability, access and use at local, household and individual levels (FAO, 1996a). This shift in food security definitions occurred when heads of state and governments attended the 1996 World Food Summit. Here it was realised that large

increases in global food supply did not improve the food security status of many poor households (Saad, 1999). The summit participants reached a consensus that “food security exists when all people always have physical and economic access to enough, safe and nutritious food to meet their dietary needs and food preferences” (FAO, 1996a, p32). Physical access implies that food must be within the physical reach of households either through own production or food stores (Sharma, 1992). Economic access implies that households who do not produce all, or sufficient food, must have enough money to buy food in the market place (Sharma, 1992). Further, Sharma (1992) has asserted that a household is food secure when it has both physical and economic access to enough food for all its members and when it is not at undue risk of losing such access.

In addition, Hoddinott (1999), has asserted that household access to enough food is dependent on available labour and capital. Labour means that enough people must be present to produce food and engage in income generating activities such as sewing, knitting, and handicrafts. These people must also have sound knowledge of techniques that will enable them to maintain sustainable production (Hoddinott, 1999). Capital refers to “those resources such as land, tools for agricultural and non agricultural production, livestock and financial resources, that combined with labour, produce income” (Hoddinott, 1999, p6).

Food availability also refers to a continuous supply of food at both national and household levels (National Department of Agriculture, 2002, p16). The use of the phrase ‘food availability’ may be confusing since it can refer to supply available either at the household and/or regional and/or national levels (Riely *et al*, 1999). However, in this review, the use of the phrase, unless used in defining food security, refers to the food available at the

household level. Biological utilisation of food refers to the health side of food which means that a household should live in a healthy physical environment to avoid sickness (Diskin, 1995). This implies that those who prepare food should have an understanding of proper health care, food preparation and food preservation techniques (Hoddinott, 1999).

A household's food insecurity refers to lack of access to enough food by the household (Saad, 1999, p1). A household can suffer from chronic food insecurity (experience food insecurity for a long time) or from transitory food insecurity (experience short-term food insecurity) (Maxwell and Frankenberger, 1992). When household income sources are continually insufficient to meet food requirements, chronic food insecurity is experienced (Gladwin, Thomson, Stirling and Scotland, undated). Transitory food insecurity is experienced due to shocks such as droughts or floods (Gladwin *et al*, undated). Transitory food insecurity has been classified into two categories: temporary and seasonal or cyclical. Temporary food insecurity occurs when there are disruptions to food supply that may result from inconsistent incomes or shocks such as droughts or floods (Maxwell and Frankenberger, 1992). Seasonal or cyclical food insecurity is experienced when there are regular patterns to food insecurity, for examples, during the lean (hunger) season that occurs just before harvest or during a regular dry spell (Maxwell and Frankenberger, 1992; Boardman, undated). If household labour or capital is affected by shocks, food insecure households may loose access to regular food supplies and resources (Sharma, 1992).

## **2.2 Poverty and food insecurity in developing countries**

There is an interrelationship between poverty, nutrition and food insecurity in developing countries (FAO, 2001a). Approximately 1.2 billion people (20% of the world population)

live in poverty, while 75 percent of households living in rural areas of developing countries are food insecure (FAO, 1996b). Nutrition problems at households level are commonly associated with food insecurity (FAO, 2001a).

In developing countries, nutritional problems of children are associated with more than half of all child deaths (FAO, 1996b). For example, in Sub-Saharan Africa, 56 percent of all child deaths are related to malnutrition, and 83 percent of the deaths occur in children who are moderately, rather than severely malnourished (Bonnard, 2001, p3). In at least 60 countries, 40 million children suffer from Vitamin A deficiency (FAO, 1996b). Iron deficiency affects about two billion people worldwide (FAO, 1996b).

As incomes of poor households increase, so consumption of non-staple foods, particularly meat increase (FAO, 1996b). Bonnard (2001) has reported that as incomes of poor households increase, their food purchases become more diverse, and that they shift to higher quality foods such as meat and fruits. Thus, the obvious relations between food insecurity, nutrition and poverty suggest that interventions aimed at increasing incomes of poor households have potential to improve household food security and nutrition.

Bonnard (2001) has cautioned that increased household income does not necessarily result in improved food consumption and food security, as intra-household factors also play a role in deciding if households will spend extra income on food. One intra-household factor to consider in this matter is who earns and controls incomes within households (Diskin, 1995). It has been reported that household incomes earned and controlled by women, are more likely to be spent on food than when earned and controlled by men (Bonnard, 2001). This

implies that if interventions are to make a positive impact on food security, policy makers must make sure that interventions are directed to individuals within the households who will use them to positively impact on household food security (Coates, Webb and Houser, 2003). Involving both men and women in food security education may help both understand the importance of good nutrition and food security in a household and help resolve intra-household imbalances.

Food prices also influence the ability of poor households to buy food with increased income (Hoddinott, 1999). It has been reported that high food prices may undermine the purchasing power of poor households even if incomes increase (Diskin, 1995). Diskin (1995) has observed that increased food prices benefit net sellers (who are often food secure) and disadvantage net buyers, who are mostly food insecure households. Sharma (1992) proposed that the food costs of poor households often account for 70 percent of total expenses. Aliber and Modiselle (2002) study undertaken in South Africa (KwaZulu-Natal, North West and Gauteng provinces) to develop a system of monitoring the impact of food price volatility on household level, reported that increased food prices of basic food stuffs had adverse effects on poor households. It is imperative that the South African government should, in its attempt to reduce household food insecurity, take note of the factors contributing to household food insecurity for it to achieve its food security goals. The South African food security situation is presented in the section that follows.

### **2.3 The South African food security situation**

South African food insecurity conditions are closely correlated and linked to those of regional conditions despite being a relatively wealthier country that is in contrast nationally

food secure (National Department of Agriculture, 2002). It has been reported that nearly fourteen million (29.2%) South Africans are susceptible to food insecurity (Department of Agriculture and Land Affairs, 1997).

Stunting has been reported as a moderate public health problem in South Africa (Vitamin Information Centre, 2001). One in four children under the age of six years was stunted and one in ten was underweight due to chronic malnutrition in 1999 (Vitamin Information Centre, 2001). Widespread micro-nutrient deficiencies, such as anaemia and marginal vitamin A intakes affect between 20 and 30 percent of the country's young children (National Department of Agriculture, 2002).

Like in other Southern African countries, many members of poor households in South Africa are unemployed and have little if any income (Department of Agriculture and Land Affairs, 1997). This means that majority of unemployed South Africans may have been food insecure because they lacked purchasing power (Department of Agriculture and Land Affairs, 1997). De Swart's (2002) livelihood survey study of over 2000 households (comprising 10 544 people) in the rural Eastern Cape (Mount Frere), rural Western Cape (Ceres) and urban Cape Town (Khayelitsha and Nyanga) showed food insecurity as a problem in poor households in both rural and urban areas of South Africa. Eighty-three percent of sample households in Mount Frere were more food insecure than 81 percent of urban households in Cape Town and 69 percent of Ceres rural households (de Swart, 2002).

Children in South Africa's former homeland areas display more food insecurity than children in formal and informal urban areas, commercial farms and South Africa as a whole

(National Agricultural Marketing Council, 2002). More than 52 percent of South Africa's children aged between one and nine years reportedly experience hunger, and 66 percent of these children are in the former homeland areas (National Agricultural Marketing Council, 2002) (table 2.1).

**Table 2.1: Hunger risk classification in children aged 1-9 by area of residence, 1999.**

Area of residence	Food Secure	At risk of hunger	Experience hunger
Formal urban	41	23	37
Informal urban	21	18	61
Commercial farms	23	29	48
Former homeland areas	11	23	66
South Africa	25	23	52

Source: National Agricultural Marketing Council, 2002, citing National Food Consumption Survey.

#### **2.4 How households cope with food insecurity**

When food insecure households have lost access to regular food because of inadequate incomes, or because drought or conflicts have affected income sources, various strategies are employed to cope with shocks (Saad, 1999). Tulane (1992) suggests that there are four progressive stages that households face when experiencing food shortages. In the early stages of food insecurity, households do not immediately sell excess produce and livestock that they have put aside for consumption or selling during lean seasons (Tulane, 1992). Rather than eating or selling preserved stock, households often first adjust consumption patterns by changing diets to reduce portion sizes and the number of meals eaten in a day, gather wild foods, seek wage labour and borrow money from relatives (Tulane, 1992, p2). Chung, Haddad, Ramakrishna and Riely (1997) have reported that when poor households

were not able to purchase vegetables due to lack of wages, poor households often cooked wild vegetables because they often do not require spices or oil for cooking. In some instances, households borrow food hoping that the crisis will pass (Brink, 2001).

If the food shortage persists, food consumption becomes the top priority over asset preservation in food insecure households. To cope with food shortages, poor households may liquidate assets at lower prices (Fraser, Mondé and van Averbeké, 2003). Non-productive assets (such as jewellery) and small animals (like goats, chicken and sheep) serve as crisis insurance and are among the first to be liquidated during food crises. Productive assets such as land, farming equipment, and large animals like oxen and cattle are preserved. In the study by Chung *et al* (1997) in south India, households sold dowries, goats and sheep to repay loans made to purchase food. Households may apply other coping strategies such as temporary migration for work, skipping meals for entire days and purchasing food on credit (Tulane, 1992). Maxwell (1995) purports that purchasing food on credit is not a viable option for those faced with constant food insecurity as they may not be able to repay loans once asset depletion occurs.

The third stage of household food insecurity is marked by the sale of productive assets such as seed, livestock and land to buy food (Frankenberger, 1992). In this respect, saving lives is deemed more important than preserving productive assets regardless of their importance in the overall household economy (Rugalema, 2000). Sales of productive assets have severe implications for the future productive potential of households and long term food security (Tulane, 1992; Frankenberger, 1992). In the fourth stage of food insecurity, households are left completely destitute. All or half the household members may



permanently migrate in order to find suitable land, employment or food aid assistance (Tulane, 1992, p2). Failure to cope with food shortage, may result in household dissolution. Some household members may leave the household and join other households (Rugalema, 2000).

On the other hand, Tulane (1992) has noted that households may not always follow the sequence of coping strategies as discussed above. Tulane (1992) has cited that some households may suddenly be affected by severe food insecurity (in complex emergencies, such as sudden crop failure, or floods) to the extent that they skip the first and second stages of food insecurity and move directly to stage three or four. Destitute households may attempt to escape destitution by adopting various response strategies but may not be able to avoid a long-term downward trend in food insecurity and may never fully recover from the shock (Southern African Development Community, 2003 citing: Rugalema, 1999 and Tumushabe, 2003). Quite often members of destitute households are too weak to work and simply need food aid to survive (Tulane, 1992, p2).

## **2.5 Food security interventions**

There are several types of food security interventions. Common food security interventions focus on increased production, economic aid and food aid. Food aid refers to food relief or food assistance programs that provide free (or highly subsidised) meals and/or food parcels to food insecure households (New South Wales Department of Health, 2003, p37). Economic interventions give poor households money in cash to live, mainly to buy food (Quisumbing, 2003). Production interventions such as gardening and livestock production need people to be involved in food and income generation activities (Marsh, 1998).

All interventions have advantages and disadvantages. The key disadvantage of food aid interventions is that households rely on it on a continuing basis because they have no means of providing their own food (New South Wales Department of Health, 2003). Quisumbing (2003) has asserted that food aid interventions are useful in the short-term to mitigate shocks such as livestock death and/or crop failure, allowing poor households to better maintain consumption without having to sell assets.

Cash transfers are intended to enable households to buy food (Bonnard, 2001). However, cash provision may act as a disincentive for involvement in economic or agricultural activities (Borrel, 2001). Activities such as agricultural production and trade are likely to face serious threats because people who have money do not volunteer for them (Borrel, 2001). Like food aid interventions, cash transfers could cause people to rely on aid. People's reliance on food aid or cash transfers/ grants would not normally be considered as having achieved food security (New South Wales Department of Health, 2003). To achieve food security, households must have access to enough resources so that they do not need to rely on food aid or cash transfers (New South Wales Department of Health, 2003).

The main disadvantage of production interventions is that they are susceptible to natural disasters, like drought, pests and diseases (FAO, 1995a). However, the advantages of production interventions by far outweigh their disadvantages. Production interventions are development-oriented and aim at permanently lifting people out of poverty by providing physical, human (productive capacity), and social capital to sustain households after the assistance ceases (Haddad and Zeller, 1996). Examples of production interventions that

invest in human capital are home gardening and small animal husbandry that enhance the production skills of rural households (Marsh, 1998) and provide nutrition education (Berti, Krasevec and FitzGerald, 2003). Sustainable food security interventions support what poor people already have or do to improve their capacity to acquire food (Fraser *et al*, 2003).

In addition, Ruel and Levin (2000) have postulated that vitamin A and iron deficiencies are global public health concerns. Ruel and Levin (2000) have called for interventions that will improve vitamin A and iron in the diets of food insecure households. Small animal husbandry and fish ponds, when integrated with home gardening, can supplement staple plant-based diets with cheap sources of animal products for the control of iron deficiencies (Ruel and Levin, 2000). Production interventions, such as home gardening and small animal husbandry, are recommended by the Special Programme for Food Security as effective strategies for improving food security of poor households (FAO, 1998). FAO (1998) has asserted that production interventions can be produced using cheap local resources and have nutrition and income benefits. Ruel and Levin (2000) have pointed out that nutritional status of households improves only when small animals are combined with food gardens. This means that if food security interventions are to improve nutritional status of households, they should include both small animals and gardening in the strategy. The benefits of combining small animals and gardening in food security interventions with specific emphasis on village poultry and home gardening are discussed in the next sections.

## **2.6 Village poultry as an option for household food security**

FAO (2003) has claimed that village poultry has made a significant contribution to the livelihoods of vulnerable rural households in developing countries. With minimal technical

and institutional support, village chickens could curtail the vicious cycle of unemployment and poor human nutrition (Swatson, Nsahlai and Byebwa, 2001). Rural households typically keep village chickens for meat and eggs (Alders, Fringe and Mata, 1997). Chicken meat and eggs are reported to complement the staple diets of rural Africans due to their higher nutrient concentration (FAO, 1998). Some households sell eggs produced by village chickens and use the income accrued from the sale as protection against unexpected household cash needs, such as medical expenses (Moreki, Petheram and Tyler, 1997). In Sudan, women have used income from selling eggs to buy household consumable goods (FAO, 1998).

Village chickens play a key role in the context of many social (special banquets for family guests, gifts, and cocks as alarm clocks) and religious ceremonies (as sacrifices) (Gueye and Fallou, 2000). The birds also consume unwanted pests and village waste and scavenge grain spilt during harvest (Moreki *et al*, 1997). Similar reasons for keeping village chickens have been cited by Swatson *et al* (2001) in a study assessing village poultry production in KwaZulu-Natal. Ninety percent of respondents in the KwaZulu-Natal study cited food security as the reason that they kept village chickens, while 57 percent cited fulfilment of customary duties as the reason for keeping these birds (Swatson *et al*, 2001). In addition, processing of chicken products (egg dishes and meat) makes efficient use of fuel because these meals cook quicker than pulses and red meat (Alders *et al*, 1997). As village chickens can be reared at home and do not need much care and attention, they can easily be reared by women. As a result village chickens are a source of women's empowerment because they grant opportunities for woman to contribute to households food security in providing food and income made from the sales of eggs and chickens (Gueye and Fallou, 2000).

### 2.6.1 Village poultry as a source of protein

Policy makers, researchers and development workers have realised the positive role village chickens play in providing protein for rural households (Ngongi, 1996). Consumption of poultry products in developing countries has increased by 5.8 percent a year (FAO, 2003). Poultry meat and eggs, which members of household can easily harvest (Permin and Hansen, 1998), are a source of protein for immediate home consumption (FAO, 1998).

It has been reported that 20 percent of animal protein, consumed in most developing countries, originates from poultry products (FAO, 1998; Branckaert and Gueye, 1999). Silverside and Jones (1992) have reported that chicken flesh contains 19 percent protein. Eggs contain 12.8 percent protein, and fall in the same protein food group as meat and fish (Silverside and Jones, 1992). As a result of higher nutrient concentrations, chicken meat and eggs are used to complement staple diets in rural Africa (FAO, 1998). Table 2.2 shows the nutrients provided by 100g of poultry meat, eggs and other selected staple foods in Africa. An increase in rural poultry production could improve rural household dietary intakes and increase household food security (FAO, 1998).

**Table 2.2: Nutrients provided by 100g (edible portion) of poultry meat, eggs and other selected staple foods in Africa (by FAO, 1998, citing FAO, 1997c)**

Food item	Energy (kcal)	Protein (g)	Calcium (mg)	Iron (mg)	Vitamin A (ug)
Egg (raw)	158	12.1	56	2.1	156
Poultry (raw)	139	19	15	1.5	0
Maize flour	353	9.3	10	2.5	0
Rice, Polished	361	6.5	4	0.5	0
Cassava flour	344	1.6	66	3.6	0
Sorghum	345	10.7	26	4.5	0
Plantain	135	1.2	8	1.3	390

### **2.6.2 Statistics of poultry production**

The last decade has witnessed massive poultry population growth in developing rather than in developed countries (FAO, 1998). In developing countries, FAO has supported poultry production in integrated agricultural projects totalling more than US\$2.5 million in 2003 (FAO, 2003). In 1995, the total poultry population of Africa was estimated at 16 million ducks, seven million turkeys and 1,068 million chickens, with domestic chicken holdings (*Gallus domesticus*) accounting for more than 90 percent of the world's total poultry flock (Gueye and Fallou, 2000). FAO (1998), has reported that more than 60 percent of world's poultry population is located in African countries. In Tanzania, a survey of 600 households in 20 villages showed that chickens were the only form of livestock found in most households (FAO, 1998). Burkina Faso's 25 million strong rural poultry produced 15000 tonnes of meat, of which 5000 tones was exported in 1990, mainly to Cote d'Ivoire, generating US\$ 19.5 million (FAO, 1998).

In Botswana, village chickens cost US\$0.41 more than the commercial broiler chickens (Swatson *et al*, 2001, citing Moreki *et al*, 1997). Village chickens have the potential to improve household access to food by not only increasing food availability and improving consumption of protein, but also increasing food purchasing power. In Bangladesh, the family poultry sector represents more than 80 percent of the total poultry production and 90 percent of the million rural households keep poultry (FAO, 1998). This shows that households in developing countries significantly benefit from village poultry production.

### **2.6.3 Rearing, breeding and productivity of village chickens**

Most households in developing countries practice extension poultry farming in which they

allow indigenous chickens to roam around the homestead scavenging for food (Branckaert and Gueye, 1999). The chickens stray from the homestead during the day and return in the evening to find comfortable shelter. As a result, of the cost effectiveness of rearing village chickens, the chickens can be kept even by the poorest social strata of the population (Gueye and Fallou, 2000).

Moreki *et al* (1997) claim that climatic conditions and husbandry practices are important factors that influence the breeding and productivity of village chickens. Cold weather is more suitable for breeding village chickens because predators hibernate in cold weather (Branckaert and Gueye, 1999). On the contrary, cold temperatures may be unfavourable for chicks, causing them to die on hatching (Moreki *et al*, 1997). To prevent chicks from dying from exposure to the cold after hatching, the chicken owner must confine them with the hen for at least two to three months (Moreki *et al*, 1997). Again, it has been reported that high temperatures and rainfall during breeding periods could result in high egg decay rates and resultantly low hatchability rates (Moreki *et al*, 1997).

Poultry productivity decreases under poor husbandry (unhygienic) and feeding conditions (Branckaert and Gueye, 1999). For example, a scavenging hen typically lays 30 to 50 eggs a year while under improved husbandry conditions and feeding, the same hen can lay up to 90 eggs a year (Branckaert and Gueye, 1999). In other words, diseases that could occur from poor husbandry and inadequate feeding, may lead to fewer eggs and a subsequent decrease in household food security. Therefore, if the owner of chickens has to increase their number, he/she should have a sound knowledge of the environment suitable for breeding village chickens and put in effort to provide such an environment for the chickens.

#### **2.6.4 Feeding village chickens**

Apart from feed that the village chicken scavenge, balanced supplements are required so that chickens can lay more eggs (FAO, 1998). Village chicken rearers should produce balanced diets for their chickens by mixing together feed products such as aquatic plants, shrub leaves, insects, fruits, and small animals that are rich in minerals, vitamins and proteins (Branckaert and Gueye, 1999). However, chicken rearers need to be trained so that they can easily identify locally available feed resources, and know how to prepare balanced feed for their chickens (Gueye and Fallou, 2000). Chicken rearers should also know when, during the year, these resources are available so that they may gather them when they are still found in abundance (Branckaert and Gueye, 1999). For example, Gambian farmers have been successfully trained on how to make supplementary feed by mixing oyster shells, fish bones and termites that are readily available (FAO, 1998).

#### **2.6.5 Mortality of village chickens**

Chick mortality accounts for high losses in most village chicken production systems (FAO, 1998). Chicks have a mortality rate of 30 compared to 7 percent of adult chicken (Rangnekar and Rangnekar, 1999). At twelve weeks of age chickens have 50 percent lower mortality rates than at eight weeks (Gueye, 1998). Poor village chicken management increases chicken mortality rates (Swatson *et al*, 2001).

FAO (1998), has asserted that poorly managed village chickens are susceptible to disease and attacks by external parasites. The study by Swatson *et al* (2001) revealed that Newcastle Disease, infectious Bronchitis, diarrhea, infectious Coryza, and Escherichia Coli are prevalent diseases in village chickens in KwaZulu-Natal. Newcastle Disease was the



most prevalent cause of fatalities among the KwaZulu-Natal sample. The Special Programme for Food Security (SPFS) has given guidelines for effective management of village poultry as part of its food security packages (FAO, 1998). According to the SPFS's guideline for family poultry management, the logical starting point for improving village chicken production, is the control of Newcastle Disease through vaccination of chicks (Alders *et al*, 1997) and providing chicks with improved supplementary feed and proper housing (FAO, 1998). It is important that village chicken rearers should know the vaccines that are suitable for treating different village chicken diseases and be able to use them and not rely on animal health officers for treatment or prevention of chicken diseases.

## **2.7 Role of home gardens in household food security**

Home gardens can contribute a major part to food and nutrition security by ensuring adequate access to supplies of vegetables at all times (Marsh, 1998). FAO (2001b) have noted that produce from a home garden can significantly contribute to households' food security through observation of a home garden supported by the Helen Keller Foundation, that increased overall vegetable consumption by 30 percent. A home garden can supply a household with 80 percent of its vegetable requirement and generate some income from the sale of surplus vegetables to buy food that the household could otherwise not produce (FAO, 1997; Schmidt and Vorster, 1995). Schmidt and Vorster (1995) have indicated that production of vegetables at household level improves the consumption of micro-nutrient rich foods. Vitamin A and iron deficiencies are among the nutritional deficiencies of greatest public health significance in the world today (Ruel and Levin, 2000). Successful home garden projects combine strategies that address both increased production and consumption of vitamin A (FAO and International Life Sciences Institute, 1997) and iron-

rich (National Department of Agriculture, 1993) vegetables to address the needs of special groups such as young children, women of child bearing age, and pregnant and breastfeeding women.

When women and children regularly consume vegetables that contain enough iron, their chance of suffering from anaemia is reduced (National Department of Agriculture, 1993). Thus, supplementing staple foods with vegetables will supply nutrients (vitamins A and C, iron and other minerals) needed by the body for building strong bones, tissues and immune systems (FAO, 1997). An evaluation of the potential of a gardening project in improving vitamin A status of individuals undertaken in Kwazulu-Natal by Faber, Phunghula, Venter, Kvalsvig and Benadé (2002) showed a substantial increase in the number of children consuming vitamin A rich vitamins and precursors after twenty months of project implementation. Data from an FAO project in Niger promoting the production and consumption of vitamin A-rich foods between women's groups and their families showed that the number of healthy children increased in villages involved in vegetable production compared to those that did not produce vegetables (FAO, 1997).

Root vegetables such as beets and carrots are widely grown in home gardens of South Africa throughout the year (Nell, Wessels, Mokoka and Machedi, 2000). Beetroots are rich in carbohydrates and fibre (van Antwerpen, 1993) but have lower quantities of vitamins and minerals than the leaves (Siemonsma and Piluek, 1993). Yet, beet leaves are often eaten in smaller quantities than the roots, especially in African countries (Ruel and Levin, 2000; World Bank, 1998). Carrots are good sources of beta-carotene, vitamin C, calcium and iron (FAO, 1995b). Onions are a good source of calcium, phosphorus and potassium and their

consumption strengthens the immune system and lowers cholesterol levels (Uys, 1997). By planting vegetables all year round, households can use home garden vegetables to replenish food supplies during lean seasons when staple food stocks are depleted (FAO, 2001b). In addition, households can preserve and store excess seasonal produce from a home garden for use during the lean season using preservation techniques such as drying and canning (FAO, 1997). Households can also sell some produce from home gardens and use the money accrued from the sales to buy foods such as oil, meat and additional staple foods that households are unable to produce and that impact positively on household nutritional status (FAO, 2001b).

## **2.8 Methods for measuring food security**

There are various methodologies used for measuring household food security. The choice of methodology is determined by purpose of study, data available, costs of collecting data, and the analyst's preference (Riely, 2000). Different methodologies use different food security measurements. Food security measurements are a collection of direct and indirect indicators reflecting food supply, food access, and outcome indicators (proxies of adequate food consumption) (Frankenberger, 1992). Agricultural production, regional conflict, pest management practices, market access and institutional support structures are examples of food supply indicators (Frankenberger, 1992, p 84-89). Examples of food access indicators are food entitlement and socio-economic indicators that indicate the ability of households to cope with various stresses resulting from economic and social changes (Frankenberger, 1992, p 89-95).

Outcome indicators go beyond measuring food consumption only. For example,

malnutrition indicators also capture the influence of environmental aspects like bio-utilisation factors, health and sanitation on nutrition, growth and development (Frankenberger, 1992, p96). Outcome indicators are divided into direct and indirect indicators (Frankenberger, 1992, p96). Direct indicators measure the experience of food insecurity itself (for examples: food consumption surveys, households perceptions of food insecurity or hunger and food frequency measurements). Woolfe and Frongillo (2000) have asserted that direct indicators can best be measured by observing households overtime and by interviewing household members about their food consumption patterns (ie. the type of food consumed, the frequency of consumption, and perceptions of hunger). Indirect indicators of food security are used where access to such direct information is either unavailable or expensive to collect. Examples of indirect indicators include dietary diversity, storage estimates at critical times of the year, subsistence potential (for largely agrarian households) and nutritional assessments (for example anthropometric indicators).

To differentiate food secure from food insecure households and to monitor the impact of various interventions, scales and indexes have and are being developed. However, there is a lack of consensus about the reliability or accuracy of scales and indexes used to measure household food security. For example, Riely (2000) reported that even given the same set of indicators, different methods of constructing indexes can lead to different conclusions (even within the same approach to measurement). The lack of consensus on reliable household food security measures, results in various approaches being used and developed. These include household vulnerability measures, dietary diversity measures, experiential tools and coping strategy assessment tools. These measures are discussed below.

### **2.8.1 Vulnerability approaches**

Household vulnerability approaches are used by various aid agencies such as the Food and Early Warning System (FEWS), Food and Income Vulnerability Information Mapping Systems (FIVIMS), and the World Food Programme (WFP) to target food aid, identify the need for emergency interventions and monitoring interventions (Riely, 2000). Another example of vulnerability assessments is the Save the Children's Fund's Household Economy Approach (HEA). The HEA approach uses rapid assessment methods for assessment of food aid over a longer period than FEWS, FIVIMS and WFP assessments (Riely, 2000). The HEA approach gives an idea of how households in a particular area access food in normal years (Boudreau, 1998) and is used to inform national monitoring system development.

### **2.8.2 Assessments of dietary diversity**

Assessments of dietary diversity are used by the Food and Nutrition Technical Assistance (FANTA) Project (FANTA, 2002; Hoddinott and Yohannes, 2002). Some studies assess dietary diversity by counting the number of food groups consumed by household members while others count each food item consumed over a period (Hoddinott and Yohannes, 2002). The ten-country (Bangladesh, Egypt, Ghana, India, Kenya, Malawi, Mali, Mexico, Mozambique, and the Philippines) study by Hoddinott and Yohannes (2002) examined whether dietary diversity was a good measure of household access and found that increased diversity of individual food items and food groups was strongly associated with increased household per capita energy availability for rural and urban households. Hoddinott and Yohannes (2002) concluded that dietary diversity showed promise as a means of measuring household food access, and monitoring changes and interventions impacts. Labadarios

(undated) used a twenty-four hour recall questionnaire to collect data on the dietary intake of the children aged 1 - 9 years and a Food Frequency Questionnaire to provide information on the eating patterns and intakes of children over the previous five and thirty days (Labadarios, undated). There was significant positive correlation between average nutrient intakes obtained through the twenty four hour recall and the food frequency questionnaires (Labadarios, undated).

### **2.8.3 Experiential-based measures of food security**

Experiential-based measures of food security measure the experience of hunger by sample households over time using qualitative surveys (Rose and Charlton, 2002). An example of experiential measures of food security is the United States Federal Food Security Measure that measures anxiety, perceptions and social acceptability of food insecurity (Woolfe and Frongillo, 2000). The advantages of experiential tools are that they are simple, require a short time to administer and allow rapid and repeat interviews over time. The tools capture both the severity and levels of food insecurity (Woolfe and Frongillo, 2000). The key limitation of the tool is in setting cut-off for classification of households, such as in the Federal Food Security Measure where households are classified into four groups according to severity of experience of hunger (Woolfe and Frongillo, 2000). The Federal Food Security Measure has been integrated into the United States Current Population Survey to develop a continually monitored food security measure (Woolfe and Frongillo, 2000). Assessments of experiential-based measures of food security are always subject to intentional misreporting due to self-interest. However, Nanama and Frongillo (2003) found that an experiential-based tool was valid for assessing household food security in a study in Northern Burkina Faso when compared to wealth, dietary and anthropometric measures

for 126 households.

#### **2.8.4 The Coping Strategy Index tool as a measure of food insecurity**

The most recently developed measurement tool for food security is the Coping Strategy Index (CSI) developed by CARE International and the World Food Programme (Maxwell, Watkins, Wheeler and Collins, 2003). The CSI was developed in Uganda and Ghana but has been used for early warning and food security assessments in Burundi, Eritrea, Ethiopia, Kenya, Malawi, Zambia and Zimbabwe (Maxwell *et al*, 2003). The concept is based on assessment of responses to the question of what households do when they do not have enough food and/or money to buy food. Households are asked how often they employed a list of strategies identified by community level focus groups. Information on the frequency and severity of coping strategies applied in a particular area was weighted according to the severity level of identified coping strategies as defined by community level focus groups and combined into a single score (Coping Strategy Index) per household.

The advantages of the CSI over other tools used for measuring household food security are that, unlike other tools that simply measure gross consumption, it sheds some light on what people do when they are faced with food insufficiency (Maxwell, 1995). “CSI is a good proxy for food intake (caloric adequacy) and food budget shares (the proportion of income that households devote to food purchase), food frequency, income status and the presence or absence of a malnourished child in the household” (Maxwell *et al*, 2003, p7).

In addition, Maxwell (1995) used the CSI to capture the short-term food sufficiency element of food security at the household level in a survey that was intended to quantify the

determinants and impacts of long term, adaptive household strategy of semi-subsistence farming in a major African urban centre. The findings of the study revealed that there was a significant relationship between the cumulative food security index, income levels and seasonal food variability in lower income groups (Maxwell, 1995, p8). CSI is also quicker (requiring only three minutes) to apply and it is simpler and cheaper to collect information on coping strategies than on household food consumption levels (Maxwell *et al*, 2003). The other advantages of the CSI tool are that it can be used to assess whether food aid has been targeted to the most food insecure households (Maxwell *et al*, 2003).

On the other hand, the disadvantage of the CSI, like other recall methods, is that if respondents know or think that the frequency of application of coping strategies is the criterion for receiving food assistance, they may exaggerate their food insecurity problems. One drawback of the CSI is the difficulty involved in comparing the CSI data between households in different locations as: first, households in different locations apply different coping strategies and second, the application of coping strategies is subject to multiple interpretations (Hoddinott, 1999). For example, what is meant by “eating smaller portions” in one area, might mean something different in another area. However, this problem can be overcome by identifying coping strategies applicable in each location (Maxwell *et al*, 2003) and recognising that the measure is a comparative tool rather than an absolute index.

## **2.9 Synopsis**

This chapter has discussed the concept of food security and how the concept has evolved from the overall regional, national, and global food supply, to focussing attention on local and household level food availability, access and utilisation. The review has shown how



food security and poverty in developing countries are interrelated. The review showed how high unemployment rates in rural South Africa have increased the vulnerability of households to food insecurity and malnutrition. The review has indicated that increased income in poor households, if used to buy food and if food prices are controlled, could reduce household food insecurity. The review has also discussed how food insecure households cope with food shortages.

Different types of food security interventions were discussed. It was highlighted that food security intervention strategies such as food aid are not sustainable as some households may become dependent on food aid. Such interventions do not empower households with the ability to provide for their own food needs. On the other hand, food production interventions were indicated as sustainable since they empower households with skills and productive resources to provide food. The review discussed in detail two food production interventions (village poultry and home gardening). The review discussed approaches used for measuring household food security. It showed that various food security measurements exist and the choice of the measurement is determined by data availability, preference of the analyst and cost of data collection. Furthermore, the review indicated that there is a lack of consensus on reliability and accuracy of different food security methodologies. It indicated that lack of consensus over food security measures has resulted in development of multiple and new food security measurements that are being tested for accuracy and validity. Household vulnerability measures, dietary diversity measures, experiential tools and coping strategy assessment tools were discussed. The next chapter will describe the Free State Department of Agriculture's Food Security Programme.

**CHAPTER 3**  
**THE FREE STATE DEPARTMENT OF AGRICULTURE'S**  
**FOOD SECURITY PROGRAMME**

The Department of Agriculture in the Free State established the Food Security Programme in 2002 to help food insecure households access food. Food Security Officers are responsible for identifying target beneficiaries for the programme. Beneficiaries were meant to be household members living in food insecure households from previously disadvantaged communities, with limited or no household income and should have been unemployed, disabled, headed by children or women, and/or people suffering from chronic diseases such as Tuberculosis and/or HIV/AIDS. Beneficiaries were proposed as individuals committed to growing vegetables on at least 50 square metres at their homes (in a continuous cropping system) for a minimum period of five years. However, individuals who did not have such an area would be allowed to work on communal land. Beneficiaries should also be committed to keeping village chickens to supply eggs and meat.

To allow quick programme delivery and to organise training, individuals are required to group themselves into associations of ten members. Individuals who lived in the same area and shared common interests, formed associations. Belonging to a group enables individuals to share aspirations and encourage one another. Through the facilitation of the Food Security Officers, the associations drew up working constitutions and elected office bearers. The individual members paid R5.00 membership fee. The association used the R5.00 to open a group bank account. Once the association had satisfied the above

mentioned requirements, they completed an application form for assistance through the food security programme. The Food Security Officer checked that the application form was correctly completed and sent the application form to the Programme Manager for recommendation. After the Head of the Department of Agriculture approved the application, the Programme Manager instructed the Food Security Officer to obtain

**Table 3.1 : Free State Department of Agriculture's food security package**

ITEM	QUANTITY	
Village chickens	20	
Chicken feed	20kg	
Poultry cage	1 (20 chicken capacity)	
Hose pipe	1x30m	
Spade	1	
Garden fork	1	
Garden rake	1	
Watering can	1	
Wheel burrow	1	
Fertiliser	5kg	
<b>Seeds</b>		
Cabbage	summer = 75g x 2	winter = 75g x 2
Spinach	summer = 75g x 2	winter = 75g x 2
Onion	summer = 75g x 2	winter = 75g x 2
Beetroot	summer = 75g x 2	winter = 75g x 2
Carrots	summer = 75g x 2	winter = 75g x 2
<b>Garden fencing material</b>		
Gate	1	
Y- standard poles	9	
Tar treated poles	5	
Diamond mesh fence	30 running metres	

quotations for the purchase of the individual food security package elements (table 3.1).

Each package had an average value of R4 500 per household. The package included garden fencing material, gardening tools, winter and summer seeds, fertilizer, water hoses, 20 (20 month old) village chickens, feed for the village chickens, and a ready made portable poultry cage (table 3.1). Once the packages were delivered to individual members of the association, the Food Security Officer organised training on vegetable production and village poultry rearing for them (the duration of training offered was not specified). The training was offered by the Non-Formal Training Unit of the Department of Agriculture. The Ward Extension Officer regularly visited the associations to provide follow-up care, and to inform the Food Security Officer of the progress and problems. The programme organises the Food Security Household of the Year competition for households that received packages to promote the programme, and to create awareness about the need for improved household food security.

The methodology for the investigation of the impact of these packages on Qwaqwa households is described in the following chapter.

## CHAPTER 4

### METHODOLOGY

#### 4.1 Survey design

A survey of 60 households was conducted between April and June 2004 to evaluate the impact of food security packages on sample households in Qwaqwa. The survey was conducted twelve months after the households had received packages. To collect information on the food security condition of households, a face to face survey technique was chosen. A questionnaire was developed to collect information. Rubin and Babbie (1997) have asserted that face to face interviews have high response rates, often around 90 percent, because people are reluctant to refuse a face to face request for cooperation. In addition, face to face interviews were chosen to overcome problems respondents could experience when answering the questionnaire due to factors relating to literacy levels.

Both qualitative and quantitative data were collected. Frankenberger (1992, p111-113) has reported that both methods (qualitative and quantitative) have advantages and disadvantages. The advantage of quantitative methods is that they are helpful in determining the breadth to which observed behavioural practices or problems are distributed within a population (Frankenberger, 1992, p113). The disadvantages of quantitative methods are usually associated with high costs of administering surveys and lack of consideration of local context (Frankenberger, 1992, p112). The advantage of qualitative methods is that they help the researcher gain more information about the local context in which households operate (Chung, Haddad, Ramakrishna and Riely, 1997). On the other hand, the disadvantage of qualitative methods is that they often do not give

information that is generalisable to a larger population (Frankenberger, 1992, p113). To benefit from the advantages and to overcome the disadvantages of quantitative and qualitative methods, this study has used both these methods to capture information on food insecurity problems in Qwaqwa households.

The questionnaire was written in English but the interviewer asked the questions in Sesotho (the language the respondents understood) to obtain accurate information (Huysamen, 1994). In addition, the researcher personally conducted the survey and gave respondents similar explanations to questions to avoid burdening respondents with the task of having to interpret questions themselves. As only the researcher conducted the survey, greater reliability of data was ensured. The maximum time taken to collect all the necessary data per respondent was thirty minutes.

#### **4.2 Population and sample selection**

The study respondents were drawn from households on recipient and waiting lists of the programme. To capture the impact of the packages on households, the study has compared characteristics and coping strategies employed by recipient and non-recipient households. Riely *et al* (1999) has asserted that comparisons of food security status of intervention recipient and non-recipient households that exhibit identical characteristics is necessary to capture the actual impact of the food security intervention as the two groups live in the same environment. The use of the comparison (control group) disentangles the actual impact of the intervention from the influences of environment, conditions and opportunities and reveals if the observed effects could be attributed to the intervention's impact or not (Carletto and Morris, 1999). In organising the respondents for the survey, the researcher

requested a list of all households who were recipients of food security packages and those who were on the waiting list (i.e. had applied for, but not yet received packages). All households who were on the recipient list of food security packages at Qwaqwa (30 households) were studied and compared with 30 households selected (using simple random sampling) from the waiting list. Simple random sampling gave each household on the waiting list an equal chance of being selected (Frankenberger, 1992). To be able to use simple random sampling, the researcher sequentially numbered all households on the waiting list (290 households) and selected 30 households using a computer function.

#### **4.3 Survey materials and approaches**

As discussed above, a questionnaire was used as data collection instrument (refer to Appendix A). The questionnaire included questions with closed-ended, one word responses and partially closed-ended questions with the option for respondents to add other responses. Part one of the questionnaire was designed to provide information on household composition, sources of income and asset ownership. Part two was designed to collect programme related information, that included the frequency of consumption by a household of foods that were included in the packages (namely chicken, beetroot, cabbage, spinach, carrots, onion, and eggs as by-products of chickens) and other meat types such as beef, mutton, pork, fish, and processed meats. Household consumption of these meats (beef, mutton, pork, fish and processed meats) would indicate whether household income had increased as a result of the packages or not, following Hendriks (2003) findings that as household incomes increase, particularly through smaller consistent incomes from farming, households are likely to buy meat and meat products that improve nutritional status and diet quality.

Part three of the questionnaire collected information on the frequency of application of consumption coping strategies using Maxwell *et al's* (2003) Coping Strategy Index (CSI). The CSI is a tool used to analyse how often households apply consumption coping strategies over a period of 30 days (Maxwell *et al*, 2003).

The reason why this study chose the CSI tool over other measures of food insecurity was to get the real picture from the mouths of the people who actually experienced food shortages on how they perceived and coped with food shortages in their households; and to determine the change in food insecurity levels that had occurred in households as a result of the food security packages. The CSI is able to determine the impact of the intervention as it gives an accurate picture of the household food insecurity or security situation and reflects the extent to which households are able to access food (Maxwell *et al*, 2003). Through the CSI score, the CSI tool provides target level of household food security which an intervention could aim to restore (Maxwell *et al*, 2003). By monitoring the household CSI score overtime, one could see the trend of household food security status throughout the intervention (Maxwell *et al*, 2003). The household food security status trends would give an idea of whether the desired intervention impact has been achieved or not.

In preparation for developing questions to collect information on the application of consumption coping strategies by the sample households, the researcher wrote an invitation letter to representatives of the community (Community Based Organisations such as Home Based Care Organisations, Non-Governmental Organisations such as Save the Children's Fund, and community workers from the Departments of Agriculture, Social Welfare, Health, and Education), inviting representatives to attend the workshop at which the



consumption coping strategies applied by Qwaqwa households were to be discussed. Each community worker was asked to bring along two community members responsible for preparing and serving household members with food. As anticipated, most community members were women as in most households women were the ones responsible for preparing and serving food. The total workshop attendance was 48 (community workers and members combined) (Appendix B). The workshop lasted six hours.

Four people facilitated the workshop. The researcher facilitated discussions. The three facilitators distributed workshop materials (pens and papers), recorded discussions, and facilitated group discussions. At the start of the workshop the researcher presented the purpose of the workshop and introduced attendees to the idea of food security, food security measurements, and the reasons for assessing the impact of food security interventions. After the introductory presentation, the researcher asked participants to write down the consumption coping strategies applied by Qwaqwa households faced with not having enough food. The respondents were handed pieces of paper and pens. Participants recorded one coping strategy per piece of paper to ease the task of sorting similar strategies. Community workers wrote down the coping strategies they observed in the communities they served while community members wrote the actual coping strategies they applied. The coping strategies were recorded and discussed in Sesotho as all respondents could read and write Sesotho.

When the participants had finished recording the coping strategies used, the facilitators sorted the papers into similar coping strategies. After sorting similar coping strategies, the scribe typed them on the computer. The computerised list of coping strategies was

projected via the video projector for everyone to see. The facilitator read the list out and asked the participants to discuss how they understood each strategy. During discussion, the participants added and removed some coping strategies from the list. The coping strategies that were added were those that all participants reached consensus on that they were applicable to food insecure households in Qwaqwa. Coping strategies that participants could not reach consensus over were removed from the list. During the discussion, the participants differentiated normal behaviours from acts prompted by food insecurity. For example, the participants agreed that eating wild food may not always be a coping strategy, but it may sometimes be the normal habit or preference for some households or individuals. However, it was agreed that reliance on wild foods was a severe food insecurity coping strategy. Therefore, the researcher took note of such highlights, and made it clear to respondents that she was looking specifically for coping strategies applied due to food shortages. Following Maxwell *et al*'s (2003) technique, the list was trimmed and modified until only those coping strategies upon which all participants agreed to as fair reflections of coping strategies applied in Qwaqwa were left (Appendix A).

When the list of coping strategies had been developed, the researcher wrote down relative frequency categories adopted from Maxwell *et al* (2003, p11) (see the relative frequencies on the questionnaire in Appendix A). Relative frequencies gave a rough indication of the number of days in a week over the past 30 days in which a household had used a given strategy (Maxwell *et al*, 2003). Relative frequencies were used to overcome the respondents' difficulty of precisely recalling the actual number of times a household had used a strategy (Maxwell *et al*, 2003). After writing down the relative frequencies, the researcher asked participants to rank and group strategies into categories that are roughly

of the same level of severity (table 4.1). In preparation for grouping the strategies into categories of the same level of severity, the workshop facilitators grouped participants into six groups.

**Table 4.1: Coping strategies grouped and ranked according to severity levels**

Coping strategies grouped and ranked								
Strategies	Groups						Average score	Consensus ranking
	1	2	3	4	5	6		
1. Rely on less preferred food (pap and tea, jam, animal fat)	2	2	1	1	1	1	1.33	1
2. Drink alcohol to fill the stomach	3	3	2	4	4	4	3.33	3
3. Eat from dustbins	4	4	4	4	4	4	4	4
4. Borrow food, or rely on help from a friend or relative	1	2	2	3	3	4	2.5	3
5. Eat wild food	3	4	2	3	2	3	2.83	3
6. Send household members to beg	4	3	4	3	4	3	3.5	4
7. Purchase food on credit	2	1	1	1	4	2	1.83	2
8. Visit friends to eat with them	4	2	2	2	2	2	2.33	2
9. Send children to visit the relatives	2	2	3	3	4	2	2.67	3
10. Search for traditional ceremonies	3	4	2	4	4	3	3.33	3
11. Reduce the meal size send	1	2	1	3	2	3	2	2
12. Restrict consumption by adults in order for small children to eat	2	3	4	2	1	1	2.17	2
13. Skip entire meals eaten in a day	3	4	4	4	3	3	3	3

1=least severe; 2=moderately severe; 3=severe; 4=most severe

Each group was comprised of eight people of community members and representatives from different agencies (listed previously in section 4.3). Facilitators gave the list of consensus coping strategies to each group, and following Maxwell *et al's* (2003) technique, facilitators instructed each group to classify strategies into four different categories of 1 = least severe, 2 = moderately severe, 3 = severe, and 4 = most severe, according to the group's perceived severity level of each strategy (table 4.2). There was not complete

consensus on the groups' categorisation for most strategies. However, there was a perfect (100%) consensus that 'eating from dustbins' was the most severe strategy.

When the groups had finished ranking and grouping strategies into categories by severity, the facilitators tabulated the individual groups' results, and projected them for groups to see and compare their perceptions of severity of different strategies. The facilitators calculated the average score per strategy and the ranking per strategy was defined as the rounded-off average.

**Table 4.2: List of consensus coping strategies applied by Qwaqwa households classified according to severity levels.**

<b>Least severe strategy</b>
Rely on less preferred food (pap and tea, jam, animal fat)
<b>Moderately severe strategies</b>
Drink alcohol to fill the stomach
Purchase food on credit
Visit friends to eat with them
Reduce the meal size
Restrict consumption by adults in order for small children to eat
<b>Severe strategies</b>
Borrow food, or rely on help from a friend or relative
Eat wild food
Send children to visit the relatives
Search for traditional ceremonies
Skip entire meals eaten in a day
<b>Most severe strategies</b>
Eat from dustbins
Send household members to beg

The most severe coping strategies used in Qwaqwa were identified as eating from dust bins and sending household members out to beg. The least severe strategy was relying on less preferred foods such as eating pap with tea, jam, or animal fat. Other strategies were identified as a sign of severe and moderate food insecurity.

After grouping and ranking strategies into categories of the same severity, the researcher and workshop facilitators assigned scores for the relative frequencies (table 4.3). These

scores were assigned following the guidelines by Maxwell *et al* (2003). In assigning scores to relative frequencies, the researcher took the mid-point of the range of days in each category, and assigned that as the value for the category (table 4.3). This value, multiplied by severity level value of the strategy, was used to obtain the score of individual strategy.

**Table 4.3: Assigning scores for relative frequencies of application of coping strategies.**

The relative frequency categories		Mid - point value of the range of each category
Every day	seven days per week	7
Pretty often	3-6 days per week	4.5
Once in a while	1-2 days per week	1.5
Hardly at all	< a day per week	0.5

In preparation for collecting data from the two groups, the researcher compiled a list of all recipient and non-recipient groups per location (agricultural wards). The researcher telephoned the extension officers for each five agricultural wards included in the study and discussed with them the purpose of the study. The researcher and Extension Officers drew up a schedule for visiting the households. Although the researcher did not need assistance to collect data, it was necessary that she inform the ward Extension Officer for various reasons. First, the researcher did so to respect and recognise the Extension Officer as the ward manager. Second, it was necessary that the Extension Officer or one of his/her subordinates accompany the researcher to the sample households as the researcher did not know where to find the respondents. Third, the presence of the Extension Officer whom the respondents were familiar with, would ease tension and improve cooperation and participation of the respondents in the survey.

During home surveys, not all respondents were found at their homes. Some respondents were participating in other activities such as vegetable projects. However, as observation was another method of collecting data on physical food availability in the gardens of sample households, the researcher visited all households even in the absence of the respondents to see whether there were any vegetables in their gardens. As only the household member who was responsible for preparing and serving food to household members was to participate in the survey (Maxwell *et al*, 2003), the researcher had to find the respondent wherever he or she was, to collect data or return at a later date. Maxwell *et al's* (2003) has cited that the person responsible for preparing and serving food to household members is generally more knowledgeable of consumption coping strategies applied in a household than anyone else.

Before the survey could begin, the Extension Officer introduced the researcher to the respondents, informed the respondents of the purpose of the survey and requested their honest participation. To avoid creating expectations, the Extension Officer explained to the respondents that there would be no reward for participating in the survey, and that the researcher was not trying to identify households who qualify for further government assistance. The Extension Officer again emphasised to respondents that their answers were confidential. To ensure confidentiality of information, the researcher interviewed respondents individually, where no one could hear their responses.

The Community Planning and Development's Office of Programme Analysis and Evaluation (2002) has stated that people were more likely to give honest answers if they remain anonymous. The study used coded questionnaires (where respondents' names could

be detached from the questionnaires) to ensure respondents' anonymity. In recording the responses of respondents to questions asked, the researcher wrote and ticked the responses in the spaces provided on the questionnaire. Rubin and Babbie (1997) has asserted that recording responses is a central task of interviewers.

#### **4.4 Data analysis and presentation of results**

In preparation for analysing data on application of consumption coping strategies, the researcher multiplied the relative frequency of a strategy by its severity weight to obtain the score of the individual strategy. Thereafter, the researcher added together the scores of the individual strategies to obtain the coping strategy index score (CSI) of a household. The demographic and data showing frequency of consumption of different types of foods eaten by households, asset ownership and the individual strategies applied collected from the surveys were coded (Appendix C) and keyed into a Microsoft Excel spreadsheet (Appendix E) for analysis. SPSS (version 11) computer programme was used for statistical data analysis, to show means, modes and standard deviations, frequencies and Pearson correlations of different variables on the questionnaire. The characteristics of the study area are described in the following chapter.

## CHAPTER 5

### DESCRIPTION OF THE SAMPLE

#### 5.1 Background of the study area

Sample households were drawn from Qwaqwa, a former South African homeland established in 1972. Qwaqwa is situated in the mountain ranges of Maluti (the Drakensberg), in the Maluti-a-Phofung municipality of Free State province (Appendix D). Originally Qwaqwa was made up of one urbanised town of Phuthaditjhaba, and surrounding villages. Recently, more urban areas have been established in Qwaqwa (Riverside, Elite, Bluegumbosch and Clubview).

After the promulgation of the Bantu Authorities Act of 1951, allocation of land to people in their villages was entrusted to chiefs (Ntsebeza, 1999). The former homeland consisted of villages ran by chiefs prior to 1994. After the 1994 change of government, chiefs shared power with councillors as Qwaqwa reverted back to the Free State (van Niekerk, 2000). For easy management, the Department of Agriculture has divided the Qwaqwa villages into five wards managed by Extension Officers. The five wards were selected for study because Food Security Programme beneficiaries and potential beneficiaries lived in the villages in these five wards.

#### 5.2 Sample description

Household surveys were completed by 60 respondents of which 30 represented food package recipients (experimental group) and another 30 represented non-recipients on the waiting list for food security packages (control group). An independent samples t-test was



performed on the socio-economic variables of the recipient and non-recipient group households to verify that the two groups were indeed similar (Appendix F). The socio-economic variables tested were: households composition (average household size, numbers of males, females, adults, children (6 - 16 years), young children (<5 years) and migrated members of the household); characteristics of the heads of households (gender, education and occupation of the head of household); ownership of productive and non-productive assets (land, cow, sheep, chicken, goat, house, television, radio, and jewelry); and sources of household income (salary, pensions, child support grant, business, agriculture, and remittances). The t-tests results of individual socio-economic variables of the two groups are interpreted in the discussion that follows.

### 5.2.1 Household composition

The t-test results showed no significant differences between composition of recipient and non-recipient group households (table 5.1).

In both groups, households had an average of five members (for standard deviations, see Appendix F). Forty-one and 43.5 percent of recipient and non-recipient groups members

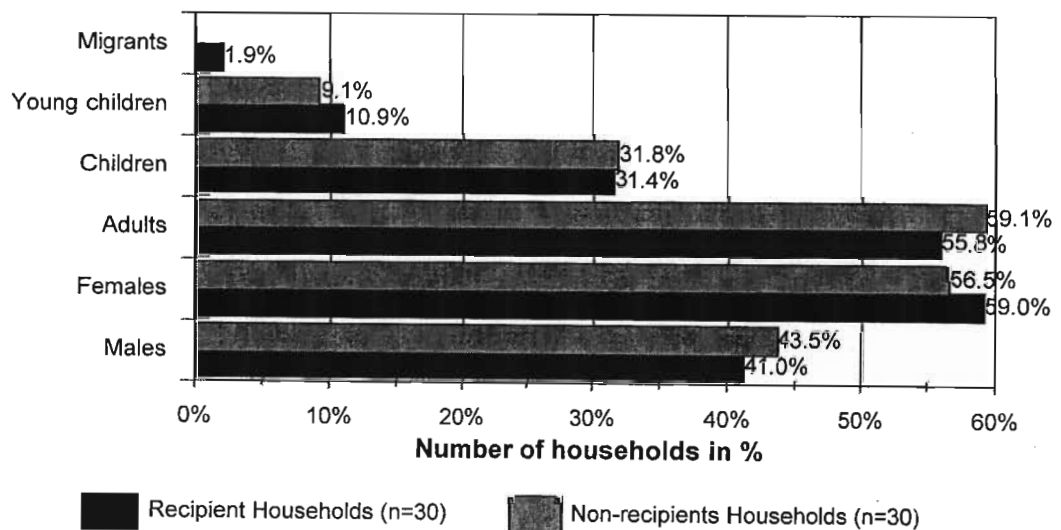
respectively were males (figure 5.1). More than half of all households members were adults (55.8% and 59.1% for recipient and non-recipient households respectively) (figure 5.1).

**Table 5.1: Independent samples test for households composition, 2004, n = 60**

Household characteristic	t-test for Equality of Means		
	t	df	P
Average household size	0.130	58	0.987
Number of males	-0.320	58	0.750
Number of females	0.451	58	0.653
Number of adults	-0.360	58	0.721
Number of children (6-16 years)	0.000	58	1.000
Number of children (<5 years)	0.592	58	0.556
Number of Household members migrated to towns	1.361	29	0.184

P= sig. (2-tailed) results

Children comprised almost one third of households members in each group (31.4% and 31.8% for recipient and non-recipient households respectively) (figure 5.1). Children below five years old comprised approximately one tenth of households members (10.9% and 9.1% for recipient and non-recipient households respectively) (figure 5.1). Two percent of household members in the recipient group had migrated to cities in search of employment. The non-recipient households did not report migrant<sup>1</sup> household members (figure 5.1).



**Figure 5.1: Sample household composition, 2004, n = 60**

### 5.2.2 Characteristics of households heads

There were no significant differences between the gender of households heads of recipient and non-recipient households (table 5.2). On average, the number of male and female headed households in both groups were equal. Households headed by men constituted 56.7 percent of the recipient group compared to 50 percent of non-recipient group (for

<sup>1</sup>Migrant refers to a household member who has left home in search of employment or lives and works away from home and sends home remittances . Visits home on occasions.

frequencies see Appendix E). Women households heads were either widows or single females. All married women regarded their husbands as heads of households.

The t-tests results showed no significant difference between education levels of the households heads between the two groups households (table 5.2). Households heads of both groups had, on average primary education (Appendix F). Fifty and 53 percent of households heads

**Table 5.2: Independent samples test for characteristics of households heads, 2004, n = 60**

Demographic characteristic	t-test for Equality of Means		
	t	df	P
Gender	-0.510	58	0.612
Education level	0.374	58	0.710
Occupation	-1.835	58	0.072

P = sig. (2-tailed) results

for the recipient and non-recipient groups respectively had primary education. Forty percent of household heads in the recipient group had secondary education compared to 30 percent of non-recipient group. No household heads in the recipient group had tertiary education while few (3.3%) households heads in the non-recipient group reported tertiary education.

There were no significant differences between the occupation of households heads of both groups (table 5.2). Households heads of both groups were typically, unemployed (Appendix F). Sixty three percent of households heads in the recipient group compared to 70 percent of the non-recipient group were unemployed. Ninety three percent of heads of households of the recipient households compared to 100 percent of non-recipient households were either not employed or received their income from agriculture, owned business, private employment, and/or pensions. The remaining seven percent of households heads from the recipient households were employed by government. However, the recipients of the food security package had to be unemployed. The Department of Agriculture's food security

beneficiary selection criteria was not specific on the employment status of the head of household, but only outlined that applicants should be unemployed (Free State Department of Agriculture, undated b).

### 5.2.3 Ownership of productive and non-productive assets

Asset ownership is an important indicator of the degree of food insecurity of a household (section 2.4). There were no significant differences between the number of recipient and non-recipient households that owned land (table 5.3). Ninety seven and 87 percent of recipient and non-recipient households respectively, did not own or have access to agricultural land, other than the site on which they had built their houses (for frequencies see Appendix E). No household in either group grew crops on communal land. All households kept backyard gardens.

**Table 5.3 Independent samples test for ownership of productive and non-productive assets, 2004, n = 60**

Ownership of assets	t-test for Equality of means		
	t	df	P
Land	1.401	58	0.167
Cows	1.401	58	0.167
Sheep	0.584	58	0.561
Goats	-1.000	29	0.326
Chickens	-5.385	58	0.000*
House	-0.584	58	0.561
Television	-0.254	58	0.800
Radio	-0.992	55.435	0.325
Jewelry	0.584	58	0.561

P= sig. (2-tailed) results

\* significant at  $p < 0.05$

There were no significant differences between the number of recipient and non-recipient households that owned cows, sheep and goats (table 5.3). Most households did not own livestock. Only three percent of recipient households had cows, sheep, and goats while 13.3 percent, six percent and zero percent of non-recipient households had cows, sheep and goats respectively. There was significant difference between the number of recipient and non-

recipient households that kept chickens (table 5.3). This significant difference was expected as all recipient households received chickens as part of food security package. All recipient households kept chickens compared to half of the non-recipient households.

There were no significant differences in ownership of a house, television, radio and jewelry between recipient and non-recipient households (table 5.3). On average, the number of recipient and non-recipient households that owned a house was almost equal (96.7 % and 93.3% for recipient and non-recipient households respectively). Fifty three percent of recipient households had a television compared to 50 percent of non-recipient households. More than three quarter of households in both groups (87% and 77% of recipient and non-recipient households respectively) owned a radio. Almost all households (97% and 93% of recipient and non-recipient households respectively) did not report owning jewelry.

#### 5.2.4 Household incomes

Sources of household incomes included:

pensions, child support grants, agriculture, remittances, business income and/or salaries. There were no significant differences in income from salaries, pensions, child support grants and remittances between recipient and non-recipient households (table 5.4). Pensions (47.3%) were the major source of income for recipient households (figure 5.2).

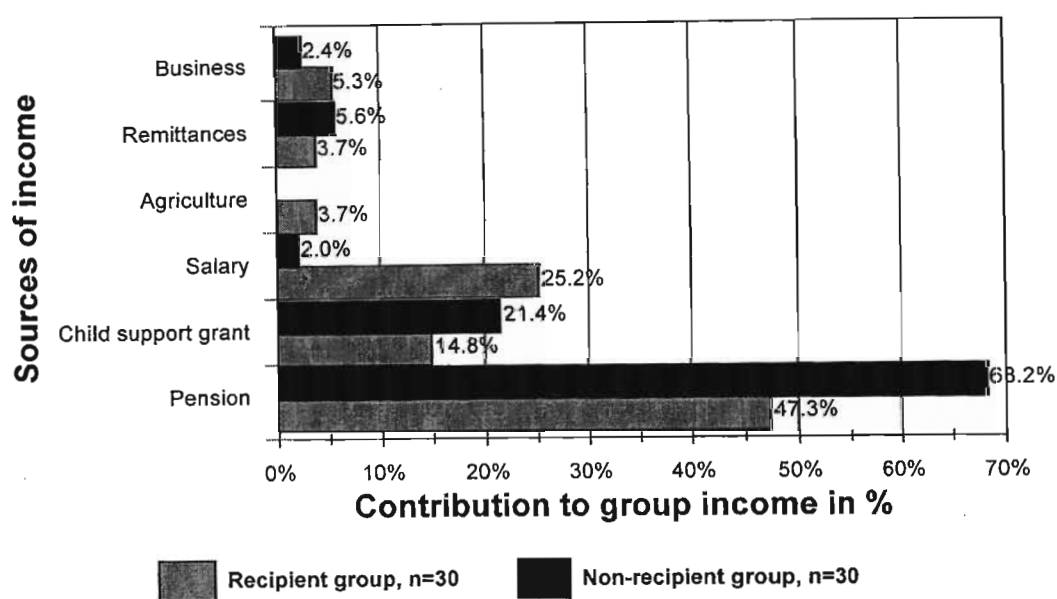
**Table 5.4 Independent samples test for household incomes, 2004, n = 60**

Sources of households incomes	t-test for equality of means		
	t	df	P
Salary	1.401	44.006	0.168
Pension	-1.025	58	0.310
Child support grants	1.025	58	0.31
Remittances	1.027	47.406	0.31
Business	2.047	40.225	0.047*
Agriculture	2.112	29	0.043*
Total household income	0.927	58	0.358

P= sig. (2-tail) results

\* significant at  $p < 0.05$

Income from salaries (25.2%) and child support grants (14.8%) were the second and third major sources of income for recipient households (figure 5.2). In the non-recipient households, income from pensions (68.2%) was a major source of income, followed by child support grants (21.4%) (figure 5.2).



**Figure 5.2: Sources of household income, 2004, n = 60**

Income from salaries accounted for two percent of the total income for non-recipient group households (figure 5.2). Combined, income from both pensions and child support grants contributed 62 percent of the total household income of recipient group households compared to 89.6 percent of non-recipient group households (figure 5.2). This supports the report by the Free State Department of Social Welfare (1999) that Qwaqwa households are largely dependent on income from social grants. Agriculture, remittance and business contributed four , four and five percent to total household income respectively for the recipient group compared to zero, six and two percent of agriculture, remittance and business respectively for the non-recipient group (figure 5.2).

There were significant differences between the number of recipient and non-recipient households that generated income from business and agriculture (table 5.4). Twenty percent of recipient households earned income from business compared to three percent of non-recipient households (for frequencies see Appendix E). Some respondents from recipient households indicated that they were involved in informal businesses such as selling clothes, and public phone services. The non-recipient households did not report income from agriculture, while 13.3% of recipient households did. This could be a direct result of the agricultural intervention since the recipient households received production inputs (refer to chapter 3) used to produce food for household consumption and selling, while non-recipient households did not receive this assistance.

The household income for recipient and non-recipient households ranged from R30 to R2500 and R150 to R1480 respectively. Sixty seven percent of recipient group households compared to 83.3 percent of non-recipient group households lived on less than R194.00 per month per person (this is less<sup>2</sup> than one US Dollar (\$1.00) per day per person) (table 5.5). Eighty percent of recipient group households compared to 63.3 percent of non-recipient group households had a total monthly

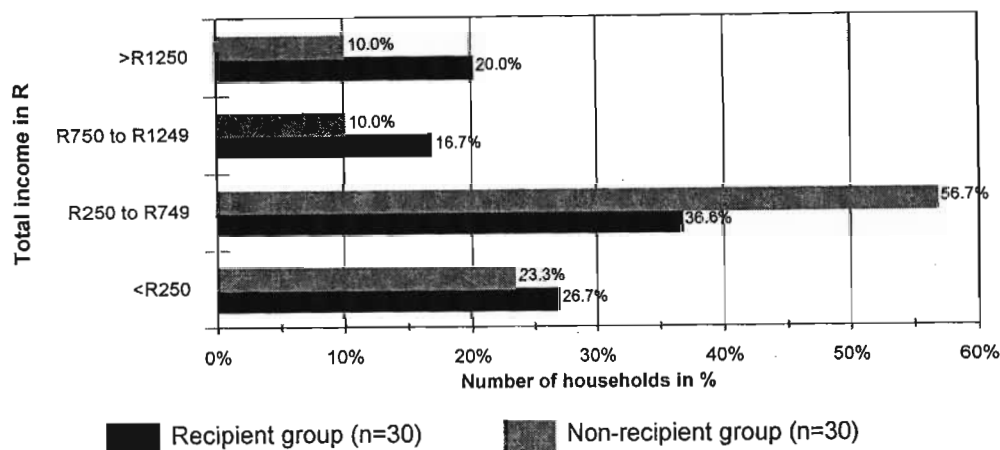
income equivalent to or less than one state pension (R740.00). Just more than a quarter (26.7%) of recipient households had total incomes of less than R250 compared to less than a

**Table 5.5: Households whose individual members lived on an amount less than and equal and above R194.00 per month, 2004, n=60**

Amount lived on per person per month	Recipient group	Non-recipient group
< R194	66.7%	83.3%
≥ R194	33.3%	16.7%

<sup>2</sup>At the time of writing this paper South African Rand/Dollar exchange was R6.50.

quarter (23.3%) of non-recipient households (figure 5.3).



**Figure 5.3** Income range, 2004, n = 60

The majority of households in both recipient (36.6%) and non-recipient groups (56.7%) had total monthly incomes between R250 and R749 (figure 5.3). Twenty percent of recipient households compared to 10 percent of non-recipient households had total monthly household incomes of more than R1250 (figure 5.3). The Free State Department of Agriculture's selection criteria for food security beneficiaries was not specific regarding the total household income. It only stated that to qualify for assistance, the applicant should have little or no personal income (Free State Department of Agriculture, undated b). There was no significant difference between total household incomes of the two groups (table 5.4). The average income of recipient and non-recipient households was R766.37 and R641.33 respectively (Appendix F).

In summary, the t-test results of socio-economic variables of recipient and non-recipient households showed no significant differences between the two groups in terms of household composition and demographic characteristics of households heads. There were



also no significant differences between the groups in terms of ownership of productive and non-productive assets (except for the ownership of chickens by the recipient group as a result of the project) and sources of household incomes (except for incomes from agriculture and business that were seemingly related to the project). It was expected that there would be significant difference in ownership of chickens between recipient and non-recipient group households as chickens were included in the package. The significant differences in incomes from agriculture and business between the two groups, which were higher in recipient than non-recipient group, suggested that the programme could have contributed to increasing these incomes. Therefore, the t-test results ascertained the two groups' similarity, confirming the validity of the comparison (non-recipient) group. The group's similarity also indicated adherence of Department of Agriculture to the food security beneficiary selection criteria. As the socio-economic variables of the recipient and non-recipient households are so similar, the results of the coping strategy index may well show the impact of the project as this is the key element that differentiated the two groups. The next chapter discusses results of the study.

## CHAPTER 6

### RESULTS AND DISCUSSION

This study set out to evaluate the impact of food security packages on recipient Qwaqwa households. The study compared the food security status of recipient (n=30) and non-recipient households (n=30) of food security packages distributed by the Department of Agriculture. An enquiry was made regarding the sources of household income, frequency of consumption of different food types (particularly those included in the package) and the coping strategies applied by both recipient and non-recipient households to compare their food security status (Appendix A). An independent samples t-test was performed on households' frequency of consumption of foods that were included in the package (beetroot, carrots, cabbage, onion, spinach, chicken and eggs<sup>3</sup>), those that were not included in the package (beef, mutton, pork, processed meat and fish) and households' frequency of application of coping strategies to determine the difference between recipient and non-recipient group households.

#### **6.1 Food consumption patterns**

The discussions with survey respondents over food consumption patterns employed by households revealed that food prices, food availability (through own production) and food preferences were the main determinants of the types of food eaten by households and consumption coping strategies households applied. The results of this study showed that household food consumption patterns varied and households included a variety of foods

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<sup>3</sup>Eggs are here included as a bi-product of chickens included in the package

ranging from the cheapest to the most expensive foods per household. For example, spinach was consumed by the highest percentage of households (100%), followed by onion (95%), carrots (93%), cabbage (92%), and beetroot (87%). Chicken was eaten by most households (95%) while beef and mutton were consumed by 32 percent and 28 percent of both groups respectively. Respondents reported that they consumed chicken more often than beef and mutton, as chicken was cheaper. Processed meats were mainly bought for school children's lunches. Survey respondents reported that the lack of money limited dietary diversity and it had become the norm to eat the staple food (pap<sup>4</sup>) with one vegetable only (usually cabbage or spinach). When they could afford to, households ate other foods like beetroot, carrots and meat (typically only on Sundays). Eating a variety of foods is a sign of improvement in food access (Hoddinott and Yohannes, 2002).

The results of the independent samples t-test showed that the differences between the groups' consumption of foods included in the package, with the exception of spinach, were not significant (table 6.1). The results of the study showed that the average consumption of beetroot by recipient households was five times per month compared to four times per month for non-recipient households (Appendix F). More recipient households (33.3%) than their counterparts (20%), ate beetroot and beet leaves<sup>5</sup> more than once a week, signifying greater consumption induced by the inclusion of beetroot seed in the food packages (Appendix E). Beetroot contains carbohydrates and fibre (van Antwerpen, 1993). Beetroot also contains vitamins, iron and minerals although in lower quantities than beet leaves

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<sup>4</sup> Pap is a stiff maize porridge.

<sup>5</sup> The study did not differentiate between consumption of beet's leaves or roots. The study regarded households that ate beet's leaves and/or roots as having eaten beetroot.

(Siemonsma and Piluek, 1993; FAO, 1995b).

Recipient households ate carrots eight times per month compared to five times for non-recipient households (Appendix F). Approximately half (53%) the recipient households (compared to 23% of non-recipient households) ate carrots more than once a week (Appendix E). Carrots are good sources of beta-carotene, vitamin C, calcium and iron (FAO, 1995b). Unlike carrots and

beetroot, for which consumption was higher in recipient than non-recipient households, the results showed that the average monthly frequency of consumption of cabbage, onion and spinach was higher in non-recipient than recipient households (Appendix F).

The non-recipient households' average monthly consumption of cabbage was 17 times a month compared to 13 times per month for recipient households (Appendix F). The results showed that few (10%) recipient households versus nearly half (43%) non-recipient households ate cabbage more than 20 times a month (Appendix E). The frequency of consumption of onion was more than 20 times per month in 40% and 60% of recipient and non-recipient households respectively (Appendix E). Respondents reported that onion was used to improve the flavour of cabbage and spinach. This may have been the reason why

**Table 6.1: Independent samples test for consumption of foods, 2004, n = 60**

	t-test for Equality of means		
	t	df	P
beetroot	-1.356	58	0.180
carrot	1.951	58	0.056
cabbage	-1.725	52.2599	0.090
onion	-0.230	55.577	0.819
spinach	-2.314	58	0.024*
chicken	1.464	58	0.149
beef	-0.665	58	0.508
mutton	-0.673	58	0.504
pork	-0.646	58	0.251
processed meat	1.068	58	0.290
fish	-2.279	46.224	0.027*
eggs	1.661	41.982	0.104

P= sig. (2-tailed) results

\* significant at  $p < 0.05$

the consumption of onion was (contrary to expectation) higher in the non-recipient than recipient households even though it was part of the food security package.

As mentioned in the previous discussions, the t-test results showed that there was significant difference between recipient and non-recipient households' frequency of consumption of spinach. The average monthly consumption of spinach was 18 and 23 times per month in recipient and non-recipient households respectively (Appendix F). Sixty three percent of non-recipient compared to 30 percent of recipient households ate spinach more than 20 times a month (Appendix E). It was indicated previously in this study that household consumption patterns were (among other things) determined by food prices. The reason for higher consumption of cabbage and spinach by households than beetroot and carrots was reportedly because cabbage and spinach were cheaper to buy. Thus, the inclusion of beet and carrots in the food package enabled the majority of recipient households to diversify vegetable consumption.

The average number of eggs consumed per month by each recipient and non-recipient household was 49 and 35 respectively (Appendix F). It was contrary to expectation that 13 percent of recipient households did not consume eggs (Appendix E). This may be attributed to Department of Agriculture's deviation from its food security package specification of giving households twenty-month old village chickens that were capable of producing both meat and eggs (Free State Department of Agriculture, undated a) and poor chicken feeding. However, the Department of Agriculture gave households village chickens dominated by cocks that could only produce meat but not eggs, rather than hens that were capable of producing both meat and eggs. One respondent reported that of the

20 chickens he received, only three were hens. Some households swapped cocks for hens with those who had more hens than cocks. Some households were unable to swop their cocks for hens and so ate the cocks.

This implies that these households had fewer hens than their counterparts and might not have had and eaten as many eggs as their counterparts who had more hens to produce eggs. In addition, many recipient households did not receive twenty-month old chickens that would have been at the point of laying eggs. Rather, some households received chickens ranging from one month to 20 months old. It was estimated that half the recipient households received chicks younger than four months old. Furthermore, it was reported during the survey that up to 90 percent of chicks in one household that were between one and four months old when they arrived, had died. This supports Rangnekar and Rangnekar's (1999) report that young village chickens are plagued by higher mortality rates than the same birds during adult stages (section 2.6.5). In addition, some households in the recipient group reported that not all their hens, that were at the egg producing stage, produced eggs. This may have been due to inadequate feeding since it was observed, during the survey, that recipient group members kept their chickens locked up (day and night) in cages. The cages that were meant to keep village chickens during the night only. As a result the birds were not able to scavenge for food (figure 6.1) and supplement the diets with insects and greens. Respondents claimed that free range chickens ate their neighbours' vegetables. When asked about the type of feed supplied to chickens kept in the coop, some respondents reported that they only fed chickens kitchen waste and claimed that they did not have money to buy supplementary feed. Few respondents reportedly could afford to buy chicken feed. However, buying feed for the village chickens is contrary to

recommendations in literature (FAO, 1998; Branckaert and Gueye, 1999) and contradicts the reason for choosing village chickens as the best strategy for improving the food security situation of poor households through efficient use of scarce available local resources (FAO, 1996b). Though the knowledge of options available for feeding



**Figure 6.1: Picture of a portable village chicken cage, 2004.**

village chickens was not asked, it is possible that these households did not know that they could gather freely available feed such as shrubs and termites to feed village chickens.

However, households from the recipient group who were able to buy feed for their chickens, reported that their chickens produced more eggs, supporting Branckaert and Gueye's (1999) claim that the egg productivity of village chicken and feed quality are linked. These households reported that household members ate eggs three to four times per week. Some recipient households whose chickens produced eggs reported that they did not allow their chickens to breed, instead, they sold eggs locally at 50 cents an egg and used the income accrued from the sale of eggs to buy food such as sugar, mealie meal, salt and chicken livers. FAO (1998) and FAO (2003) report that income accrued from the sale of eggs can be used to purchase food that the household cannot typically produce.

Despite the egg production constraints experienced by the recipient households, few (3%) households in the non-recipient households ate more than sixty eggs per month per household (or 12 eggs per household member per month) compared to about a quarter (27%) of those in the recipient households (Appendix E). It was common for households in the study area to buy 60 or less eggs per month (73% and 97% for recipient and non-recipient groups respectively). This suggested that households that ate more than 60 eggs per month (27% and 3% for recipient and non recipient groups respectively) supplemented home production with purchased eggs.

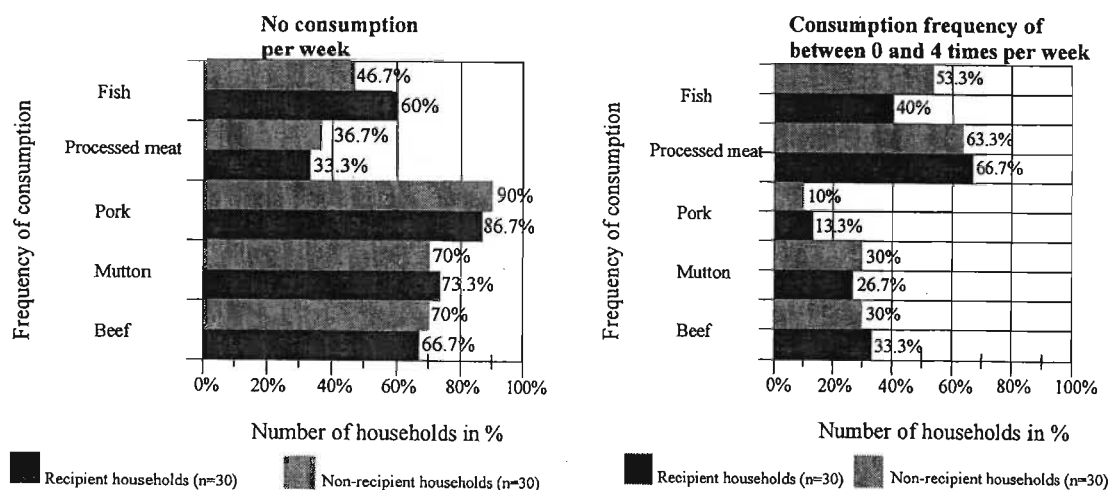
From the report given by recipient households, they did not allow their chickens to breed. Only three percent of recipient households had kept chickens before the programme. Fifty percent of non-recipient households owned chickens (that were not received from the Food Security Programme intervention). However, the results of the study showed that the average consumption of chicken by recipient households was five times per month versus three for non-recipient households (Appendix F). This may be attributed to the fact that the recipient households had eaten the cocks provided by Department of Agriculture. It could also suggest that recipient households purchased chicken with improved income from agriculture and business that was significantly higher than for the non-recipient group.

Foods that were not included in the package (beef, mutton, pork, processed meats and fish) were included in the survey to indicate whether the recipient households's food purchasing power had improved as a result of the packages or not. However, the t-test of the consumption of foods that were not included in the package, with the exception of fish, showed no significant differences between the frequency of consumption of these food



items between the two groups (table 6.1). The possibility that household food preferences could have influenced the consumption of these food was not ignored as respondents were asked during the survey whether members of their households typically ate beef, mutton, processed meats, pork and fish or not.

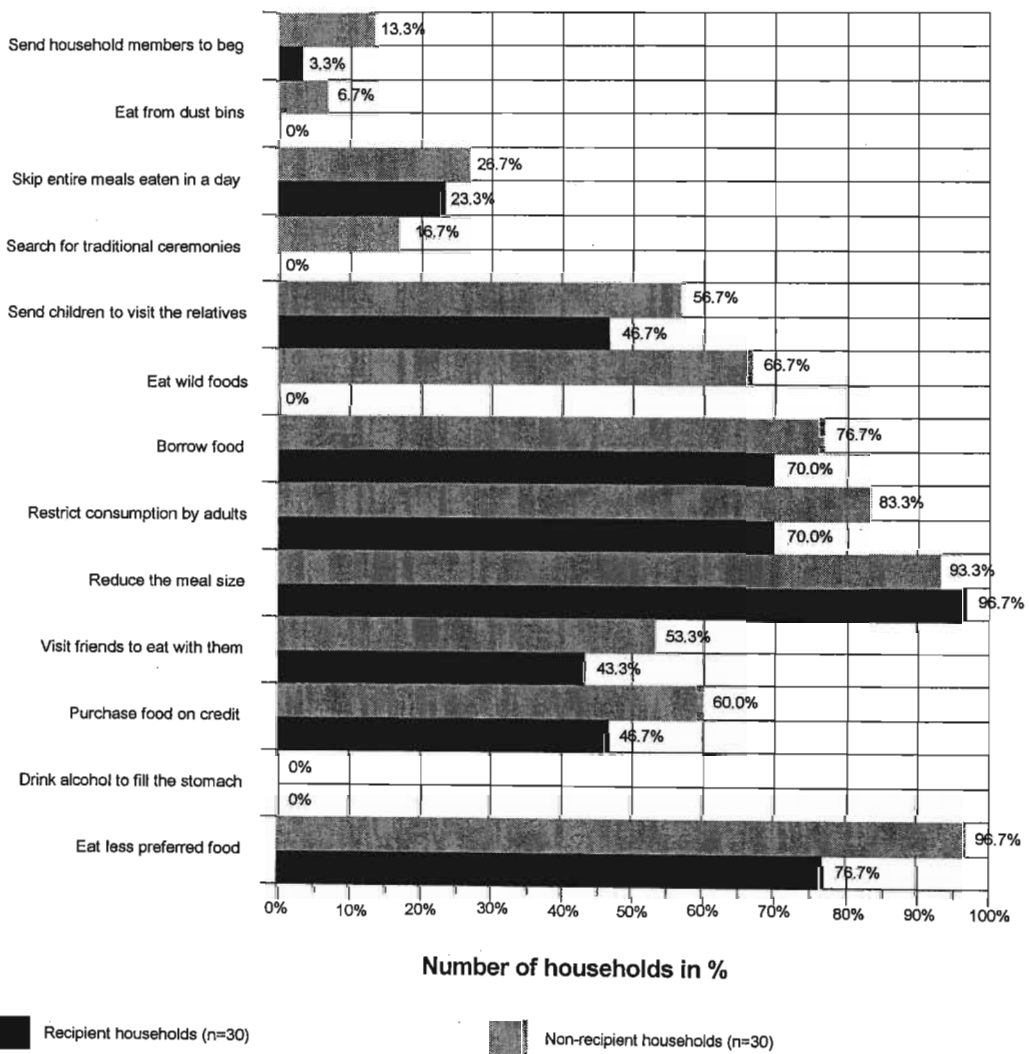
It was found that with the exception of pork, almost all households reported that they normally ate beef, mutton, processed meats and fish. Again, respondents indicated that men preferred red meat. It was expected that the consumption of these foods by members of recipient households would be higher than that of their counterparts because of the extra income generated through sales of vegetables and eggs (FAO, 1998). However, this was not so. In most cases, the frequency of consumption of foods not included in the package was almost similar between groups and where they differed, the differences were very slight (sometimes higher in the recipient, and lower in non-recipient and visa versa) (figure 6.2).



**Figure 6.2: Frequency of weekly consumption of foods not included in food security package, 2004, n=60.**

## 6.2 Coping strategies

Thirteen consumption coping strategies were identified by the workshop participants (section 4.3, table 4.1) as applied by food insecure households in Qwaqwa. However, the results of the study showed that households did not apply all of the identified strategies (Figure 6.3). The responses to questions pertaining to the application of coping strategies are presented in figure 6.3.



**Figure 6.3: Percentage of households that never employed or have employed different coping strategies at all other levels (all the time, pretty often, once in a while and hardly at all), 2004, n=60.**

The thirteen strategies were categorised into different levels according to their severity as

perceived by the workshop participants (section 4.3, table 4.2). The strategies and their frequencies of application by recipient and non-recipient households are discussed below.

### 6.2.1 Least severe coping strategies

The workshop participants identified and classified the coping strategy of eating foods that were less preferred (pap with tea, pap with animal fat, or pap with jam) as least severe coping strategies. The participants reached consensus that less preferred foods were basic foods that every household that does not have enough money to buy preferred foods (such as meat and vegetables) would eat to survive. The workshop participants generally agreed that this was the least drastic measure applied in coping with food shortages.

There was significant difference in the frequency of application of the strategy of eating less preferred foods between recipient and

non-recipient group households (table 6.2). More than three quarters (77%) of recipient households compared to roughly all (97%) non-recipient households applied the least severe coping strategy of eating less preferred

food (figure 6.3). Although some households did not apply this strategy, the majority of households in both recipient (30%) and non-recipient groups (57%) ate less preferred foods pretty often<sup>6</sup> (figure 6.4).

**Table 6.2: Independent samples test for application of least severe coping strategy, 2004, n = 60**

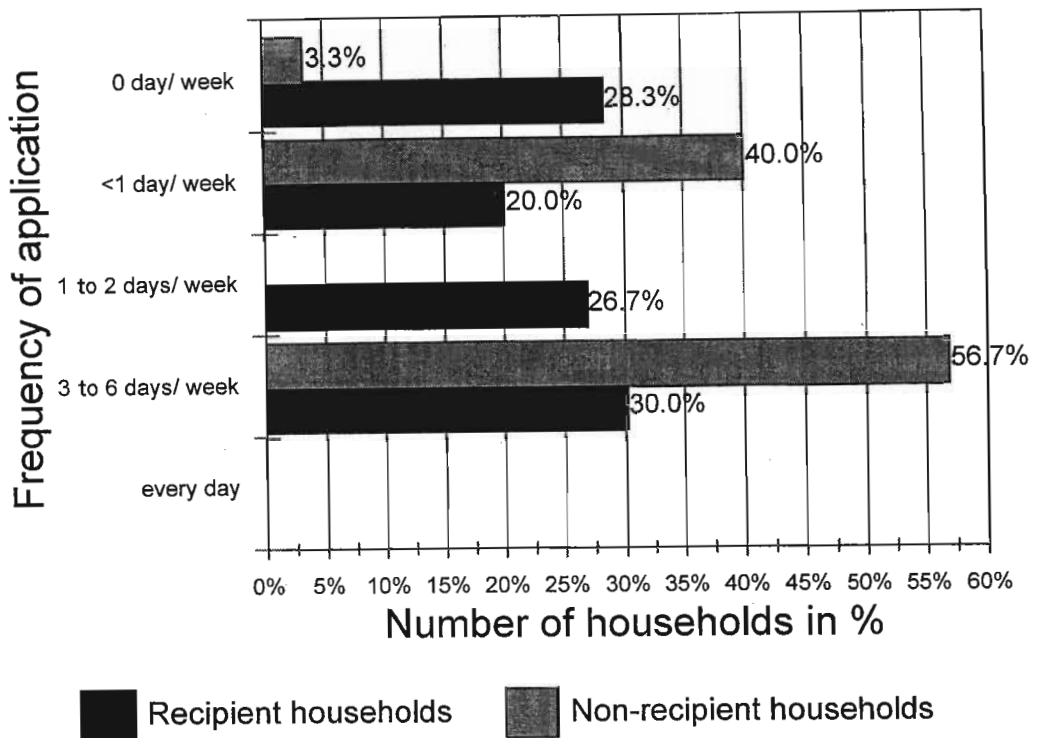
Coping strategy	t-test for Equality of Means		
	t	df	P
Eat less preferred food	-2.918	58	0.005*

P = sig. (2-tailed) results

\* significant at  $p < 0.05$

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<sup>6</sup>Pretty often means the coping strategy was applied 3-6 days a week.



**Figure 6.4: Frequency of application of least severe coping strategy, 2004, n=30 for each recipient and non-recipient households.**

### 6.2.2 Moderately severe coping strategies

The workshop participants identified moderately severe coping strategies as strategies that households often resorted to when their basic foods were in short supply. During this time, households repeatedly started using basic foods sparingly so that foods would last until the next pay day or pension payout or until they received the next portion of food aid from the Department of Social Welfare. The application of moderately severe strategies by survey households is discussed below.

The survey respondents pointed out that only households with fixed monthly incomes were allowed to purchase food on credit from the local village shops because of their perceived

potential to repay debts. Yet, some households that had fixed incomes did not purchase food on credit as they were scared that unforeseen expenses might prevent debt repayment. Maxwell (1995) has explained that purchasing food on credit is a short-term coping strategy with the potential of putting a household in a more vulnerable position in the long-run as it can lead to permanent indebtedness.

There were no significant differences in application of strategies of drinking alcohol to fill the stomach, purchase food on credit, visit friends to eat with them and reduce the meal size between the recipient and non-recipient groups (table 6.3).

**Table 6.3 Independent samples test for application of moderately severe coping strategies, 2004, n = 60**

Coping strategies	t-test for equality of means		
	t	df	P
Drink alcohol to fill the stomach	0	0	0
Purchase food on credit	-1.472	58	0.146
Visit friends to eat with them	-0.975	58	0.334
Reduce the meal size	-1.94	47.051	0.058
Restrict consumption by adults in order for small children to eat	-2.027	51.876	0.048*

P= sig. (2-tailed) results  
\* significant at  $p < 0.05$

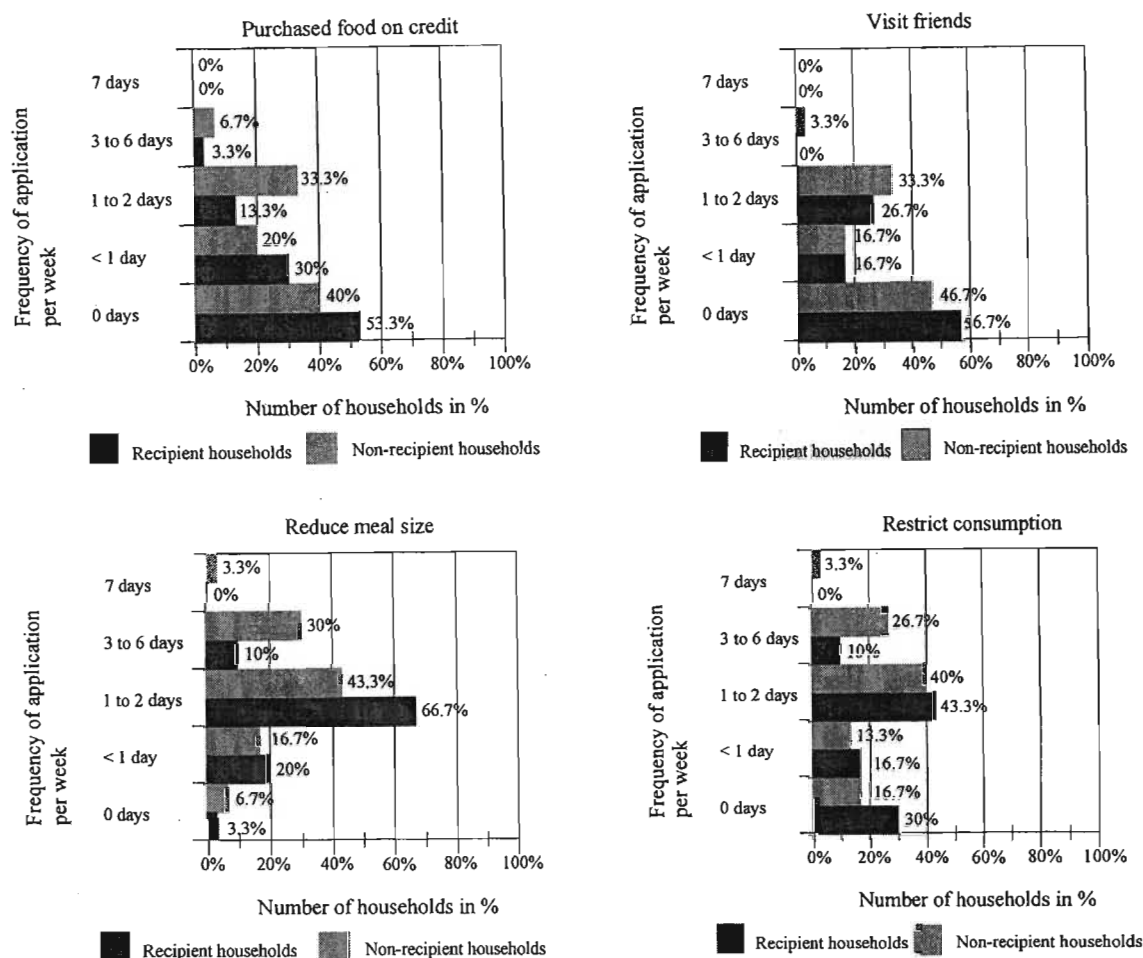
Purchasing food on credit was practiced by just less than half (47%) and just less than two thirds (60%) of recipient and non-recipient households respectively (figure 6.3). Very few (3%) recipient and seven percent of non-recipient households purchased food on credit pretty often (figure 6.5).

The survey respondents reported that children commonly applied the strategy of visiting friends to eat with them. Some respondents reported sending children to visit friends during mealtimes so they could eat with them. Sometimes children, on their own initiative reportedly visited friends and played and ate with them for the whole day because they knew this was the only way of finding food to eat, as there was no food at their own homes.

More households in the non-recipient (53%) than recipient group (43%) visited friends to eat with them in difficult times (figure 6.3). No households in the recipient group, and few (3%) in the non-recipient group visited friends to eat with them (pretty often) (figure 6.5).

Reducing the size of meals served to individual household members was practiced by the majority of households in the recipient group. Nearly all recipient (97%) and non-recipient (93%) households reduced the sizes of meals to cope with food insecurity (figure 6.3). Even though more households in the recipient group reduced the size of meals than non-recipient households, few recipient households (10%) applied this strategy (pretty often) compared to approximately a quarter (30%) of the non-recipient households (figure 6.5). Most respondents said they did not reduce the size of meals when they still had enough food or money in the household, but they did so only when food resources started to wane, to ensure that food lasted until the next pay or grant payout day. Restricting consumption of adults in order for small children to eat was identified as a strategy commonly applied by female rather than male members of households. Respondents reported that adult household members restricted food consumption by eating only one or two meals a day for children to eat three meals a day. There was significant difference in application of the strategy of restricting consumption of food by adults in order for small children to eat between the recipient and non-recipient groups (table 6.3). Seventy percent of adults in the recipient households restricted food consumption in order for small children to eat compared to 83 percent of non-recipient households adult members. Households in which adults restricted their food consumption (pretty often) in order for small children to eat comprised 10 and 27 percent of the recipient and non-recipient groups respectively (figure 6.5). Drinking alcohol to fill the stomach was identified as one of the moderately severe

coping strategies by the workshop participants, yet no households reportedly applied it. Perhaps respondents were ashamed to disclose this information to the researcher.



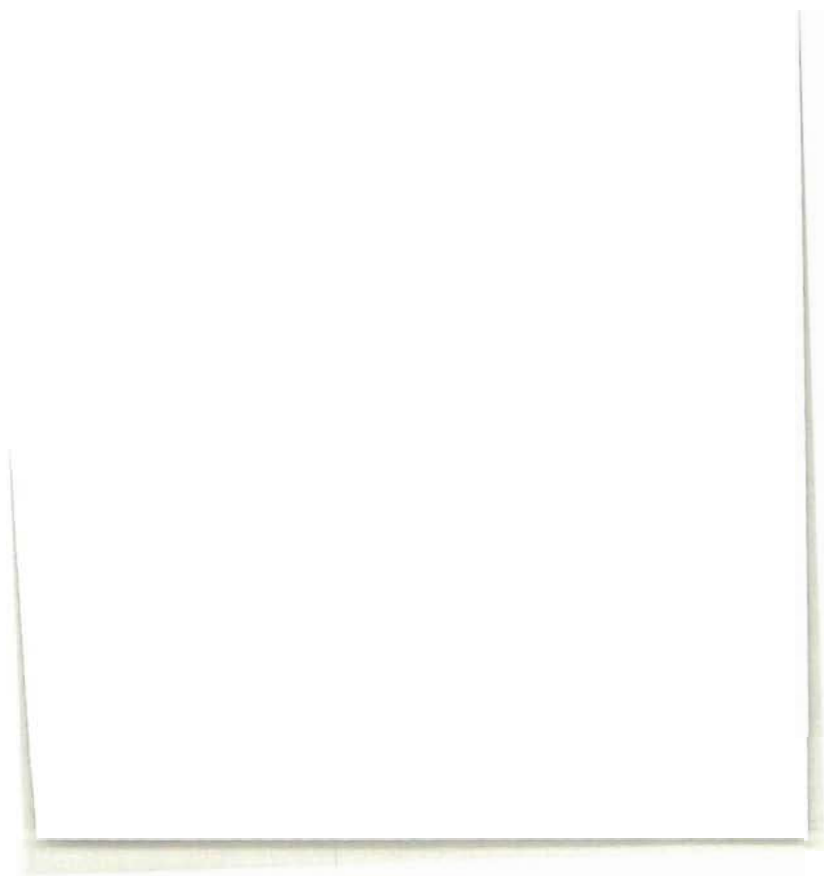
**Figure 6.5: Frequency of application of moderately severe coping strategies, 2004, n=30 for each recipient and non-recipient households.**

### 6.2.3 Severe coping strategies

The workshop participants classified the coping strategies of borrowing food, sending children to visit relatives, eating wild food often, searching for traditional ceremonies and skipping meals as severe measures of coping with food insecurity (section 4.3, table 4.2).

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The survey respondents reported that households applied severe coping strategies when their food resources are totally depleted.

The t-test results shows that there were no significant differences in the application of strategies of borrow food, or rely on help from a friend or relative, eat wild food, send children to visit the relatives and skip entire meals eaten in a day between the recipient and non-recipient groups (table 6.4). Borrowing

food from relatives or friends was a commonly applied practice by both recipient and non-recipient households. Respondents indicated that their application of this strategy was encouraged by the fact that they were not expected to return the food borrowed to them by relatives or friends. Instead, they also gave what they had without expecting it to be returned. Fraser *et al*

(2003) have cited the practice of borrowing or relying on help from relatives or friends as encouraged by strong social networks that rural households often belong to. Seventy percent of recipient households compared to 77 percent of non-recipient households used the strategy of borrowing food (figure 6.3). The majority (37%) of non-recipient households borrowed food pretty often while few (20%) recipient households did (figure 6.6).

The workshop participants mentioned that during weekends and school holidays, food

**Table 6.4 Independent samples test for application of severe coping strategies , 2004, n = 60**

Coping strategies	t-test for equality of means		
	t	df	P
Borrow food, or rely on help from a friend or relative	-0.92	58	0.362
Eat wild food	-1.44	29	0.161
Send children to visit the relatives	-0.76	58	0.454
Search for traditional ceremonies	-2.07	29	0.048*
Skip entire meals eaten in a day	-0.59	58	0.56

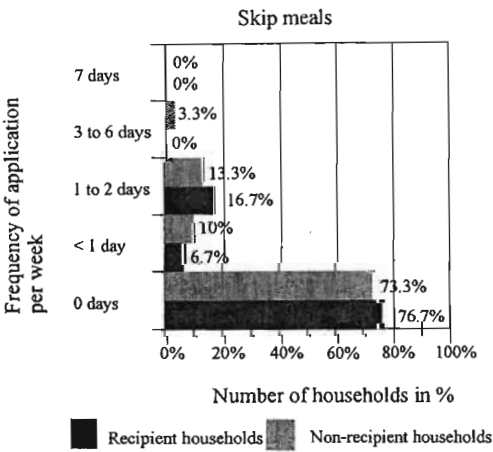
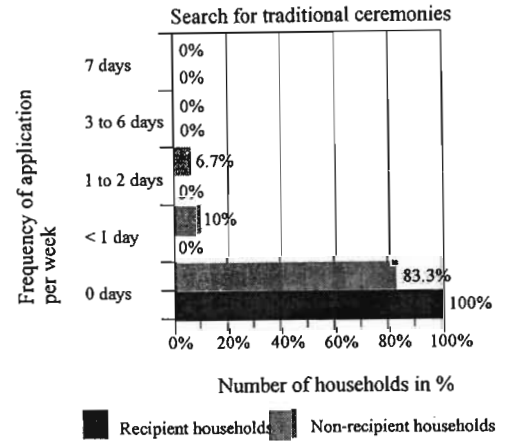
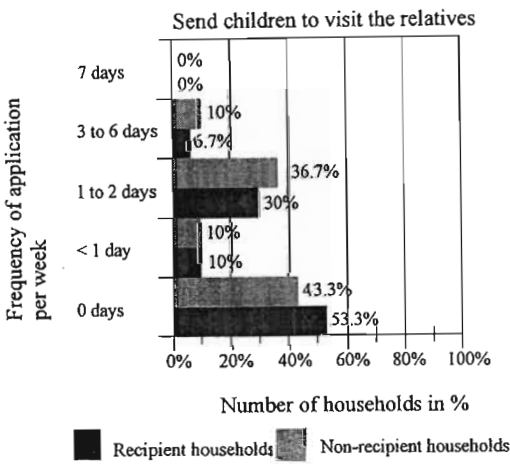
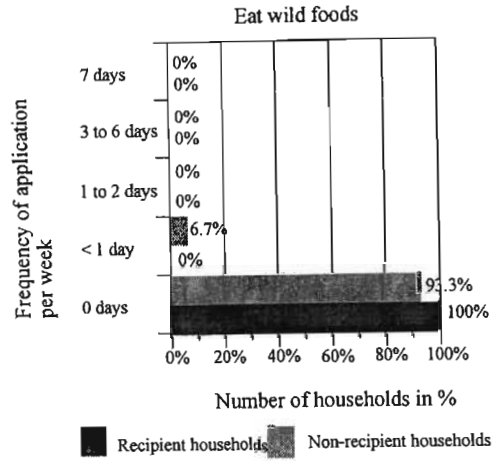
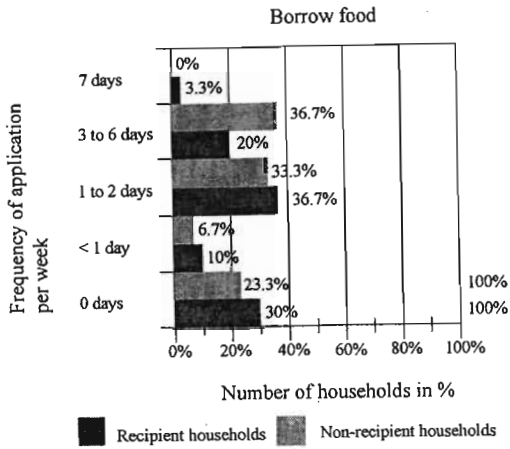
P= sig. (2-tailed) results

\* significant at  $p < 0.05$

insecure households sent children to visit relatives as a way of reducing the number of people who ate from the same pot. However, they reported that the people visited may or may not know the real reason for the children's visit, but may suspect if the visits are frequent that there might be food shortages at the children's homes. Less than half (47%) recipient and more than half (57%) non-recipient households applied the strategy of sending children to visit relatives (figure 6.3). The strategy of sending children to visit the relatives was practiced pretty often by seven percent of recipient and 10 percent non-recipient households (figure 6.6). This means that in both groups there were households that suffered severe food insecurity.

It has been a common practice for people, especially children in this study area to eat wild food because they enjoyed it. However, as a result of food insecurity in households, the workshop participants classified eating wild foods often as one of the severe food insecurity coping strategies. Seven percent of households in the non-recipient group ate wild foods less than once a day, while recipient households did not eat wild foods at all (figure 6.6). Reliance on wild foods is typically indicative of food insecurity.

The workshop participants reported that traditional ceremonies for ancestor worship were common among Qwaqwa residents. The workshop participants reported that during traditional ceremonies, a household slaughtered a cow, sheep or goat and invited neighbors to share the food. To cope with food insecurity, some members of food insecure households made an effort to search for households preparing for a ceremony so they may eat there.



**Figure 6.6: Frequency of application of severe coping strategies, 2004, n=30 for each recipient and non-recipient households.**

There was significant difference in application of the strategy of searching for traditional ceremonies between recipient and non-recipient groups (table 6.4). Recipient households did not search for traditional ceremonies while 17 percent of non-recipient households did (figure 6.3). These non-recipient households were seemingly severely food insecure, justifying their inclusion on the food security beneficiary waiting list.

Households in this study classified the strategy of skipping meals eaten in a day as one of the severe strategies as did households in the study by Maxwell (1995). Few recipient households (23%) skipped the entire day's meal than non-recipient households (27%) (figure 6.3). Few (3%) households of the non-recipient group skipped the entire day's meals pretty often while the recipient group households did not skip the entire day's meals at all (figure 6.6).

#### **6.2.4 Very severe coping strategies**

The workshop participants defined very severe coping strategies as strategies that households applied when their efforts to preserve food resources have been exhausted. The workshop participants asserted that members of households at the very severe level of food insecurity had repeatedly been seen eating from dust bins (scavenging for food) and begging for food from one house to another. In some cases, children went to the extent of stopping cars along the main roads begging for money to buy food. There were no significant differences in application of the strategies of eating from dustbins and sending household members to beg between the recipient and non-recipient groups (table 6.5). Three percent of recipient and 13 percent of non-recipient households sent members out to beg (figure 6.3). The strategy of eating from dustbins was not applied by recipient

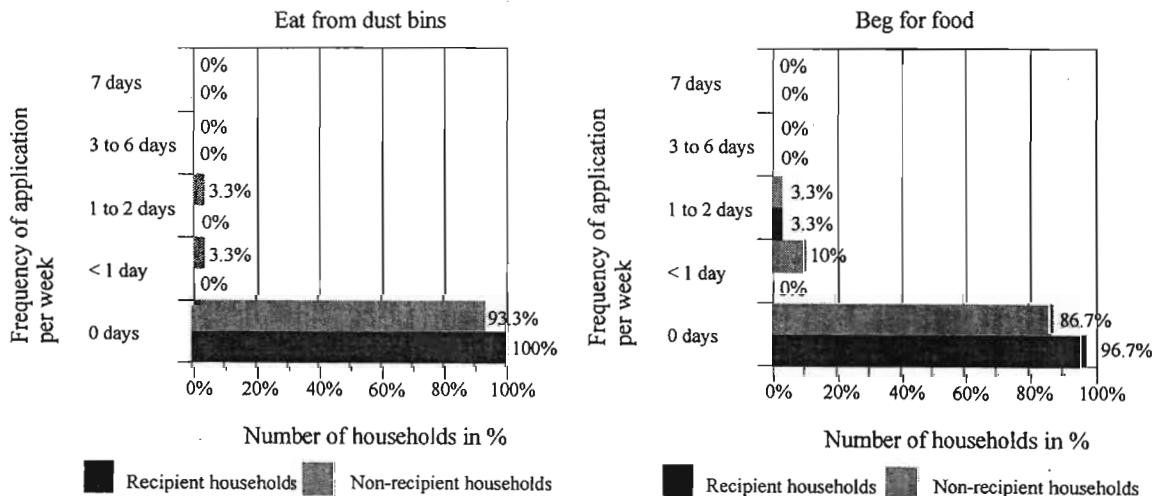
households, while three percent of non-recipient households ate from dustbins once in awhile (1-2 days per week) and another three percent admitted to eating from dustbins less often than once a

**Table 6.5 Independent samples test for application of very severe coping strategies, 2004, n = 60**

Coping strategies	t-test for equality of means		
	t	df	P
Eat from dustbins	-1.278	29	0.211
Send household members to beg	-0.668	58	0.507

P= sig. (2-tailed) results

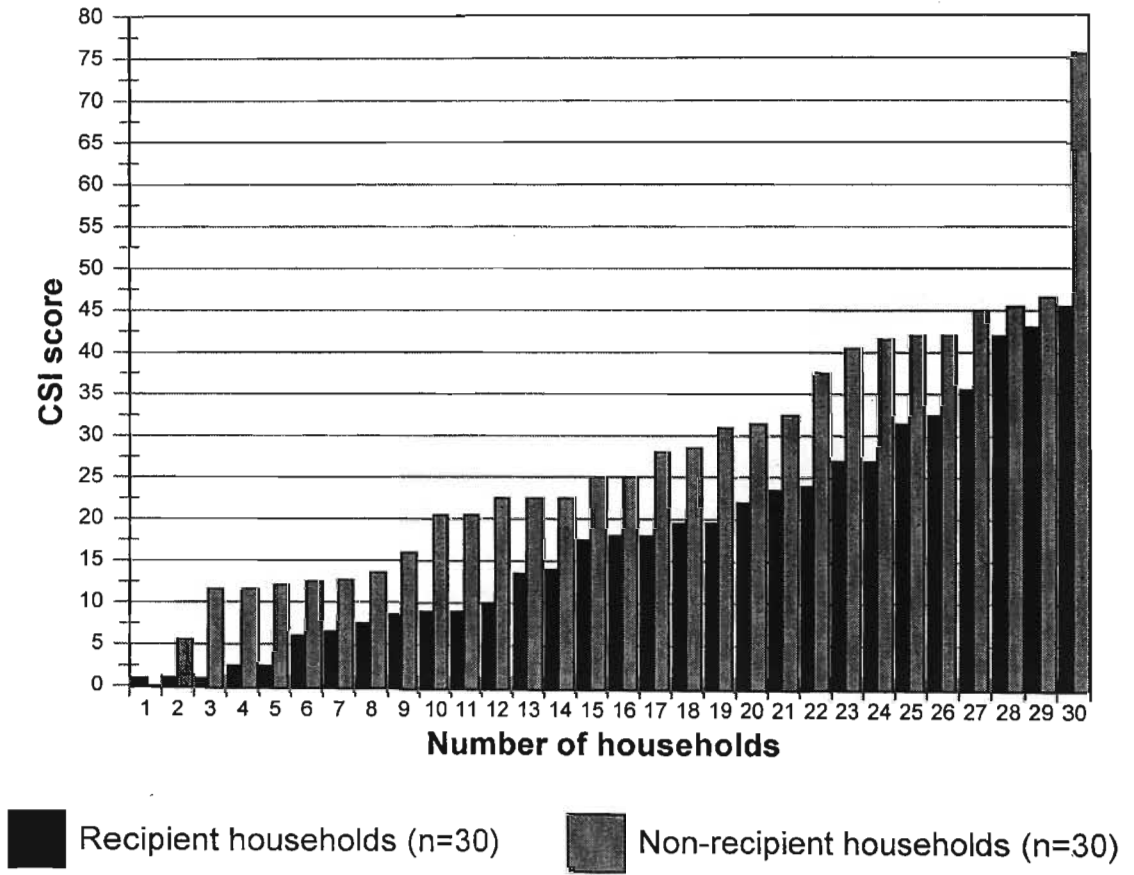
week (figure 6.7). Respondents reported that when they repeatedly experienced food shortages, they became ashamed of borrowing or begging for food and resorted to scavenging. This shows that more non-recipient households resorted to very severe strategies when faced with food insecurity. The non-application of the very severe strategy of eating from dustbins by the recipient households suggests that food packages had, to some extent, improved the recipient households food security status.



**Figure 6.7: Frequency of application of very severe coping strategies, 2004, n=30 for each recipient and non-recipient households.**

**6.3 Coping strategy index score**

A wide range of coping strategy index scores was found for recipient and non-recipient households (figure 6.8). Surprisingly, one household on the waiting list for receiving food security packages did not apply any of the food insecurity coping strategies, while all households from the sample that had received food security packages had applied at least one of the strategies. The household that did not apply coping strategies had a CSI of zero.



**Figure 6.8: Coping strategy index score of individual households, 2004, n = 60.**

According to the CSI score interpretation, the household with a score of zero is food secure as it does not apply any of the food insecurity coping strategies (Maxwell *et al*, 2003). The

reason why this household did not apply any of the coping strategies could be attributed to the fact that it had many productive resources (land, cows, chickens and goats) and was able to produce its own food. This household also had an income of R1140 per month from pensions and agri-business. Although food secure, this household was on the waiting list for the package as the applicant was within the Department of Agriculture Food Security beneficiary criteria as a state pensioner. As expected, the CSI scores, which were meant to make a strong judgement pertaining the impact of the package on recipient group households food security status, differed significantly between the recipient and non-recipient group households (table 6.6). Comparison of the CSI scores revealed that recipient household CSI scores were generally lower than those of their counterparts (figure 6.8) showing that non-recipient

households were generally more food insecure than recipient households showing an improvement following the implementation of programme.

**Table 6.6 Independent samples test for CSI score, 2004, n = 60**

	t-test for equality of means		
	t	df	P
CSI score	-2.218	58	0.030*

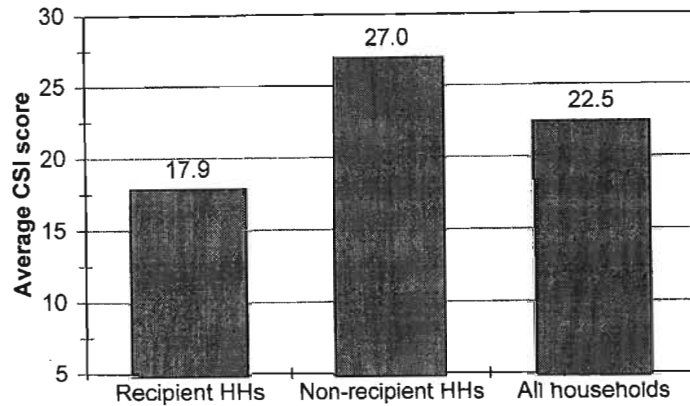
P= sig. (2-tailed) results

\* significant at  $p < 0.05$

One tenth (10%) of recipient households had CSI scores of one, while the lowest CSI score for non-recipient households was six and was attained by seven percent of non-recipient households. The highest CSI score for non-recipient households was 75.5 versus 45 in the recipient households. The average CSI score for the recipients was 17.9 compared to 27.0 of the non-recipient households (figure 6.9). This indicates that non-recipient households reported higher levels of food insecurity than recipient group households. This finding



suggests that the food security packages have improved the food security status of recipient households.

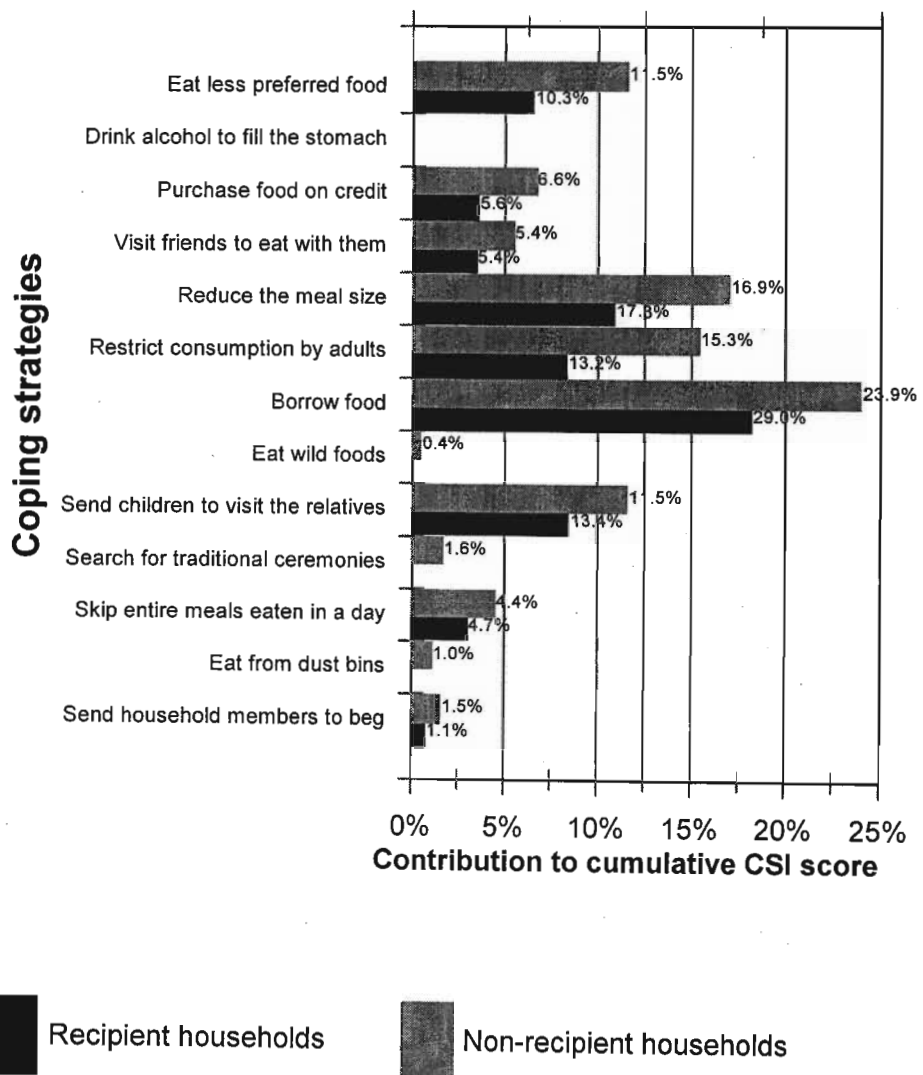


**Figure 6.9: Average coping strategy index scores of households, 2004, n = 60.**

#### 6.4 Coping strategies versus Coping Strategy Index (CSI)

Coping strategy application scores were directly proportional to the CSI score. The strategies of borrowing food and reducing meal sizes contributed the most to both recipient and non-recipient household cumulative CSI scores. In the recipient group, the strategy of borrowing food contributed 29 percent to the cumulative CSI score, while the strategy of reducing meal size contributed 17 percent to the cumulative CSI score (figure 6.10). In the non-recipient group, the strategy of borrowing food and reducing meal size contributed, 24 and 16 percent respectively to the cumulative CSI score (figure 6.10). The least severe strategy of eating less preferred food was positively and significantly related to the cumulative CSI scores of both groups (table 6.7). The moderately severe coping strategy (purchasing food on credit) was not significantly related to the cumulative CSI score in both

recipient and non-recipient groups (table 6.7) Visiting friends to eat with them was not significantly related to the cumulative CSI scores in the non-recipient group, but was significantly related in the recipient group (table 6.7).



**Figure 6.10: Contribution of each coping strategy to cumulative CSI score, 2004, n=30 for each recipient and non-recipient households.**

The other two variables, namely: reducing meal sizes and restricting consumption of adults in order for small children to eat were significantly related to the cumulative CSI scores for the recipient and non-recipient groups respectively (table 6.7). The above correlations show that the two groups used the same moderately severe coping strategies but frequencies of application of these strategies differed (higher in the non-recipient group than in the recipient group).

**Table 6.7: Pearson correlation coefficients for coping strategies and cumulative coping strategy index, 2004, n=60.**

Coping strategies used	Pearson Correlation	
	Cumulative CSI	
	Recipient group(n= 30)	Non-recipient group (n= 30)
<b>C.1 Least severe strategy</b>		
Eat less preferred food	+0.697**	+0.445*
<b>C.2 Moderately severe strategies</b>		
Drink alcohol to fill the stomach	a	a
Purchase food on credit	+0.281	0.004
Visit friends to eat with them	+0.705**	0.282
Reduce the meal size	+0.579**	0.824**
Restrict consumption by adults in order for small children to eat	+0.456*	0.740**
<b>C.3 Severe strategies</b>		
Borrow food, or rely on help from a friend or relative	+0.828**	0.600**
Eat wild food	a	0.283
Send children to visit the relatives	+0.481**	0.648**
Search for traditional ceremonies	a	0.301
Skip entire meals eaten in a day	+0.595**	0.485**
<b>C.4 Very severe strategies</b>		
Eat from dustbins	a	0.353
Send household members to beg	0.397*	0.259

a = cannot be computed because at least one of the variables is constant

\* significant at  $p < 0.05$

\*\* significant at  $p < 0.01$

Overall, the non-recipient group applied moderately severe coping strategies more frequently than recipient group. As the result, the cumulative CSI score was higher for the non-recipient group than for recipient group. This shows that non-recipient households

were moderately food insecure suggesting that food security packages improved food security status of recipient households. The variables of severe coping strategies (eating wild food and searching for traditional ceremonies) were not used by recipient group households. The variables of severe coping strategies (eating wild food and searching for traditional ceremonies) were not significantly related to the cumulative CSI scores of non-recipient households. There was significant positive correlation between the severe coping strategy variables of borrowing food, sending children to visit relatives, and skipping meals eaten in a day and the cumulative CSI score of recipient and non-recipient groups (table 6.7). The results of the Pearson correlations (table 6.7) show that households in the non-recipient group used all five severe coping strategies while those in the recipient group used three of the severe coping strategies.

However, non-recipient households' frequencies of application of the three similar severe coping strategies (borrowing food, sending children to visit relatives and skipping entire meals eaten in a day) was higher than that for the recipient households (figure 6.6). The higher frequency of application of these three severe coping strategies by non-recipient households suggests that non-recipient households were more severely food insecure than recipient households and that food security packages seemingly improved the food security status of recipient households.

The very severe strategies of eating from dustbins was not applied by the recipient group, and was not significantly related to cumulative CSI score in the non-recipient group. The strategy of sending household members to beg for food was positively and significantly related to the cumulative CSI score in the recipient group, but was not significantly related

to the cumulative CSI score in the non-recipient group (table 6.7). The significant positive correlation between the CSI score and begging for food in the recipient group may be influenced by one household (case 40) because it was the only recipient household that applied very severe coping strategy (begging for food).

## 6.5 CSI versus income

Comparison of the Pearson correlation coefficients between the recipient and non-recipient groups revealed that income from business, salaries, agriculture, child support grants and remittances were not significantly related to cumulative CSI score (table 6.8). The only significant correlation among income source variables for the two groups was with income from pensions. This may be because most households received income from pensions as compared to other sources of income (section 5.2.4, figure 5.2) and receipt of a state pension was a criteria for eligibility for the packages (Free State Department of Agriculture, undated a).

**Table 6.8: Pearson correlation coefficients for sources of income and cumulative coping strategy indexes, 2004, n=60.**

	Pearson Correlation	
	Cumulative CSI	
	Recipient households (n= 30)	Non-recipient households (n=30)
<b>1.1 Income sources</b>		
Salaries	-0.298	-0.082
Pensions	-0.488**	-0.470**
Child grants	-0.023	0.268
Business	+0.032	-0.328
Agriculture	-0.066	a
Remittance	+0.190	0.217

a = cannot be computed because at least one of the variables is constant

\* significant at  $p < 0.05$

\*\* significant at  $p < 0.01$

Pensions contributed more (68%) towards non-recipient group income than towards recipient group income (47%) (Appendix E). As income from pensions for the two groups increased, the cumulative CSI score decreased, showing that pensions played a vital role in reducing the need to applying severe coping strategies. This finding supports Bonnard's (2001) finding that an increase in the incomes of poor households increased household food purchasing power.

### **6.6 Food consumption and CSI**

The frequency of food consumed by recipient and non-recipient households per month was not significantly related to the CSI for the following variables: number of eggs and frequency of consumption of beef, pork, processed meats, cabbage, onion and spinach (table 6.9). The frequency of consumption of chicken was strongest and significantly related to the cumulative CSI score for the recipient group (table 6.9). On the other hand, in the non-recipient group, chicken had a negative and significant correlation with the cumulative CSI score (table 6.9). This shows that households reduced application of severe coping strategies when they ate chicken.

As mentioned previously (section 6.1), household food consumption included cheaper and expensive foods, so chicken consumption by households could imply that household income had increased enough to buy chicken as chickens costs more than vegetables (onion, cabbage, spinach, carrots and beetroot). During the survey, mixed feelings regarding the classification of cabbage as either a preferred or less preferred food was identified. Some households reported that they ate cabbage because it was the only food they could afford to buy, not because they preferred it. Yet these households did not

classify cabbage in the category of less preferred foods. Some respondents regarded eating cabbage as better than eating the food they identified as less preferred (pap with water, jam or fat), but still reported that eating cabbage everyday was not desirable. The consumption of cabbage by both recipient and non-recipient groups was not significantly related to the cumulative CSI score, most likely because all households ate cabbage. In the non-recipient group, frequencies of consumption of beetroot and carrots were negatively and significantly related with the cumulative CSI score (table 6.9). The significant correlation of the cumulative CSI score with beetroot and carrots, for non-recipient households could be attributed to the fact that the only time these households ate beetroot and carrots was when they had plenty of food in households, such as on paydays, pension payouts, and/or Sundays.

**Table 6.9: Pearson correlation coefficients for frequency of food consumption and cumulative coping strategy index, 2004, n=60.**

	Pearson Correlation	
	Cumulative CSI	
	Recipient group (n= 30)	Non-recipient group (n=30)
<b>1. Frequency of food consumption</b>		
Egg number	-0.045	-0.172
Chicken	-0.614**	-0.449*
Beef	-0.195	-0.124
Mutton	-0.447*	-0.368*
Pork	-0.215	-0.111
Proc meat	-0.249	-0.198
Fish	-0.170	-0.415*
Beetroot	-0.092	-0.407*
Carrot	-0.007	-0.421*
Cabbage	0.061	0.060
Onion	-0.033	-0.134
Spinach	0.000	0.085

\* significant at  $p < 0.05$

\*\* significant at  $p < 0.01$

This chapter has shown improved food consumption patterns for recipient households in

terms of dietary diversity. Recipient households showed a reduction in the use of coping strategies resulting in lower cumulative CSI score than non-recipient group households. Furthermore, the average coping strategy index score was higher for non-recipient households (27.0), than recipient households (17.9), indicating that non-recipient households seemingly had higher levels of food insecurity than recipient households. The next chapter will discuss conclusions and recommendations.



## CHAPTER 7

### CONCLUSIONS AND RECOMMENDATIONS

This study set out to evaluate the impact of food security packages on Qwaqwa households using Maxwell *et al's* (2003) Coping Strategy Index. A questionnaire was developed to collect data on household demographics, food consumption patterns and the application of consumption coping strategies identified by a community level focus group. The food security status of package recipient (n=30) and non-recipient households (n=30) was compared by calculating and comparing the coping strategy index scores of households in the two groups. All recipient households were surveyed and a control group (30 households) was randomly selected from households on the waiting list for receiving food security packages.

There were marked differences in the recipient and non-recipient household frequencies of consumption of foods included in the Department of Agriculture food security packages and the application of coping strategies. First, the frequency of consumption of foods included in packages (carrot, beetroot, eggs as by-product of chicken, and chicken) was higher in the recipient than non-recipient households. The recipient households' food consumption patterns improved as more households diversified their food while only a few non-recipient households diversified their food. Second, some of the coping strategies (eating less preferred food, purchasing food on credit, visiting friends to eat with them, restricting consumption of adults in order for small children to eat, borrowing food, sending children to visit relatives, skipping entire meals eaten in a day, reducing meal sizes, and sending household members out to beg) applied by recipient and non-recipient households

were similar, but frequency of application of these strategies differed. The frequency of application of similar strategies was higher in non-recipient households. Non-recipient households applied more severe and very severe strategies (borrowing food, sending children to visit relatives, skipping entire meals eaten in a day, eating wild food, searching for traditional ceremonies, eating from dust bins and begging for food) more often than recipient households. This showed that non-recipient households were more likely food insecure than recipient households.

The three main findings of the study regarding the application of coping strategies were: the non-recipient group applied more severe and very severe coping strategies than recipient households; the frequency of application of similar strategies by the two groups was higher in non-recipient than the recipient households; and non-recipient households had higher coping strategy index scores (were more food insecure) than recipient households. Finally, the recipient households' average coping strategy index score was lower than that of the non-recipient group households indicating that recipient households were more likely food secure than non-recipient households.

## **7.1 Conclusions**

Generally, the Department of Agriculture's food security programme has attained its goal as the results of the study showed that food security tended to be higher among recipient than non-recipient households. Therefore, the hypothesis that food security packages have contributed to improving household food security can be accepted as:

- a. Dietary diversity was improved,
- b. Food frequency, particularly of carrots, beetroot, eggs and chicken improved,

- c. Income from agriculture increased,
- d. Severe and very severe strategies applied were fewer and applied less often. This showed that the food security packages certainly reduced the necessity of applying the very severe strategies. For example, the recipient households did not apply the very severe strategy of eating from dustbins.

However, the deviation of the Department of Agriculture from the original plan of giving twenty-month old chickens, to giving younger stock to households, constrained the envisioned benefits of village chickens as:

- a. Most of the chickens were too young to produce eggs,
- b. A large number of chickens died.
- c. Households were given more cocks than hens.

In addition, lack of scavenging space and recipient households' lack of knowledge that they can harvest freely available feed for their chickens led to inadequate chicken feeding and consequently low egg productivity.

## **7.2 Policy implications and recommendations for improvement of the programme**

Despite the above mentioned constraining factors, the results of the study showed that food security packages had positive impacts on household food security. This suggests that if an action can be taken to resolve the above mentioned constraining factors (lack of suitable scavenging space for the chickens and lack of knowledge of freely available chicken feed) the positive impact of food security packages could be considerably higher than is currently experienced. Improved household food security programmes require a vision that exceeds

counting the number of people supported, but also requires a conducive environment in which packages will be managed and converted into food or cash to improve household food purchasing power. The following actions are recommended to improve the impact of the Free State Department of Agriculture's food security package.

First, the Department of Agriculture should familiarise itself with, and apply the guidelines for management of village poultry as stipulated by the Special Programme for Food Security (SPFS) for proper management of the chickens namely, disease control, feeding and housing. Second, a feasibility study to assess the suitability of the area for the type of intervention (specifically keeping village chickens) planned should be undertaken prior to implementation to improve chances for achieving the intended intervention goals. In the case of village poultry, a suitability assessment should include assessing if there is enough area for the village chicken to scavenge, and feed for the chickens to scavenge. The Extension Officers and households could be trained in village chicken rearing.

Third, research should be conducted to identify a village chicken breed that can easily adapt to local conditions. This can be done by studying the local breeds of village chickens, find out how they are managed, and investigate their meat and egg productivity potential and hardiness. Fourth, the Department of Agriculture should continue to include village chickens as part of its food security packages as village chicken provide a cheap source animal protein. However, the Department of Agriculture should adhere to the original specification of supplying twenty-month old chickens as at that age chickens are resistant to diseases and mortality rate is lower. Chickens at twenty-month old are already at the point of laying eggs, giving households immediate benefits of the food security program

and act as an incentive to keep village chickens.

The Department of Agriculture should continue to include vegetable in its food security packages as this had a positive influence on households' dietary diversity. Households could be trained in effective water management strategies such as roof water harvesting and recycling of used water (water from the kitchen and bath room), and efficient use of water as scarce resource. It is recommended that the Department of Agriculture should set a household income criteria for food security beneficiaries that is equivalent to two state pensions to ensure that food packages are given to low income households that are committed to effectively and efficiently use food security packages to improve their food security status. It is recommended that the Department of Agriculture should use Coping Strategy Index for identifying food insecure households and for monitoring and evaluating the impact of the food security programme.

### **7.3 Recommendations for improvement of the study**

The questionnaire led to forced responses that might have directed the respondents' responses and denied them the opportunity to give more information. The study could have combined the questionnaire method with an observation method to validate the respondents' responses. The respondents self-reported food insecurity problems. They could have intentionally exaggerated their food insecurity problems with the hope of being targeted for government support. The study assessed household food security status for the past thirty days during the rainy season when there might have been an abundance of produce. The study could have been conducted during the rainy and dry (hunger period) seasons to assess year round household food security status. The household food security

data was collected during the implementation of the Food Security Programme. It may have been better if household food security data was collected before and during implementation of the intervention to compare the results of recipient household application of coping strategies before and during the intervention to monitor changes in application of coping strategies and determine if these changes were a direct result of the intervention.

The study compared the coping strategy index score of recipient and non-recipient households. However, the study could have obtained recipient group households' CSI score at the start of the programme and continued to obtain the CSI score of the same households quarterly for a year. This would have enabled the analyst to monitor individual household food insecurity status by comparing quarterly CSI scores. The results of the comparison of each household's quarterly CSI scores could have resulted in estimating the relative (to other households in the sample) food security status of each recipient group household and monitor change.

It was assumed that recipient households practiced correct vegetable production techniques. The study could have assessed vegetable production techniques applied by recipient households to determine whether households applied measures that optimised production of seeds included in the package. The study also assumed that household members knew the correct food preparation and preservation methods that ensure that nutrients are not destroyed during food preparation. The study could have assessed food preparation and preservation techniques employed by recipient households to find out if they derive expected nutritional benefits from the package.

## REFERENCES

- Alders RG, Finge R, Mata B (1997). Village Chicken production in Bilene District Mozambique: Current practices and problems. Proceedings of the IFPD Workshop, M'bour, Senegal. December 9-13. Maputo: National Veterinary Research Institute.
- Aliber M, Modiselle S (2002). Pilot study on methods to monitor household-level food security for the National Department of Agriculture. [WWW document] URL: <http://www.sarpn.org.za/documents/d0000274/index.php> (Accessed 23 January 2005).
- Berti PR, Krasevec J, FitzGerald S (2003). A review of the effectiveness of agriculture interventions in improving nutrition outcomes. Ottawa: Programme for Appropriate Technology in Health.
- Boardman M (undated). Seasonal food security and the challenges for development practice. Connecticut: Praeger Publishers.
- Bonnard P (2001). Improving the nutrition impacts of agriculture interventions: Strategy and policy brief. Connecticut: Food and Nutrition Technical Assistance Project.
- Borrel A (2001). Addressing the nutritional needs of older people in emergency situations: Ideas for action. Dublin: Emergency Nutrition Network.
- Boudreau T (1998). The Food Economy Approach: A framework for understanding rural livelihoods. Relief and Rehabilitation Network Paper No. 26. London: Overseas

Development Institute.

Branckaert RDS, Gueye EF (1999). FAO's Programme for Support to Family Poultry Production. Paper presented at the Development Workers' Tune Course: Poultry as a tool in poverty eradication and promotion of gender equality, 22 - 26 March 1999, Tune, Denmark.

Brink S (2001). Lack of Food Security: Focussed literature review and research framework. Hull: Applied Research Branch.

Carletto C, Morris SS (1999). Designing methods for the monitoring and evaluation of household food security rural development projects. Washington DC: International Food Policy Research Institute.

Chung K, Haddad L, Ramakrishna J, Riely F (1997). Alternative approaches to locating the food insecure: Qualitative and quantitative evidence from South India. Discussion Paper No. 22. Washington DC: Food Consumption and Nutrition Division, International Food and Policy Research Institute.

Coates J, Webb P, Houser R (2003). Measuring food insecurity: Going beyond indicators of income and anthropometry. Washington DC: Food and Nutrition Technical Assistance (FANTA) Academy.

Community Planning and Development Office (2002). Suggested procedures for conducting a simple survey to determine whether the majority of persons in a target area



have low and moderate incomes. [WWW document] URL:

[http://www.meocd.org/library/2002\\_CDBG\\_Program\\_Materials/Surveys/Survey\\_Methodology.pdf](http://www.meocd.org/library/2002_CDBG_Program_Materials/Surveys/Survey_Methodology.pdf) (Accessed 10 May 2004).

Department of Agriculture and Land Affairs (1997). Food Security Policy for South Africa: A discussion document by the Food Security Working Group. Pretoria: Agricultural Policy Research Unit.

De Swart C (2002). Unravelling chronic poverty in South Africa: Some food for thought. Paper presented at an International Conference: Staying poor: Chronic poverty and development policy, University of Manchester, 7 to 9 April. [WWW document] URL: <http://idpm.man.ac.uk/cprc/Conference/conferencepapers/deswardtpaper.pdf>. (Accessed 10 December 2004).

Diskin P (1995). Understanding linkages among food availability, access, consumption, and nutrition in Africa. Empirical findings and issues from literature. Technical paper No.11, Michigan State University, East Lansing: AMEX International.

Faber M, Phunghula M, Venter SL, Kvalsvig JD, Benadé S (2002). A household food production project to address household food security with special reference to vitamin A deficiency. *South African Journal of Clinical Nutrition*: 15 (3): S14.

FAO (1995a). Improving nutrition through home gardening: A training package for preparing field workers in Southern Asia. Rome: FAO.

FAO (1995b). South Pacific Commission: Community health services. [WWW document]  
URL: <http://www.fao.org/WAIRdocs/x5425e/x5425e05htm> (Accessed 12 June 2004).

Food and Agriculture Organisations (FAO) (1996a). Rome declaration on world food security. World Food Summit. 13-17 November. Rome: FAO.

FAO (1996b). Food Security and Nutrition: World food summit technical background documents. Volume 1. [WWW document] URL:  
<http://www.fao.org/wfs/final/e/volume1/t5sum-e.htm>. (Accessed 18 August 2004).

FAO (1997). Agriculture food and nutrition for Africa: A resource book for teachers of agriculture. Rome: FAO Information Division.

FAO (1998). Village chicken production systems in rural Africa: Household food security and gender issues: Animal Production and Health Paper 142. Rome: Desktop Publishing Management Group.

FAO (2001a). Farming systems and poverty. Rome: FAO.

FAO (2001b). Improving nutrition through home gardening: A training package for preparing field workers in Africa. Rome: FAO.

FAO (2003). Poultry keeping: A life saver for poor rural households. [WWW. document]  
URL: <http://www.fao.org/english/newsroom/news/2003/13201-en.html> (Accessed 20 June 2004).

FAO and International Life Sciences Institute (ILSI) (1997). A manual for policy makers and programme planners: Preventing micronutrient malnutrition; A guide to food-based approaches. Washington DC: International Life Sciences Institute.

Food and Nutrition Technical Assistance (FANTA) (2002). Dietary diversity as a household food security indicator. Technical Note No. 4. Washington DC: Academy for Educational Development.

Frankenberger TR (1992). Indicators and data collection methods for assessing household food security. In: Maxwell S and Frankenberger TR (eds.). Household Food Security: Concepts, indicators and measurement, A technical review. New York and Rome: UNICEF and IFAD. pp 73-134.

Fraser G, Mondé N, van Averbeké W (2003). The challenge of change: A case study of rural livelihood in the Eastern Cape. In Niewoudt K and Groenewaldt J (eds.). Food security in South Africa: Pietermaritzburg: University of Natal Press.

Free State Department of Agriculture (undated a). Integrated Food Security and Nutrition Programme Roll-out Plan: Free State Department of Agriculture. Bloemfontein: Free State Department of Agriculture.

Free State Department of Agriculture (undated b). Food Security Programme Working Document. Bloemfontein: Free State Department of Agriculture.

Free State Department of Social Welfare (1999). Poverty Eradication Strategy for the Free

State, South Africa. Draft 4. Bloemfontein: Free State Department of Social Welfare.

Gladwin CH, Thomson AM, Stirling, Scotland (undated). Food or cash crops: Which is the key to food security? [WWW document]. URL:

<http://www.fred.ifas.ufl.edu/CRSP/food.htm>. (Accessed 12 December 2003).

Gueye (1998). Village egg and fowl meat production in Africa. *World's Poultry Science Journal* 54: 73-86.

Gueye, Fallou EIH (2000). Women and family poultry production in rural Africa. *Development in Practice*: 10 (1), p98.

Haddad L, Zeller M (1996). How can safety nets do more with less? General issues with some evidence from southern Africa. Discussion paper number 16. Washington DC: International Food Policy Research Institute.

Hendriks SL (2003). The potential for nutritional benefits from increased agricultural production in rural KwaZulu-Natal. *South African Journal of Agricultural Extension*, 32: 28-44.

Hoddinott J, Yohannes Y (2002). Dietary diversity as a household food security indicator. Washington DC: Food and Nutrition Technical Assistance Project.

Hoddinott J (1999). Operationalising household food security in development projects: An introduction. Washington DC: International Food Policy Research Institute.

Huysamen GK (1994). *Methodology for the Social and Behavioural Sciences*. Halfway House: Southern Book Publishers.

Labadarios D (undated). Executive summary. In Labadarios, D (ed). *The National Food Consumption Survey (NFCS): children aged 1-9 years, South Africa, 1999*. [WWW document]. URL: <http://www.sahealthinfo.org/nutrition/foodsummary.htm>. (Accessed 28 November 2004).

Marsh R (1998). Building on traditional gardening to improve household food security. *Food, Nutrition and Agriculture: 22: 4-13*.

Martin TM (1998). *Survey Research: Conducting surveys*. [WWW document]. URL: <http://www.azplansite.com/survey.htm> (Accessed 30 July 2004).

Maxwell S, Frankenberger TR (1992). *Household Food Security: Annotated bibliography*. New York and Rome: UNICEF/IFAD.

Maxwell DG (1995). *Measuring Food Insecurity: The frequency and severity of "coping strategies"*. FNCD discussion paper (8). Washington DC. Food Consumption and Nutrition Division: IFPR.

Maxwell D, Watkins B, Wheeler R, Collins G (2003). *The Coping Strategy Index: A tool for rapidly measuring food security and the impact of food aid programmes in emergencies*. Paper from the Food and Agricultural Organisation (FAO) International Workshop on Food

Security in Complex Emergencies: Building policy frameworks to address longer-term programming challenges, 23-25 September, Tivoli. Rome: FAO.

Moreki JC, Petheram RJ, Tyler L (1997). A study of small scale poultry production systems in Serowe-Palapye sub-district of Botswana. Proceedings of the INFPD Workshop, Senegal. December 9-13, Malepulele: Department of Animal Health and Production.

Nanama S, Frongillo EA (2003). Understanding measuring household food security in northern Burkina Faso. [WWW document] URL:  
<http://lombila.uni-ouaga.bf/fn2ouaga2003/html/anoralabstracts.html>. (Accessed 18 August 2004).

National Agricultural Marketing Council (2002). The food security effects of deregulation of agricultural marketing in South Africa. Report by Ebony Consultancy International (ECI) to the National Agricultural Marketing Council. Pretoria: Ebony Consultancy International.

National Department of Agriculture (2002). The integrated food security strategy for South Africa. Pretoria: National Department of Agriculture.

National Department of Agriculture (1993). Vegetable production: Spinach beet. Pretoria: National Department of Agriculture.

Nell W, Wessels B, Mokoka J and Machedi S (2000). A creative multi-disciplinary approach towards the development of food gardening. *Development Southern Africa* 17 (5): 807-819.

Ngongi SN (1996). Rural poultry systems and the role rural women play in their management. *In INFPD Newsletter* 9 (1): 9-9.

New South Wales Department of Health (2003). Food security options paper: A planning framework and menu of options for policy and practice interventions. Gladesville: NSW Health.

Ntsebeza L (1999). Land tenure reform in South Africa: An example from the eastern Cape Province. Paper from the DFID workshop on Land Rights and Sustainable Development in sub-Saharan Africa, 16-19 February. Berkshire: DFID

Permin A, Hansen JW (1998). Epidemiology, diagnosis and control of poultry parasites. *INFPD Newsletter* 9 (1): 14-14.

Quisumbing A (2003). Nutrition and food aid different modalities, different impacts, lessons from Ethiopia, forthcoming in *World Development* Washington DC: IFPR/ WFP.

Rangnekar SD, Rangnekar DV (1999). Developing traditional family poultry production in the tribal belt of western India. [WWW document]. URL:

<http://www.fao.org/WAICENT/FAOINFO/AGRICULT/AGA/AGAP/lps/fampo/freecom5.htm> (Accessed 30 July 2004).

Riely F, Mock N, Cogill B, Bailey L, Kenefic E (1999). Food security indicators and framework for use in the monitoring and evaluation of food aid programs. Washington DC: USAID.

Riely F (2000). FIVIMS synthesis document: A comparison of vulnerability analysis methods and rationale for their use in different contexts. Preliminary draft paper. [WWW document] URL: <http://www.fivims.net/documents/RielyVGProfilingMethodsAnnex.doc>. (Accessed 18 August 2004).

Rose D, Charlton KE (2002). Quantitative indicators from a food expenditure survey can be used to target the food insecure in South Africa. *Journal of Nutrition* 132:3235-3242.

Rubin A, Babbie E (1997). Research Methods for Social Work. Washington DC: International Thomson Publishing Company.

Ruel M and Levin C (2000). Assessing the potential for food based strategies to reduce vitamin A and iron deficiencies: A review of recent evidence. Washington DC. International Food Policy Research Institute.

Rugalema G (2000). Coping or struggling? A journey into the impact of HIV/AIDS in Southern Africa. *Review of African Political Economy* 28 (86): 537-545.

Schmidt MI and Vorster HH (1995). The effects of communal vegetable gardens on nutritional status. *Development Southern Africa*: 12(5): 713-724.



Siemonsma J and Piluek K (1993). Plant resources of south-east Asia: Vegetables. Wageningen: Pudoc Scientific.

Saad MB (1999). Food security for the food-insecure: New challenges and renewed commitments. CSD NGO Women's Caucus Position Paper for CSD-6, 2000. Dublin: Centre for Development Studies, University of Dublin.

Sharma RP (1992). Monitoring access to food and household food security. [WWW. document]. URL: <http://www.fao.org/docrep/U805t/u8050t02.htm> (Accessed 18 June 2004).

Silverside D, Jones M (1992). Small-scale poultry processing. Rome: FAO.

Southern African Development Community (SADC) (2003). Towards identifying the impact of HIV/AIDS on food security in southern Africa and implications for responses: Findings from Malawi, Zambia and Zimbabwe. Harare: SADC Food, Agriculture and Natural Resources Vulnerability Assessment Committee.

Swatson HK, Nsahlai IV, Byebwa B (2001). The status of smallholder poultry production in the Alfred District of Kwazulu-Natal, South Africa: Priorities for intervention. Proceedings of the 10<sup>th</sup> Conference of the Association of Institutions for Tropical Veterinary Medicine, Copenhagen, Denmark.

Tulane (1992). Livelihood security. [WWW.document]. URL: <http://www.tulane.edu/~panda2/FS/introduction/FS%20Introduction.htm>. (Accessed 22

December 2003).

UNICEF (1998). Stunting linked to impaired intellectual development. [WWW document].

URL: <http://www.unicef.org/sowc98/panel3.htm> (Accessed 23 December 2004).

Uys M (1997). *Grow Your Own Vegetables and Herbs*. Human and Rousseau: Cape Town.

van Antwerpen E (1993). *Vegetable Cultivation: A practical handbook*. Third edition. Longman: Windhoek.

van Niekerk EMJ (2000). Community based strategies for a sustainable built environment for informal settlements in Qwaqwa. Proceedings of the Strategies for a Sustainable Built Environment, 23-25 August 2000. Pretoria:

Vitamin Information Centre (VIC) (2001). National Food Consumption Survey in children aged 1-9 years: South Africa 1999. Medical Update Number 37. [WWW document]. URL: [http://www.nutrivit.co.za/professionals/medical\\_updates/nfcs\\_37.pdf](http://www.nutrivit.co.za/professionals/medical_updates/nfcs_37.pdf). (Accessed 23 August 2004).

Woolfe SW, Frongillo EA (2000). Building household food security measurement from the ground up: Background paper. Washington DC: Food and Technical Assistance Project.

World Bank (1998). Nutritional status and poverty in Sub-Saharan Africa. [WWW document] URL: <http://www.worldbank.org/arf/findings/english/find108.htm> (Accessed 23 August 2004).

## APPENDIX A

### A QUESTIONNAIRE FOR EVALUATING THE IMPACT OF FOOD SECURITY PROGRAMME IN QWAQWA

#### Part 1

#### General information

Survey code

A.1 Interviewee is the head of the household

Yes  No

A.2 Gender of the head of the household

Male  Female

A.3 Age of head of household

A.4 Education of the head of a household

(1) No schooling   
(2) Primary Education (1-5 years)   
(3) Secondary Education (6-12 years)   
(4) Tertiary Education (> 12 years)

A.5 Occupation of the head of household

(1) Agriculture   
(2) Own Business   
(3) Government employee   
(4) Private employee   
(5) Not employed

(6) Retired

(7) Other

A.6 Sources of household income

Source of income	Amount of income (R)/day/week/fort night/month
(1) Salaries	
(2) Pension	
(3) Child support grants	
(4) Business	
(5) Agriculture	
(6) Remittances	
(7) Other	

A.7 Number of persons living in a household

A.8 Number of males living in a household

A.9 Number of females living in a household

A.10 Number of adults (>16 years)

A.11 Number of children (6-16 years)

A.12 Number of children (<5 years)

A.13 Number of household members migrated to towns

A.14 Ownership of productive assets

(1) land Yes  No

(2) cow Yes  No

(3) sheep Yes  No

(4) chicken Yes  No

(5) goat Yes  No

A.15 Ownership of non-productive assets

(1) house Yes  No

(2) television Yes  No

(3) radio Yes  No

(4) jewelry Yes  No

A.16 Number of children at school

## Part 2

### Programme related information

A17 Number of eggs are eaten in a household

per week   per month

A18 Number of times chicken is eaten in a household

per week   per month

A.19 Number of times the following types of meat are eaten in a household

Meat type	Number of times eaten per week	Number of times eaten per month
(1) beef		
(2) mutton		
(3) pork		
(4) processed meats		
(5) fresh fish / tinned fish		

A.20 Number of times beetroot is eaten in a household

per week   per month

A.21 Number of times carrots is eaten in a household

per week   per month

A.22 Number of times cabbage is eaten in a household

per week   per month

A. 23 Number of times onion is eaten in a household

per week   per month

A.24 Number of times spinach is eaten in a household

per week   per month

**Part 3**

**Consumption Coping Strategy Response (CSI)**

In the past 30 days , if there have been times you did not have enough food or money to buy food, how often has your household had to:	Relative Frequency				
	All the time? Every day	Pretty often? 3-6 days/week	Once in a while? 1-2 days/week	Hardly at all? < day/week	Never 0 day
A.25 rely on less preferred foods (pap and tea, animal fat, and jam)?					
A.26 drink alcohol to fill the stomach?					
A. 27 eat from dustbins?					
A.28 borrow food?					
A.29 eat wild food?					
A.30 send household members to beg?					
A.31 purchase food on credit ?					
A.32 visit friends to eat with them?					
A.33 send children to visit the relatives?					
A34. search for traditional ceremonies?					
A.35 reduce the meal size?					
A.36 restrict consumption by adults in order for small children to eat?					
A.37 skip entire meals eaten in a day?					



## Appendix B

### WORKSHOP ATTENDANCE REGISTER

NO	NAME	ORGANISATION	TEL NUMBER	FAX NUMBER
1	Matshidiso Motaung	Community member	N/A	N/A
2	Catherine Motaung	Community member	N/A	N/A
3	Nozika Mjwaga	Department of Agriculture	058 7891077	0587891076
4	Ntsoaki Sello	Department of Education	058 7184781	058 7131218
5	Maria Lepasa	Community member	058 7134016	N/A
6	Mookho Matau Molise	Community member	N/A	N/A
7	Matoane Mokhachane	Department of Agriculture	058 7141430	058 7141447
8	Moloi KZ	Department of Agriculture	058 7141430	0587141447
9	Leonorah Mofokeng	Community member	N/A	N/A
10	Makhopela KJ	Department of Agriculture	058 3035167	058 3037669
11	Dlamin PH	Department of Agriculture	058 7141439	058 7140403
12	Mphuthi MS	Department of Agriculture	058 7141430	058 7141447
13	Lephoro KP	Department of Agriculture	058 2231123	058 2231123
14	Mcangu KF	Community member	N/A	N/A
15	Setlopho BA	Department of Agriculture	058 7132262	058 7130653
16	Komako M	Department of Agriculture	058 7132262	058 7130653
17	Khiba M	Community member	N/A	N/A
18	Motaung L	Community member	N/A	N/A
19	Ntjingila B	Intabazwe Home Based Care	073 5421058	N/A
20	Rajoela M	Intabazwe Home Based Care	073 5421058	N/A
21	Phalatsi TJ	Department of Agriculture	0734678681	058 7141447
22	Makhasane MR	Department of Agriculture	058 7141429	058 7141447
23	Moru P	Save the Children	058 7130136	N/A
24	Radebe JB	Department of Agriculture	058 7141445	058 7140403
25	Msibi JM	Department of Agriculture	058 7893138	058 7891076
26	Moloi TR	I.C.A	N/A	N/A
27	Koali T	Department of Agriculture	N/A	N/A
28	Mofokeng M	Community member	N/A	N/A
29	Mokoena M	Community member	N/A	N/A
30	Boku	TMDM	0833624941	058 7130940
31	Nhlanhla E	Intabazwe	058 6231739	
32	Mosia S	Mashaeng	0833701752	058 2230964
33	Dlamini J	CCF	083 5515287	058 7130653
34	Olyn T	Department of Social Development	073 3147954	058 7132995
35	Ramagula L	Department of Social Development	073 358863	058 7132995
36	Malete MJ	Department of Agriculture	058 7130699	058 7130927
37	Mohale MC	Department of Agriculture	N/A	N/A
38	Nortjie L	Department of Agriculture	0722798850	058 9240619
39	Makhopela RJ	Department of Agriculture	0826695180	058 3037669
40	Majake D	Department of Agriculture	058 7141430	058 7141447
41	Mofokeng E	Community member	058 789 6053	N/A
42	Polaki M	Community member	N/A	N/A
43	Polaki T	Community member	N/A	N/A
44	Klaas P	Community member	N/A	N/A
45	Metsing M	Community member	N/A	N/A
46	Moloi N	Department of Health	058 7130515	N/A
47	Koae J	Community member	N/A	N/A
48	Mokoena S	Community member	N/A	N/A

## APPENDIX C: Code list and survey data

Respondent number	respono		
Food security package	fspack:	received	= 1
		not received	= 2
A1. Interviewee is the head of the household	head:	yes	= 1
		no	= 2
A2. Gender of the head of a household	genhead	male	= 1
		female	= 2
A3. Age of the head of a household	agehead		
A4. Education of the head of a household	eduhead:	no schooling	= 1
		primary education	= 2
		secondary education	= 3
		tertiary education	= 4
A5. Occupation of the head of household	occuhead:	agriculture	= 1
		own business	= 2
		government employee	= 3
		private employee	= 4
		not employed	= 5
		retired	= 6
		domestic worker	= 7
A6. Sources of household income	salary:	incsal:	= 1
		pension:	inpen = 2
	child support grants:	inchilgr = 3	
	business:	incbus = 4	

	agriculture:	inagric	= 5
	remittances:	remitt	= 6
A6.1. Total household income		tincome	
A7. Number of persons living in a household		houseno	
A8. Number of males living in a household		maleno	
A9. Number of females living in a household		femaleno	
A10. Number of adults (>16 years)		adultno	
A11. Number of children (6-16 years)		childno	
A12. Number of children (<5 years)		ychildno	
A13. Number of household members migrated to towns		migrated	
A14.1. Ownership of land	land:		yes = 1 no = 2
A14.2. Ownership of cow	cow:		yes = 1 no = 2
A14.3. Ownership of sheep	sheep:		yes = 1 no = 2
A14.4. Ownership of chicken	chick:		yes = 1 no = 2
A14.5. Ownership of goat	goat:		yes = 1 no = 2
A15.1. Ownership of house	house:		yes = 1 no = 2
A15.2 Ownership of television	tv:		yes = 1 no = 2

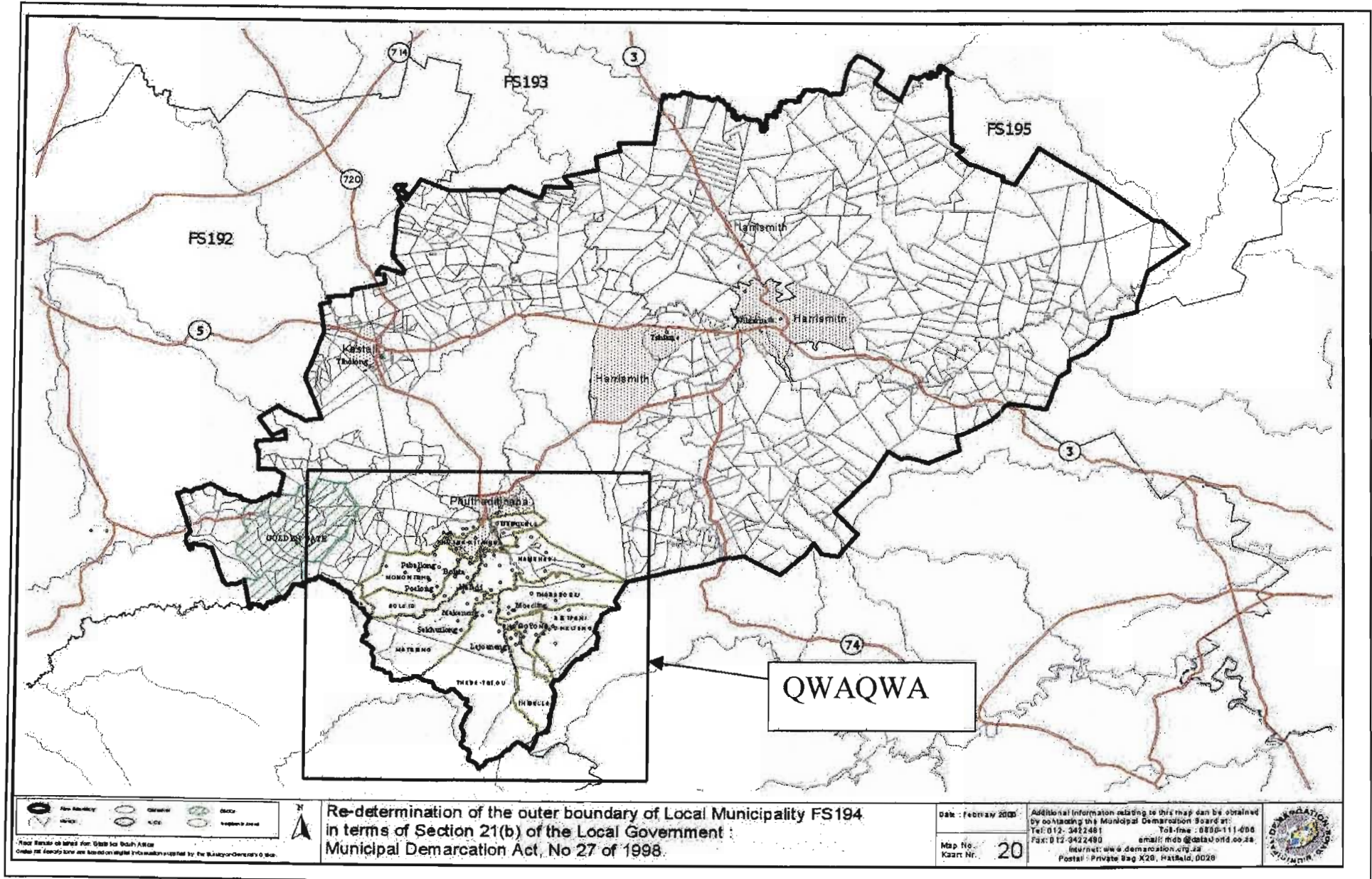
A15.3. Ownership of radio	radio:	yes = 1 no = 2
A15.4. Ownership of jewelry	jewelry:	yes = 1 no = 2
A16. Number of children at school		= school
A17. Number of eggs eaten in a household per month		= eggno
A18. Number of times chicken is eaten in a household per month		= chicken
A19.1. Number of times beef is eaten in a household per month		= beef
A19.2. Number of times mutton is eaten in a household per month		= mutton
A19.3 Number of times pork is eaten in a household per month		= pork
A19.4 Number of times processed meat is eaten in a household per month		= procmeat
A19.5 Number of times fish is eaten in a household per month		= fish
A20. Number of times beetroot is eaten in a household per month		= beetroot
A21. Number of times carrot is eaten in a household per month		= carrot
A22. Number of times cabbage is eaten in a household per month		= cabbage
A23. Number of times onion is eaten in a household per month		= onion
A24. Number of times spinach is eaten in a household per month		= spinach
A25. Rely on less preferred foods pap and tea, animal fat and jam?		= prefere
A26. Drink alcohol to fill the stomach?		= alcohol
A27. Eat from dustbins?		= dustbin
A28. Borrow food?		= borrow
A29 Eat wild food?		= wild
A30 Send household members to beg?		= beg
A31. Purchase food on credit?		= credit

A32. Visit friends to eat with them?	= friend
A33. Send children to eat with relatives?	= sendchil
A34. Search for traditional ceremonies?	= ceremony
A35. Reduce the meal size?	= mealsize
A36. Restrict consumption by adults in order for small children to eat?	= restcon
A37. Skip entire meals eaten in a day?	= skipmeal
Coping Strategy Index score	= CSI



pork	procmeat	fish	beetroot	carrot	cabbage	onion	spinach	prefere	alcohol	dustbin	borrow	wild	beg	credit	friend	sendch	ceremony	mealsize	restcon	skipmeal	CSI
0	2	0	4	4	12	31	31	0.5	0	0	0	0	0	0	0	0	0	1	1	0	2.5
1	1	0	4	4	1	12	12	0	0	0	0	0	0	0	0	0	0	1	0	0	1
0	8	8	12	12	12	12	12	0	0	0	4.5	0	0	0	0	0	0	3	0	0	7.5
0	1	0	8	8	8	8	8	4.5	0	0	4.5	0	0	0	1	1.5	0	9	3	0	23.5
0	14	0	12	12	12	12	12	0	0	0	0	0	0	1	0	0	0	0	0	0	1
0	0	0	12	12	8	20	12	4.5	0	0	0	0	0	1	0	13.5	0	3	0	0	22
0	0	0	8	8	4	20	20	1.5	0	0	13.5	0	0	0	0	0	0	3	0	0	18
0	2	0	4	4	24	24	24	0	0	0	4.5	0	0	1	0	13.5	0	3	9	1.5	32.5
0	2	1	4	4	16	28	16	0.5	0	0	0	0	0	1	0	0	0	1	0	0	2.5
0	0	0	4	4	16	24	16	1.5	0	0	1.5	0	0	1	1	0	0	3	1	0	9
0	2	0	8	8	16	16	16	1.5	0	0	0	0	0	0	0	0	0	3	9	0	13.5
0	0	0	1	1	16	16	16	0	0	0	0	0	0	0	0	0	0	1	0	0	1
1	1	1	1	1	2	12	20	0.5	0	0	0	0	0	0	0	0	0	3	3	0	6.5
0	3	3	12	12	20	20	16	0.5	0	0	4.5	0	0	3	0	0	0	3	3	0	14
1	1	0	12	12	20	20	20	0.5	0	0	0	0	0	1	0	1.5	0	3	3	0	9
0	16	1	4	4	16	31	24	4.5	0	0	4.5	0	0	3	3	1.5	0	3	0	0	19.5
0	0	0	8	8	12	28	12	4.5	0	0	13.5	0	0	0	1	4.5	0	9	3	0	35.5
0	2	1	1	4	28	28	28	0	0	0	4.5	0	0	3	0	0	0	1	0	0	8.5
0	0	2	4	4	16	16	16	0.5	0	0	1.5	0	0	0	0	0	0	3	1	0	6
0	2	2	4	1	12	31	12	4.5	0	0	13.5	0	0	0	1	4.5	0	1	1	1.5	27
0	2	1	0	25	0	25	31	1.5	0	0	4.5	0	0	0	1	4.5	0	3	3	0	17.5
0	1	0	2	2	20	20	20	1.5	0	0	13.5	0	0	9	3	4.5	0	3	3	4.5	42
0	0	0	0	0	8	0	20	4.5	0	0	21	0	6	1	3	0	0	9	1	0	45.5
1	0	3	20	20	20	28	28	4.5	0	0	4.5	0	0	0	3	4.5	0	3	3	4.5	27
0	1	2	3	12	8	28	28	1.5	0	0	4.5	0	0	0	3	4.5	0	3	3	0	19.5
0	1	0	4	1	24	24	24	4.5	0	0	13.5	0	0	1	3	4.5	0	3	9	4.5	43
0	0	0	1	8	0	8	3	1.5	0	0	4.5	0	0	0	3	4.5	0	3	3	4.5	24
0	0	0	0	20	0	3	7	4.5	0	0	13.5	0	0	0	3	0	0	3	3	4.5	31.5
0	3	1	1	12	12	12	12	0	0	0	4.5	0	0	3	0	4.5	0	3	3	0	18
0	4	0	2	6	12	3	21	1.5	0	0	1.5	0	0	1	0	0	0	3	3	0	10
0	1	8	4	4	8	12	12	1.5	0	0	1.5	0	0	3	0	1.5	0	3	3	0	13.5
0	2	0	4	4	4	12	12	4.5	0	0	0	0	0	1	0	0	0	3	3	0	11.5
0	3	6	1	1	28	28	16	1.5	0	0	4.5	0	2	3	1	4.5	0	3	3	0	22.5
0	0	0	1	1	12	0	16	4.5	0	2	13.5	0	2	3	3	13.5	1.5	14	14	4.5	75.5
0	4	6	12	16	28	28	28	1.5	0	0	4.5	0	0	1	0	1.5	0	3	3	1.5	16
0	3	0	12	12	24	24	28	1.5	0	0	4.5	0	0	1	1	0	0	3	1	0	12
1	4	3	8	8	12	28	20	1.5	0	0	13.5	0	6	0	0	0	0	9	1	0	31
0	3	3	4	4	16	28	24	1.5	0	0	13.5	0	0	3	0	1.5	0	3	0	0	22.5
0	2	1	8	8	16	28	25	4.5	0	0	13.5	0	0	0	0	4.5	0	9	9	4.5	45
0	0	0	1	1	30	30	30	4.5	0	0	13.5	0	0	0	3	13.5	0	9	3	0	46.5
0	0	1	4	4	8	12	28	4.5	0	0	0	0	0	0	0	0	0	9	9	0	22.5
0	0	0	4	4	12	28	28	1.5	0	0	13.5	0	0	0	0	13.5	0	3	0	0	31.5
0	0	0	0	0	28	28	12	4.5	0	0	13.5	0	0	0	0	0	1.5	9	9	0	37.5
0	2	0	4	4	28	28	28	4.5	0	0	4.5	0	0	9	0	4.5	0	9	9	0	40.5
0	1	0	0	0	24	28	31	4.5	0	0	13.5	0	0	0	1	4.5	1.5	3	3	1.5	32.5
0	0	8	4	4	20	31	31	4.5	0	0	4.5	0	0	1	9	0	0	3	3	0	25
0	0	0	8	1	28	28	28	1.5	0	0	4.5	0	0	9	0	0	0	1	9	0	25
0	1	0	4	12	24	24	28	1.5	0	0	0	0	0	3	0	0	0	1	0	0	5.5
0	0	2	12	28	12	28	16	1.5	0	0	4.5	0	0	1	0	4.5	0	0	0	0	11.5
0	0	8	4	4	28	31	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	1	1	2	0	3	6	4	1.5	0	0	1.5	0	0	0	3	4.5	0	9	9	13.5	42
3	2	3	4	4	8	8	28	4.5	0	0	13.5	0	0	3	3	0	0	1	3	0	28
3	2	0	2	2	0	7	8	4.5	0	0	0	0	0	3	3	0	0	1	1	0	12.5
0	3	0	0	1	31	31	31	4.5	0	6	4.5	1.5	0	0	3	4.5	0	9	9	0	42
0	1	1	0	2	31	21	31	4.5	0	0	13.5	0	0	1	3	4.5	4.5	3	3	4.5	41.5
0	0	0	0	1	0	0	31	4.5	0	0	4.5	1.5	2	3	3	4.5	0	9	9	4.5	45.5
0	4	6	1	1	4	3	16	1.5	0	0	13.5	0	0	0	3	0	4.5	3	3	0	28.5
0	2	0	1	5	4	4	30	4.5	0	0	4.5	0	0	0	1	4.5	0	3	3	0	20.5
0	0	5	2	2	25	8	30	4.5	0	0	0	0	0	3	1	4.5	0	3	3	1.5	20.5
0	4	5	4	4	3	6	4	4.5	0	0	0	0	0	3	3	0	0	1	1	0	12.5

# APPENDIX D: MAP OF MALUTI-A-PHOFUNG MUNICIPALITY (FS194)





# APPENDIX E

## Frequency Table

### HEAD

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	1	15	50.0	50.0	50.0
		2	15	50.0	50.0	100.0
	Total	30	100.0	100.0		
2	Valid	1	17	56.7	56.7	56.7
		2	13	43.3	43.3	100.0
	Total	30	100.0	100.0		

### GENHEAD

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	1	17	56.7	56.7	56.7
		2	13	43.3	43.3	100.0
	Total	30	100.0	100.0		
2	Valid	1	15	50.0	50.0	50.0
		2	15	50.0	50.0	100.0
	Total	30	100.0	100.0		

**AGEHEAD**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	33	1	3.3	3.3	3.3
		36	2	6.7	6.7	10.0
		37	2	6.7	6.7	16.7
		38	3	10.0	10.0	26.7
		40	2	6.7	6.7	33.3
		42	1	3.3	3.3	36.7
		43	1	3.3	3.3	40.0
		44	1	3.3	3.3	43.3
		46	2	6.7	6.7	50.0
		47	1	3.3	3.3	53.3
		48	4	13.3	13.3	66.7
		49	1	3.3	3.3	70.0
		50	1	3.3	3.3	73.3
		51	1	3.3	3.3	76.7
		52	1	3.3	3.3	80.0
		53	2	6.7	6.7	86.7
		54	1	3.3	3.3	90.0
		63	1	3.3	3.3	93.3
		66	1	3.3	3.3	96.7
		71	1	3.3	3.3	100.0
	Total		30	100.0	100.0	
2	Valid	30	1	3.3	3.3	3.3
		31	1	3.3	3.3	6.7
		35	2	6.7	6.7	13.3
		38	1	3.3	3.3	16.7
		40	1	3.3	3.3	20.0
		42	2	6.7	6.7	26.7
		43	1	3.3	3.3	30.0
		45	1	3.3	3.3	33.3
		48	1	3.3	3.3	36.7
		50	3	10.0	10.0	46.7
		52	2	6.7	6.7	53.3
		54	1	3.3	3.3	56.7
		56	1	3.3	3.3	60.0
		58	1	3.3	3.3	63.3
		59	1	3.3	3.3	66.7
		60	1	3.3	3.3	70.0
		61	1	3.3	3.3	73.3
		62	1	3.3	3.3	76.7
		64	1	3.3	3.3	80.0
		65	1	3.3	3.3	83.3
68	1	3.3	3.3	86.7		
72	3	10.0	10.0	96.7		
78	1	3.3	3.3	100.0		
	Total		30	100.0	100.0	

**EDUHEAD**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	1	3	10.0	10.0	10.0
		2	15	50.0	50.0	60.0
		3	12	40.0	40.0	100.0
		Total	30	100.0	100.0	
2	Valid	1	4	13.3	13.3	13.3
		2	16	53.3	53.3	66.7
		3	9	30.0	30.0	96.7
		4	1	3.3	3.3	100.0
		Total	30	100.0	100.0	

**OCCUHEAD**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	1	2	6.7	6.7	6.7
		2	1	3.3	3.3	10.0
		3	2	6.7	6.7	16.7
		4	1	3.3	3.3	20.0
		5	19	63.3	63.3	83.3
		6	4	13.3	13.3	96.7
		7	1	3.3	3.3	100.0
		Total	30	100.0	100.0	
2	Valid	2	1	3.3	3.3	3.3
		5	21	70.0	70.0	73.3
		6	7	23.3	23.3	96.7
		7	1	3.3	3.3	100.0
		Total	30	100.0	100.0	

**INCSAL**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	0	26	86.7	86.7	86.7
		1	4	13.3	13.3	100.0
		Total	30	100.0	100.0	
2	Valid	0	29	96.7	96.7	96.7
		1	1	3.3	3.3	100.0
		Total	30	100.0	100.0	

**INCPEN**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	0	17	56.7	56.7	56.7
		2	13	43.3	43.3	100.0
		Total	30	100.0	100.0	
2	Valid	0	13	43.3	43.3	43.3
		2	17	56.7	56.7	100.0
		Total	30	100.0	100.0	

**INCHILGR**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	0	13	43.3	43.3	43.3
		3	17	56.7	56.7	100.0
	Total	30	100.0	100.0		
2	Valid	0	17	56.7	56.7	56.7
		3	13	43.3	43.3	100.0
	Total	30	100.0	100.0		

**INCBUS**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	0	24	80.0	80.0	80.0
		4	6	20.0	20.0	100.0
	Total	30	100.0	100.0		
2	Valid	0	29	96.7	96.7	96.7
		4	1	3.3	3.3	100.0
	Total	30	100.0	100.0		

**INCAGRIC**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	0	26	86.7	86.7	86.7
		5	4	13.3	13.3	100.0
	Total	30	100.0	100.0		
2	Valid	0	30	100.0	100.0	100.0

**REMITT**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	0	27	90.0	90.0	90.0
		6	3	10.0	10.0	100.0
	Total	30	100.0	100.0		
2	Valid	0	29	96.7	96.7	96.7
		6	1	3.3	3.3	100.0
	Total	30	100.0	100.0		

TINCOME

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent	
1	Valid	30	1	3.3	3.3	3.3	
		100	2	6.7	6.7	10.0	
		150	1	3.3	3.3	13.3	
		170	3	10.0	10.0	23.3	
		220	1	3.3	3.3	26.7	
		300	1	3.3	3.3	30.0	
		340	2	6.7	6.7	36.7	
		420	1	3.3	3.3	40.0	
		670	1	3.3	3.3	43.3	
		740	6	20.0	20.0	63.3	
		910	2	6.7	6.7	70.0	
		970	1	3.3	3.3	73.3	
		1080	1	3.3	3.3	76.7	
		1099	1	3.3	3.3	80.0	
		1280	1	3.3	3.3	83.3	
		1310	1	3.3	3.3	86.7	
		1492	1	3.3	3.3	90.0	
		1650	1	3.3	3.3	93.3	
		2170	1	3.3	3.3	96.7	
		2500	1	3.3	3.3	100.0	
	Total	30	100.0	100.0			
2	Valid	150	1	3.3	3.3	3.3	
		170	6	20.0	20.0	23.3	
		340	3	10.0	10.0	33.3	
		410	1	3.3	3.3	36.7	
		470	1	3.3	3.3	40.0	
		500	1	3.3	3.3	43.3	
		530	1	3.3	3.3	46.7	
		740	10	33.3	33.3	80.0	
		1080	2	6.7	6.7	86.7	
		1140	1	3.3	3.3	90.0	
		1480	3	10.0	10.0	100.0	
			Total	30	100.0	100.0	

**HOUSENO**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	2	2	6.7	6.7	6.7
		3	3	10.0	10.0	16.7
		4	7	23.3	23.3	40.0
		5	6	20.0	20.0	60.0
		6	6	20.0	20.0	80.0
		7	2	6.7	6.7	86.7
		8	2	6.7	6.7	93.3
		9	1	3.3	3.3	96.7
		10	1	3.3	3.3	100.0
		Total	30	100.0	100.0	
		2	Valid	2	2	6.7
3	6			20.0	20.0	26.7
4	4			13.3	13.3	40.0
5	7			23.3	23.3	63.3
6	2			6.7	6.7	70.0
7	5			16.7	16.7	86.7
8	3			10.0	10.0	96.7
10	1			3.3	3.3	100.0
Total	30			100.0	100.0	

**MALENO**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	0	1	3.3	3.3	3.3
		1	9	30.0	30.0	33.3
		2	9	30.0	30.0	63.3
		3	9	30.0	30.0	93.3
		4	1	3.3	3.3	96.7
		6	1	3.3	3.3	100.0
		Total	30	100.0	100.0	
2	Valid	1	13	43.3	43.3	43.3
		2	3	10.0	10.0	53.3
		3	8	26.7	26.7	80.0
		4	6	20.0	20.0	100.0
		Total	30	100.0	100.0	

**FEMALENO**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	1	3	10.0	10.0	10.0
		2	9	30.0	30.0	40.0
		3	7	23.3	23.3	63.3
		4	7	23.3	23.3	86.7
		5	2	6.7	6.7	93.3
		6	2	6.7	6.7	100.0
		Total	30	100.0	100.0	
2	Valid	1	5	16.7	16.7	16.7
		2	9	30.0	30.0	46.7
		3	6	20.0	20.0	66.7
		4	7	23.3	23.3	90.0
		5	1	3.3	3.3	93.3
		6	1	3.3	3.3	96.7
		7	1	3.3	3.3	100.0
		Total	30	100.0	100.0	

**ADULTNO**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	1	3	10.0	10.0	10.0
		2	9	30.0	30.0	40.0
		3	12	40.0	40.0	80.0
		4	2	6.7	6.7	86.7
		5	2	6.7	6.7	93.3
		6	2	6.7	6.7	100.0
		Total	30	100.0	100.0	
2	Valid	1	6	20.0	20.0	20.0
		2	7	23.3	23.3	43.3
		3	6	20.0	20.0	63.3
		4	3	10.0	10.0	73.3
		5	7	23.3	23.3	96.7
		6	1	3.3	3.3	100.0
		Total	30	100.0	100.0	

**CHILDNO**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	0	7	23.3	23.3	23.3
		1	7	23.3	23.3	46.7
		2	9	30.0	30.0	76.7
		3	4	13.3	13.3	90.0
		4	3	10.0	10.0	100.0
	Total	30	100.0	100.0		
2	Valid	0	4	13.3	13.3	13.3
		1	13	43.3	43.3	56.7
		2	6	20.0	20.0	76.7
		3	5	16.7	16.7	93.3
		4	1	3.3	3.3	96.7
	5	1	3.3	3.3	100.0	
Total	30	100.0	100.0			

**YCHILDNO**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	0	15	50.0	50.0	50.0
		1	13	43.3	43.3	93.3
		2	2	6.7	6.7	100.0
	Total	30	100.0	100.0		
2	Valid	0	19	63.3	63.3	63.3
		1	8	26.7	26.7	90.0
		2	3	10.0	10.0	100.0
	Total	30	100.0	100.0		

**MIGRATED**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	0	28	93.3	93.3	93.3
		1	1	3.3	3.3	96.7
		2	1	3.3	3.3	100.0
	Total	30	100.0	100.0		
2	Valid	0	30	100.0	100.0	100.0

**LAND**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	1	1	3.3	3.3	3.3
		2	29	96.7	96.7	100.0
	Total	30	100.0	100.0		
2	Valid	1	4	13.3	13.3	13.3
		2	26	86.7	86.7	100.0
	Total	30	100.0	100.0		



**COW**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	1	1	3.3	3.3	3.3
		2	29	96.7	96.7	100.0
	Total	30	100.0	100.0		
2	Valid	1	4	13.3	13.3	13.3
		2	26	86.7	86.7	100.0
	Total	30	100.0	100.0		

**SHEEP**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	1	1	3.3	3.3	3.3
		2	29	96.7	96.7	100.0
	Total	30	100.0	100.0		
2	Valid	1	2	6.7	6.7	6.7
		2	28	93.3	93.3	100.0
	Total	30	100.0	100.0		

**CHICK**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	1	30	100.0	100.0	100.0
2	Valid	1	15	50.0	50.0	50.0
		2	15	50.0	50.0	100.0
	Total		30	100.0	100.0	

**GOAT**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	1	1	3.3	3.3	3.3
		2	29	96.7	96.7	100.0
	Total	30	100.0	100.0		
2	Valid	2	30	100.0	100.0	100.0

**HOUSE**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	1	29	96.7	96.7	96.7
		2	1	3.3	3.3	100.0
	Total	30	100.0	100.0		
2	Valid	1	28	93.3	93.3	93.3
		2	2	6.7	6.7	100.0
	Total	30	100.0	100.0		

TV

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	1	16	53.3	53.3	53.3
		2	14	46.7	46.7	100.0
		Total	30	100.0	100.0	
2	Valid	1	15	50.0	50.0	50.0
		2	15	50.0	50.0	100.0
		Total	30	100.0	100.0	

RADIO

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	1	26	86.7	86.7	86.7
		2	4	13.3	13.3	100.0
		Total	30	100.0	100.0	
2	Valid	1	23	76.7	76.7	76.7
		2	7	23.3	23.3	100.0
		Total	30	100.0	100.0	

JEWELRY

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	1	1	3.3	3.3	3.3
		2	29	96.7	96.7	100.0
		Total	30	100.0	100.0	
2	Valid	1	2	6.7	6.7	6.7
		2	28	93.3	93.3	100.0
		Total	30	100.0	100.0	

SCHOOL

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	0	4	13.3	13.3	13.3
		1	5	16.7	16.7	30.0
		2	8	26.7	26.7	56.7
		3	9	30.0	30.0	86.7
		4	4	13.3	13.3	100.0
		Total	30	100.0	100.0	
2	Valid	0	4	13.3	13.3	13.3
		1	7	23.3	23.3	36.7
		2	6	20.0	20.0	56.7
		3	9	30.0	30.0	86.7
		4	2	6.7	6.7	93.3
		5	2	6.7	6.7	100.0
Total	30	100.0	100.0			

EGGNO

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent	
1	Valid	0	4	13.3	13.3	13.3	
		1	1	3.3	3.3	16.7	
		2	1	3.3	3.3	20.0	
		4	1	3.3	3.3	23.3	
		8	1	3.3	3.3	26.7	
		12	1	3.3	3.3	30.0	
		32	1	3.3	3.3	33.3	
		36	1	3.3	3.3	36.7	
		40	2	6.7	6.7	43.3	
		48	5	16.7	16.7	60.0	
		56	3	10.0	10.0	70.0	
		60	1	3.3	3.3	73.3	
		64	1	3.3	3.3	76.7	
		72	1	3.3	3.3	80.0	
		80	1	3.3	3.3	83.3	
		96	2	6.7	6.7	90.0	
		120	1	3.3	3.3	93.3	
		144	2	6.7	6.7	100.0	
			Total	30	100.0	100.0	
2	Valid	0	2	6.7	6.7	6.7	
		6	2	6.7	6.7	13.3	
		8	1	3.3	3.3	16.7	
		18	1	3.3	3.3	20.0	
		20	1	3.3	3.3	23.3	
		24	3	10.0	10.0	33.3	
		30	6	20.0	20.0	53.3	
		32	2	6.7	6.7	60.0	
		40	1	3.3	3.3	63.3	
		48	3	10.0	10.0	73.3	
		60	7	23.3	23.3	96.7	
		64	1	3.3	3.3	100.0	
			Total	30	100.0	100.0	

**CHICKEN**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	0	2	6.7	6.7	6.7
		1	3	10.0	10.0	16.7
		2	4	13.3	13.3	30.0
		3	2	6.7	6.7	36.7
		4	12	40.0	40.0	76.7
		8	2	6.7	6.7	83.3
		12	5	16.7	16.7	100.0
		Total	30	100.0	100.0	
2	Valid	0	1	3.3	3.3	3.3
		1	7	23.3	23.3	26.7
		2	5	16.7	16.7	43.3
		3	1	3.3	3.3	46.7
		4	12	40.0	40.0	86.7
		8	3	10.0	10.0	96.7
		12	1	3.3	3.3	100.0
		Total	30	100.0	100.0	

**BEEF**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	0	20	66.7	66.7	66.7
		1	9	30.0	30.0	96.7
		4	1	3.3	3.3	100.0
		Total	30	100.0	100.0	
2	Valid	0	21	70.0	70.0	70.0
		1	4	13.3	13.3	83.3
		2	2	6.7	6.7	90.0
		3	2	6.7	6.7	96.7
		4	1	3.3	3.3	100.0
		Total	30	100.0	100.0	

**MUTTON**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	0	22	73.3	73.3	73.3
		1	7	23.3	23.3	96.7
		3	1	3.3	3.3	100.0
		Total	30	100.0	100.0	
2	Valid	0	21	70.0	70.0	70.0
		1	6	20.0	20.0	90.0
		2	1	3.3	3.3	93.3
		3	2	6.7	6.7	100.0
		Total	30	100.0	100.0	

**PORK**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	0	26	86.7	86.7	86.7
		1	4	13.3	13.3	100.0
		Total	30	100.0	100.0	
2	Valid	0	27	90.0	90.0	90.0
		1	1	3.3	3.3	93.3
		3	2	6.7	6.7	100.0
		Total	30	100.0	100.0	

**PROCMEAT**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	0	10	33.3	33.3	33.3
		1	7	23.3	23.3	56.7
		2	7	23.3	23.3	80.0
		3	2	6.7	6.7	86.7
		4	1	3.3	3.3	90.0
		8	1	3.3	3.3	93.3
		14	1	3.3	3.3	96.7
		16	1	3.3	3.3	100.0
		Total	30	100.0	100.0	
		2	Valid	0	11	36.7
1	5			16.7	16.7	53.3
2	6			20.0	20.0	73.3
3	4			13.3	13.3	86.7
4	4			13.3	13.3	100.0
Total	30			100.0	100.0	

**FISH**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	0	18	60.0	60.0	60.0
		1	6	20.0	20.0	80.0
		2	3	10.0	10.0	90.0
		3	2	6.7	6.7	96.7
		8	1	3.3	3.3	100.0
		Total	30	100.0	100.0	
2	Valid	0	14	46.7	46.7	46.7
		1	4	13.3	13.3	60.0
		2	1	3.3	3.3	63.3
		3	3	10.0	10.0	73.3
		5	2	6.7	6.7	80.0
		6	3	10.0	10.0	90.0
		8	3	10.0	10.0	100.0
		Total	30	100.0	100.0	

**BEETROOT**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	0	3	10.0	10.0	10.0
		1	5	16.7	16.7	26.7
		2	2	6.7	6.7	33.3
		3	1	3.3	3.3	36.7
		4	9	30.0	30.0	66.7
		8	4	13.3	13.3	80.0
		12	5	16.7	16.7	96.7
		20	1	3.3	3.3	100.0
		Total	30	100.0	100.0	
2	Valid	0	5	16.7	16.7	16.7
		1	5	16.7	16.7	33.3
		2	3	10.0	10.0	43.3
		4	11	36.7	36.7	80.0
		8	3	10.0	10.0	90.0
		12	3	10.0	10.0	100.0
		Total	30	100.0	100.0	

**CARROT**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	0	1	3.3	3.3	3.3
		1	4	13.3	13.3	16.7
		2	1	3.3	3.3	20.0
		4	8	26.7	26.7	46.7
		6	1	3.3	3.3	50.0
		8	5	16.7	16.7	66.7
		12	7	23.3	23.3	90.0
		20	2	6.7	6.7	96.7
		25	1	3.3	3.3	100.0
		Total	30	100.0	100.0	
2	Valid	0	3	10.0	10.0	10.0
		1	7	23.3	23.3	33.3
		2	3	10.0	10.0	43.3
		4	10	33.3	33.3	76.7
		5	1	3.3	3.3	80.0
		8	2	6.7	6.7	86.7
		12	2	6.7	6.7	93.3
		16	1	3.3	3.3	96.7
		28	1	3.3	3.3	100.0
		Total	30	100.0	100.0	

### CABBAGE

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	0	3	10.0	10.0	10.0
		1	1	3.3	3.3	13.3
		2	1	3.3	3.3	16.7
		4	1	3.3	3.3	20.0
		8	4	13.3	13.3	33.3
		12	7	23.3	23.3	56.7
		16	6	20.0	20.0	76.7
		20	4	13.3	13.3	90.0
		24	2	6.7	6.7	96.7
		28	1	3.3	3.3	100.0
		Total	30	100.0	100.0	
		2	Valid	0	2	6.7
3	2			6.7	6.7	13.3
4	3			10.0	10.0	23.3
8	3			10.0	10.0	33.3
12	4			13.3	13.3	46.7
16	2			6.7	6.7	53.3
20	1			3.3	3.3	56.7
24	3			10.0	10.0	66.7
25	1			3.3	3.3	70.0
28	6			20.0	20.0	90.0
30	1			3.3	3.3	93.3
31	2			6.7	6.7	100.0
Total	30			100.0	100.0	

ONION

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	0	1	3.3	3.3	3.3
		3	2	6.7	6.7	10.0
		8	2	6.7	6.7	16.7
		12	5	16.7	16.7	33.3
		16	3	10.0	10.0	43.3
		20	5	16.7	16.7	60.0
		24	3	10.0	10.0	70.0
		25	1	3.3	3.3	73.3
		28	5	16.7	16.7	90.0
		31	3	10.0	10.0	100.0
		Total	30	100.0	100.0	
		2	Valid	0	2	6.7
3	1			3.3	3.3	10.0
4	1			3.3	3.3	13.3
6	2			6.7	6.7	20.0
7	1			3.3	3.3	23.3
8	2			6.7	6.7	30.0
12	3			10.0	10.0	40.0
21	1			3.3	3.3	43.3
24	2			6.7	6.7	50.0
28	11			36.7	36.7	86.7
30	1			3.3	3.3	90.0
31	3			10.0	10.0	100.0
Total	30			100.0	100.0	



**SPINACH**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	3	1	3.3	3.3	3.3
		7	1	3.3	3.3	6.7
		8	1	3.3	3.3	10.0
		12	7	23.3	23.3	33.3
		16	6	20.0	20.0	53.3
		20	5	16.7	16.7	70.0
		21	1	3.3	3.3	73.3
		24	3	10.0	10.0	83.3
		28	3	10.0	10.0	93.3
		31	2	6.7	6.7	100.0
		Total	30	100.0	100.0	
2	Valid	4	2	6.7	6.7	6.7
		6	1	3.3	3.3	10.0
		12	3	10.0	10.0	20.0
		16	4	13.3	13.3	33.3
		20	1	3.3	3.3	36.7
		24	1	3.3	3.3	40.0
		25	1	3.3	3.3	43.3
		28	8	26.7	26.7	70.0
		30	4	13.3	13.3	83.3
		31	5	16.7	16.7	100.0
		Total	30	100.0	100.0	

**PREFERE**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	.0	7	23.3	23.3	23.3
		.5	6	20.0	20.0	43.3
		1.5	8	26.7	26.7	70.0
		4.5	9	30.0	30.0	100.0
		Total	30	100.0	100.0	
2	Valid	.0	1	3.3	3.3	3.3
		1.5	12	40.0	40.0	43.3
		4.5	17	56.7	56.7	100.0
		Total	30	100.0	100.0	

**ALCOHOL**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	0	30	100.0	100.0	100.0
2	Valid	0	30	100.0	100.0	100.0

**DUSTBIN**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	0	30	100.0	100.0	100.0
2	Valid	0	28	93.3	93.3	93.3
		2	1	3.3	3.3	96.7
		6	1	3.3	3.3	100.0
		Total	30	100.0	100.0	

**BORROW**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	0	9	30.0	30.0	30.0
		2	3	10.0	10.0	40.0
		5	11	36.7	36.7	76.7
		14	6	20.0	20.0	96.7
		21	1	3.3	3.3	100.0
		Total	30	100.0	100.0	
2	Valid	0	7	23.3	23.3	23.3
		2	2	6.7	6.7	30.0
		5	10	33.3	33.3	63.3
		14	11	36.7	36.7	100.0
		Total	30	100.0	100.0	

**WILD**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	0	30	100.0	100.0	100.0
2	Valid	0	28	93.3	93.3	93.3
		2	2	6.7	6.7	100.0
		Total	30	100.0	100.0	

**BEG**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	0	29	96.7	96.7	96.7
		6	1	3.3	3.3	100.0
		Total	30	100.0	100.0	
2	Valid	0	26	86.7	86.7	86.7
		2	3	10.0	10.0	96.7
		6	1	3.3	3.3	100.0
		Total	30	100.0	100.0	

**CREDIT**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	0	16	53.3	53.3	53.3
		1	9	30.0	30.0	83.3
		3	4	13.3	13.3	96.7
		9	1	3.3	3.3	100.0
		Total	30	100.0	100.0	
2	Valid	0	12	40.0	40.0	40.0
		1	6	20.0	20.0	60.0
		3	10	33.3	33.3	93.3
		9	2	6.7	6.7	100.0
		Total	30	100.0	100.0	

**FRIEND**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	0	17	56.7	56.7	56.7
		1	5	16.7	16.7	73.3
		3	8	26.7	26.7	100.0
		Total	30	100.0	100.0	
2	Valid	0	14	46.7	46.7	46.7
		1	5	16.7	16.7	63.3
		3	10	33.3	33.3	96.7
		5	1	3.3	3.3	100.0
		Total	30	100.0	100.0	

**SENDCHIL**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	0	16	53.3	53.3	53.3
		2	3	10.0	10.0	63.3
		5	9	30.0	30.0	93.3
		14	2	6.7	6.7	100.0
		Total	30	100.0	100.0	
2	Valid	0	13	43.3	43.3	43.3
		2	3	10.0	10.0	53.3
		5	11	36.7	36.7	90.0
		14	3	10.0	10.0	100.0
		Total	30	100.0	100.0	

**CEREMONY**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	0	30	100.0	100.0	100.0
2	Valid	0	25	83.3	83.3	83.3
		2	3	10.0	10.0	93.3
		5	2	6.7	6.7	100.0
		Total	30	100.0	100.0	

**MEALSIZE**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	0	1	3.3	3.3	3.3
		1	6	20.0	20.0	23.3
		3	20	66.7	66.7	90.0
		9	3	10.0	10.0	100.0
		Total	30	100.0	100.0	
2	Valid	0	2	6.7	6.7	6.7
		1	5	16.7	16.7	23.3
		3	13	43.3	43.3	66.7
		9	9	30.0	30.0	96.7
		14	1	3.3	3.3	100.0
		Total	30	100.0	100.0	

**RESTCON**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	0	9	30.0	30.0	30.0
		1	5	16.7	16.7	46.7
		3	13	43.3	43.3	90.0
		9	3	10.0	10.0	100.0
		Total	30	100.0	100.0	
2	Valid	0	5	16.7	16.7	16.7
		1	4	13.3	13.3	30.0
		3	12	40.0	40.0	70.0
		5	1	3.3	3.3	73.3
		9	7	23.3	23.3	96.7
		14	1	3.3	3.3	100.0
		Total	30	100.0	100.0	

**SKIPMEAL**

FSPACK			Frequency	Percent	Valid Percent	Cumulative Percent
1	Valid	0	23	76.7	76.7	76.7
		2	2	6.7	6.7	83.3
		5	5	16.7	16.7	100.0
		Total	30	100.0	100.0	
2	Valid	0	22	73.3	73.3	73.3
		2	3	10.0	10.0	83.3
		5	4	13.3	13.3	96.7
		14	1	3.3	3.3	100.0
		Total	30	100.0	100.0	

CSI

FSPACK		Frequency	Percent	Valid Percent	Cumulative Percent	
1	Valid	1.0	3	10.0	10.0	10.0
		2.5	2	6.7	6.7	16.7
		6.0	1	3.3	3.3	20.0
		6.5	1	3.3	3.3	23.3
		7.5	1	3.3	3.3	26.7
		8.5	1	3.3	3.3	30.0
		9.0	2	6.7	6.7	36.7
		10.0	1	3.3	3.3	40.0
		13.5	1	3.3	3.3	43.3
		14.0	1	3.3	3.3	46.7
		17.5	1	3.3	3.3	50.0
		18.0	2	6.7	6.7	56.7
		19.5	2	6.7	6.7	63.3
		22.0	1	3.3	3.3	66.7
		23.5	1	3.3	3.3	70.0
		24.0	1	3.3	3.3	73.3
		27.0	2	6.7	6.7	80.0
		31.5	1	3.3	3.3	83.3
		32.5	1	3.3	3.3	86.7
		35.5	1	3.3	3.3	90.0
42.0	1	3.3	3.3	93.3		
43.0	1	3.3	3.3	96.7		
45.5	1	3.3	3.3	100.0		
	Total	30	100.0	100.0		
2	Valid	.0	1	3.3	3.3	3.3
		2.1	1	3.3	3.3	6.7
		5.5	1	3.3	3.3	10.0
		11.5	2	6.7	6.7	16.7
		12.0	1	3.3	3.3	20.0
		12.5	2	6.7	6.7	26.7
		13.5	1	3.3	3.3	30.0
		16.0	1	3.3	3.3	33.3
		20.5	3	10.0	10.0	43.3
		22.5	3	10.0	10.0	53.3
		28.0	1	3.3	3.3	56.7
		28.5	1	3.3	3.3	60.0
		31.0	1	3.3	3.3	63.3
		31.5	1	3.3	3.3	66.7
		32.5	1	3.3	3.3	70.0
		37.5	1	3.3	3.3	73.3
		40.5	1	3.3	3.3	76.7
		41.5	1	3.3	3.3	80.0
		42.0	2	6.7	6.7	86.7
		45.0	1	3.3	3.3	90.0
45.5	1	3.3	3.3	93.3		
46.5	1	3.3	3.3	96.7		
75.5	1	3.3	3.3	100.0		
	Total	30	100.0	100.0		

# APPENDIX F

## T-Test

### Group Statistics

	FSPACK	N	Mean	Std. Deviation	Std. Error Mean
HEAD	1	30	1.50	.509	.093
	2	30	1.43	.504	.092
GENHEAD	1	30	1.43	.504	.092
	2	30	1.50	.509	.093
AGEHEAD	1	30	46.50	9.089	1.659
	2	30	52.80	13.100	2.392
EDUHEAD	1	30	2.30	.651	.119
	2	30	2.23	.728	.133
OCCUHEAD	1	30	4.67	1.373	.251
	2	30	5.20	.805	.147
INCSAL	1	30	.13	.346	.063
	2	30	.03	.183	.033
INCPEN	1	30	.87	1.008	.184
	2	30	1.13	1.008	.184
INCHILGR	1	30	1.70	1.512	.276
	2	30	1.30	1.512	.276
INCBUS	1	30	.80	1.627	.297
	2	30	.13	.730	.133
INCAGRIC	1	30	.67	1.729	.316
	2	30	.00	.000	.000
REMITT	1	30	.60	1.831	.334
	2	30	.20	1.095	.200
TINCOME	1	30	766.37	616.562	112.568
	2	30	641.33	406.963	74.301
HOUSENO	1	30	5.20	1.937	.354
	2	30	5.13	2.030	.371
MALENO	1	30	2.13	1.196	.218
	2	30	2.23	1.223	.223
FEMALENO	1	30	3.07	1.363	.249
	2	30	2.90	1.494	.273
ADULTNO	1	30	2.90	1.296	.237
	2	30	3.03	1.564	.286
CHILDNO	1	30	1.63	1.273	.232
	2	30	1.63	1.217	.222
YCHILDNO	1	30	.57	.626	.114
	2	30	.47	.681	.124
MIGRATED	1	30	.10	.403	.074
	2	30	.00	.000	.000
LAND	1	30	1.97	.183	.033
	2	30	1.87	.346	.063
COW	1	30	1.97	.183	.033
	2	30	1.87	.346	.063
SHEEP	1	30	1.97	.183	.033
	2	30	1.93	.254	.046
CHICK	1	30	1.00	.000	.000
	2	30	1.50	.509	.093

**Group Statistics**

	FSPACK	N	Mean	Std. Deviation	Std. Error Mean
GOAT	1	30	1.97	.183	.033
	2	30	2.00	.000	.000
HOUSE	1	30	1.03	.183	.033
	2	30	1.07	.254	.046
TV	1	30	1.47	.507	.093
	2	30	1.50	.509	.093
RADIO	1	30	1.13	.346	.063
	2	30	1.23	.430	.079
JEWELRY	1	30	1.97	.183	.033
	2	30	1.93	.254	.046
SCHOOL	1	30	2.13	1.252	.229
	2	30	2.13	1.408	.257
EGGNO	1	30	48.63	41.233	7.528
	2	30	34.73	20.045	3.660
CHICKEN	1	30	4.70	3.780	.690
	2	30	3.47	2.649	.484
BEEF	1	30	.43	.817	.149
	2	30	.60	1.102	.201
MUTTON	1	30	.33	.661	.121
	2	30	.47	.860	.157
PORK	1	30	.13	.346	.063
	2	30	.23	.774	.141
PROCMEAT	1	30	2.30	3.834	.700
	2	30	1.50	1.456	.266
FISH	1	30	.87	1.634	.298
	2	30	2.23	2.849	.520
BEETROOT	1	30	5.33	4.873	.890
	2	30	3.83	3.602	.658
CARROT	1	30	7.77	6.202	1.132
	2	30	4.73	5.836	1.066
CABBAGE	1	30	12.50	7.587	1.385
	2	30	16.63	10.708	1.955
ONION	1	30	18.67	8.976	1.639
	2	30	19.27	11.095	2.026
SPINACH	1	30	17.90	7.184	1.312
	2	30	22.73	8.902	1.625
PREFERE	1	30	1.850	1.8483	.3375
	2	30	3.150	1.5928	.2908
ALCOHOL	1	30	.00	.000 <sup>a</sup>	.000
	2	30	.00	.000 <sup>a</sup>	.000
DUSTBIN	1	30	.00	.000	.000
	2	30	.27	1.143	.209
BORROW	1	30	5.20	5.732	1.047
	2	30	6.55	5.647	1.031
WILD	1	30	.00	.000	.000
	2	30	.10	.381	.069
BEG	1	30	.20	1.095	.200
	2	30	.40	1.221	.223

**Group Statistics**

	FSPACK	N	Mean	Std. Deviation	Std. Error Mean
CREDIT	1	30	1.00	1.819	.332
	2	30	1.80	2.355	.430
FRIEND	1	30	.97	1.299	.237
	2	30	1.32	1.477	.270
SENDCHIL	1	30	2.40	3.623	.662
	2	30	3.15	4.062	.742
CEREMONY	1	30	.00	.000	.000
	2	30	.45	1.192	.218
MEALSIZE	1	30	3.10	2.203	.402
	2	30	4.63	3.728	.681
RESTCON	1	30	2.37	2.606	.476
	2	30	4.05	3.729	.681
SKIPMEAL	1	30	.85	1.703	.311
	2	30	1.20	2.797	.511
CSI	1	30	17.933	13.1193	2.3952
	2	30	26.452	16.4450	3.0024

a. t cannot be computed because the standard deviations of both groups are 0.



**Independent Samples Test**

		Levene's Test for Equality of Variances	
		F	Sig.
HEAD	Equal variances assumed Equal variances not assumed	.525	.472
GENHEAD	Equal variances assumed Equal variances not assumed	.525	.472
AGEHEAD	Equal variances assumed Equal variances not assumed	5.357	.024
EDUHEAD	Equal variances assumed Equal variances not assumed	.033	.856
OCCUHEAD	Equal variances assumed Equal variances not assumed	4.207	.045
INCSAL	Equal variances assumed Equal variances not assumed	8.930	.004
INCPEN	Equal variances assumed Equal variances not assumed	.000	1.000
INCHILGR	Equal variances assumed Equal variances not assumed	.000	1.000
INCBUS	Equal variances assumed Equal variances not assumed	22.108	.000
INCAGRIC	Equal variances assumed Equal variances not assumed	24.926	.000
REMITT	Equal variances assumed Equal variances not assumed	4.520	.038
TINCOME	Equal variances assumed Equal variances not assumed	2.640	.110

**Independent Samples Test**

		Levene's Test for Equality of Variances	
		F	Sig.
HOUSENO	Equal variances assumed Equal variances not assumed	.181	.672
MALENO	Equal variances assumed Equal variances not assumed	1.716	.195
FEMALENO	Equal variances assumed Equal variances not assumed	.164	.687
ADULTNO	Equal variances assumed Equal variances not assumed	3.068	.085
CHILDNO	Equal variances assumed Equal variances not assumed	.171	.680
YCHILDNO	Equal variances assumed Equal variances not assumed	.110	.741
MIGRATED	Equal variances assumed Equal variances not assumed	8.295	.006
LAND	Equal variances assumed Equal variances not assumed	8.930	.004
COW	Equal variances assumed Equal variances not assumed	8.930	.004
SHEEP	Equal variances assumed Equal variances not assumed	1.396	.242
CHICK	Equal variances assumed Equal variances not assumed		
GOAT	Equal variances assumed Equal variances not assumed	4.291	.043

Independent Samples Test

		Levene's Test for Equality of Variances	
		F	Sig.
HOUSE	Equal variances assumed Equal variances not assumed	1.396	.242
TV	Equal variances assumed Equal variances not assumed	.129	.720
RADIO	Equal variances assumed Equal variances not assumed	4.117	.047
JEWELRY	Equal variances assumed Equal variances not assumed	1.396	.242
SCHOOL	Equal variances assumed Equal variances not assumed	.482	.490
EGGNO	Equal variances assumed Equal variances not assumed	6.969	.011
CHICKEN	Equal variances assumed Equal variances not assumed	3.137	.082
BEEF	Equal variances assumed Equal variances not assumed	2.558	.115
MUTTON	Equal variances assumed Equal variances not assumed	1.662	.202
PORK	Equal variances assumed Equal variances not assumed	2.227	.141
PROCMEAT	Equal variances assumed Equal variances not assumed	3.149	.081
FISH	Equal variances assumed Equal variances not assumed	16.231	.000

Independent Samples Test

		Levene's Test for Equality of Variances	
		F	Sig.
BEETROOT	Equal variances assumed Equal variances not assumed	3.757	.057
CARROT	Equal variances assumed Equal variances not assumed	1.085	.302
CABBAGE	Equal variances assumed Equal variances not assumed	9.979	.003
ONION	Equal variances assumed Equal variances not assumed	5.857	.019
SPINACH	Equal variances assumed Equal variances not assumed	3.095	.084
PREFERE	Equal variances assumed Equal variances not assumed	.118	.733
DUSTBIN	Equal variances assumed Equal variances not assumed	7.083	.010
BORROW	Equal variances assumed Equal variances not assumed	.868	.355
WILD	Equal variances assumed Equal variances not assumed	9.609	.003
BEG	Equal variances assumed Equal variances not assumed	1.385	.244
CREDIT	Equal variances assumed Equal variances not assumed	3.224	.078
FRIEND	Equal variances assumed Equal variances not assumed	2.180	.145

**Independent Samples Test**

		Levene's Test for Equality of Variances	
		F	Sig.
SENDCHIL	Equal variances assumed Equal variances not assumed	.252	.617
CEREMONY	Equal variances assumed Equal variances not assumed	20.139	.000
MEALSIZE	Equal variances assumed Equal variances not assumed	19.924	.000
RESTCON	Equal variances assumed Equal variances not assumed	4.940	.030
SKIPMEAL	Equal variances assumed Equal variances not assumed	1.087	.302
CSI	Equal variances assumed Equal variances not assumed	1.289	.261

**Independent Samples Test**

		t-test for Equality of Means			
		t	df	Sig. (2-tailed)	Mean Difference
HEAD	Equal variances assumed	.510	58	.612	.07
	Equal variances not assumed	.510	57.995	.612	.07
GENHEAD	Equal variances assumed	-.510	58	.612	-.07
	Equal variances not assumed	-.510	57.995	.612	-.07
AGEHEAD	Equal variances assumed	-2.164	58	.035	-6.30
	Equal variances not assumed	-2.164	51.666	.035	-6.30
EDUHEAD	Equal variances assumed	.374	58	.710	.07
	Equal variances not assumed	.374	57.296	.710	.07
OCCUHEAD	Equal variances assumed	-1.835	58	.072	-.53
	Equal variances not assumed	-1.835	46.837	.073	-.53
INCSAL	Equal variances assumed	1.401	58	.167	.10
	Equal variances not assumed	1.401	44.006	.168	.10
INCPEN	Equal variances assumed	-1.025	58	.310	-.27
	Equal variances not assumed	-1.025	58.000	.310	-.27
INCHILGR	Equal variances assumed	1.025	58	.310	.40
	Equal variances not assumed	1.025	58.000	.310	.40
INCBUS	Equal variances assumed	2.047	58	.045	.67
	Equal variances not assumed	2.047	40.225	.047	.67
INCAGRIC	Equal variances assumed	2.112	58	.039	.67
	Equal variances not assumed	2.112	29.000	.043	.67
REMITT	Equal variances assumed	1.027	58	.309	.40
	Equal variances not assumed	1.027	47.406	.310	.40
TINCOME	Equal variances assumed	.927	58	.358	125.03
	Equal variances not assumed	.927	50.238	.358	125.03

Independent Samples Test

		t-test for Equality of Means			
		t	df	Sig. (2-tailed)	Mean Difference
HOUSENO	Equal variances assumed	.130	58	.897	.07
	Equal variances not assumed	.130	57.874	.897	.07
MALENO	Equal variances assumed	-.320	58	.750	-.10
	Equal variances not assumed	-.320	57.971	.750	-.10
FEMALENO	Equal variances assumed	.451	58	.653	.17
	Equal variances not assumed	.451	57.520	.653	.17
ADULTNO	Equal variances assumed	-.360	58	.721	-.13
	Equal variances not assumed	-.360	56.059	.721	-.13
CHILDNO	Equal variances assumed	.000	58	1.000	.00
	Equal variances not assumed	.000	57.885	1.000	.00
YCHILDNO	Equal variances assumed	.592	58	.556	.10
	Equal variances not assumed	.592	57.588	.556	.10
MIGRATED	Equal variances assumed	1.361	58	.179	.10
	Equal variances not assumed	1.361	29.000	.184	.10
LAND	Equal variances assumed	1.401	58	.167	.10
	Equal variances not assumed	1.401	44.006	.168	.10
COW	Equal variances assumed	1.401	58	.167	.10
	Equal variances not assumed	1.401	44.006	.168	.10
SHEEP	Equal variances assumed	.584	58	.561	.03
	Equal variances not assumed	.584	52.684	.562	.03
CHICK	Equal variances assumed	-5.385	58	.000	-.50
	Equal variances not assumed	-5.385	29.000	.000	-.50
GOAT	Equal variances assumed	-1.000	58	.321	-.03
	Equal variances not assumed	-1.000	29.000	.326	-.03

**Independent Samples Test**

		t-test for Equality of Means			
		t	df	Sig. (2-tailed)	Mean Difference
HOUSE	Equal variances assumed	-.584	58	.561	-.03
	Equal variances not assumed	-.584	52.684	.562	-.03
TV	Equal variances assumed	-.254	58	.800	-.03
	Equal variances not assumed	-.254	58.000	.800	-.03
RADIO	Equal variances assumed	-.992	58	.325	-.10
	Equal variances not assumed	-.992	55.435	.325	-.10
JEWELRY	Equal variances assumed	.584	58	.561	.03
	Equal variances not assumed	.584	52.684	.562	.03
SCHOOL	Equal variances assumed	.000	58	1.000	.00
	Equal variances not assumed	.000	57.222	1.000	.00
EGGNO	Equal variances assumed	1.661	58	.102	13.90
	Equal variances not assumed	1.661	41.982	.104	13.90
CHICKEN	Equal variances assumed	1.464	58	.149	1.23
	Equal variances not assumed	1.464	51.949	.149	1.23
BEEF	Equal variances assumed	-.665	58	.508	-.17
	Equal variances not assumed	-.665	53.496	.509	-.17
MUTTON	Equal variances assumed	-.673	58	.504	-.13
	Equal variances not assumed	-.673	54.385	.504	-.13
PORK	Equal variances assumed	-.646	58	.521	-.10
	Equal variances not assumed	-.646	40.134	.522	-.10
PROCMEAT	Equal variances assumed	1.068	58	.290	.80
	Equal variances not assumed	1.068	37.197	.292	.80
FISH	Equal variances assumed	-2.279	58	.026	-1.37
	Equal variances not assumed	-2.279	46.224	.027	-1.37



**Independent Samples Test**

		t-test for Equality of Means			
		t	df	Sig. (2-tailed)	Mean Difference
BEETROOT	Equal variances assumed	1.356	58	.180	1.50
	Equal variances not assumed	1.356	53.401	.181	1.50
CARROT	Equal variances assumed	1.951	58	.056	3.03
	Equal variances not assumed	1.951	57.788	.056	3.03
CABBAGE	Equal variances assumed	-1.725	58	.090	-4.13
	Equal variances not assumed	-1.725	52.259	.090	-4.13
ONION	Equal variances assumed	-.230	58	.819	-.60
	Equal variances not assumed	-.230	55.577	.819	-.60
SPINACH	Equal variances assumed	-2.314	58	.024	-4.83
	Equal variances not assumed	-2.314	55.525	.024	-4.83
PREFERE	Equal variances assumed	-2.918	58	.005	-1.300
	Equal variances not assumed	-2.918	56.762	.005	-1.300
DUSTBIN	Equal variances assumed	-1.278	58	.206	-.27
	Equal variances not assumed	-1.278	29.000	.211	-.27
BORROW	Equal variances assumed	-.919	58	.362	-1.35
	Equal variances not assumed	-.919	57.987	.362	-1.35
WILD	Equal variances assumed	-1.439	58	.155	-.10
	Equal variances not assumed	-1.439	29.000	.161	-.10
BEG	Equal variances assumed	-.668	58	.507	-.20
	Equal variances not assumed	-.668	57.335	.507	-.20
CREDIT	Equal variances assumed	-1.472	58	.146	-.80
	Equal variances not assumed	-1.472	54.528	.147	-.80
FRIEND	Equal variances assumed	-.975	58	.334	-.35
	Equal variances not assumed	-.975	57.076	.334	-.35

Independent Samples Test

		t-test for Equality of Means			
		t	df	Sig. (2-tailed)	Mean Difference
SENDCHIL	Equal variances assumed	-.755	58	.454	-.75
	Equal variances not assumed	-.755	57.257	.454	-.75
CEREMONY	Equal variances assumed	-2.068	58	.043	-.45
	Equal variances not assumed	-2.068	29.000	.048	-.45
MEALSIZE	Equal variances assumed	-1.940	58	.057	-1.53
	Equal variances not assumed	-1.940	47.051	.058	-1.53
RESTCON	Equal variances assumed	-2.027	58	.047	-1.68
	Equal variances not assumed	-2.027	51.876	.048	-1.68
SKIPMEAL	Equal variances assumed	-.586	58	.560	-.35
	Equal variances not assumed	-.586	47.903	.561	-.35
CSI	Equal variances assumed	-2.218	58	.030	-8.518
	Equal variances not assumed	-2.218	55.272	.031	-8.518

**Independent Samples Test**

		t-test for Equality of Means		
		Std. Error Difference	95% Confidence Interval of the Difference	
			Lower	Upper
HEAD	Equal variances assumed	.131	-.195	.328
	Equal variances not assumed	.131	-.195	.328
GENHEAD	Equal variances assumed	.131	-.328	.195
	Equal variances not assumed	.131	-.328	.195
AGEHEAD	Equal variances assumed	2.911	-12.127	-.473
	Equal variances not assumed	2.911	-12.142	-.458
EDUHEAD	Equal variances assumed	.178	-.290	.424
	Equal variances not assumed	.178	-.290	.424
OCCUHEAD	Equal variances assumed	.291	-1.115	.048
	Equal variances not assumed	.291	-1.118	.051
INCSAL	Equal variances assumed	.071	-.043	.243
	Equal variances not assumed	.071	-.044	.244
INCPEN	Equal variances assumed	.260	-.788	.254
	Equal variances not assumed	.260	-.788	.254
INCHILGR	Equal variances assumed	.390	-.381	1.181
	Equal variances not assumed	.390	-.381	1.181
INCBUS	Equal variances assumed	.326	.015	1.319
	Equal variances not assumed	.326	.009	1.325
INCAGRIC	Equal variances assumed	.316	.035	1.298
	Equal variances not assumed	.316	.021	1.312
REMITT	Equal variances assumed	.390	-.380	1.180
	Equal variances not assumed	.390	-.383	1.183
TINCOME	Equal variances assumed	134.879	-144.956	395.022
	Equal variances not assumed	134.879	-145.847	395.913

**Independent Samples Test**

		t-test for Equality of Means		
		Std. Error Difference	95% Confidence Interval of the Difference	
			Lower	Upper
HOUSENO	Equal variances assumed	.512	-.959	1.092
	Equal variances not assumed	.512	-.959	1.092
MALENO	Equal variances assumed	.312	-.725	.525
	Equal variances not assumed	.312	-.725	.525
FEMALENO	Equal variances assumed	.369	-.572	.906
	Equal variances not assumed	.369	-.572	.906
ADULTNO	Equal variances assumed	.371	-.876	.609
	Equal variances not assumed	.371	-.876	.610
CHILDNO	Equal variances assumed	.322	-.644	.644
	Equal variances not assumed	.322	-.644	.644
YCHILDNO	Equal variances assumed	.169	-.238	.438
	Equal variances not assumed	.169	-.238	.438
MIGRATED	Equal variances assumed	.074	-.047	.247
	Equal variances not assumed	.074	-.050	.250
LAND	Equal variances assumed	.071	-.043	.243
	Equal variances not assumed	.071	-.044	.244
COW	Equal variances assumed	.071	-.043	.243
	Equal variances not assumed	.071	-.044	.244
SHEEP	Equal variances assumed	.057	-.081	.148
	Equal variances not assumed	.057	-.081	.148
CHICK	Equal variances assumed	.093	-.686	-.314
	Equal variances not assumed	.093	-.690	-.310
GOAT	Equal variances assumed	.033	-.100	.033
	Equal variances not assumed	.033	-.102	.035

### Independent Samples Test

		t-test for Equality of Means		
		Std. Error Difference	95% Confidence Interval of the Difference	
			Lower	Upper
HOUSE	Equal variances assumed	.057	-.148	.081
	Equal variances not assumed	.057	-.148	.081
TV	Equal variances assumed	.131	-.296	.229
	Equal variances not assumed	.131	-.296	.229
RADIO	Equal variances assumed	.101	-.302	.102
	Equal variances not assumed	.101	-.302	.102
JEWELRY	Equal variances assumed	.057	-.081	.148
	Equal variances not assumed	.057	-.081	.148
SCHOOL	Equal variances assumed	.344	-.689	.689
	Equal variances not assumed	.344	-.689	.689
EGGNO	Equal variances assumed	8.371	-2.855	30.655
	Equal variances not assumed	8.371	-2.993	30.793
CHICKEN	Equal variances assumed	.843	-.453	2.920
	Equal variances not assumed	.843	-.458	2.924
BEEF	Equal variances assumed	.250	-.668	.335
	Equal variances not assumed	.250	-.669	.336
MUTTON	Equal variances assumed	.198	-.530	.263
	Equal variances not assumed	.198	-.530	.264
PORK	Equal variances assumed	.155	-.410	.210
	Equal variances not assumed	.155	-.413	.213
PROCMEAT	Equal variances assumed	.749	-.699	2.299
	Equal variances not assumed	.749	-.717	2.317
FISH	Equal variances assumed	.600	-2.567	-.166
	Equal variances not assumed	.600	-2.574	-.160

**Independent Samples Test**

		t-test for Equality of Means		
		Std. Error Difference	95% Confidence Interval of the Difference	
			Lower	Upper
BEETROOT	Equal variances assumed	1.106	-.715	3.715
	Equal variances not assumed	1.106	-.719	3.719
CARROT	Equal variances assumed	1.555	-.079	6.146
	Equal variances not assumed	1.555	-.079	6.146
CABBAGE	Equal variances assumed	2.396	-8.929	.663
	Equal variances not assumed	2.396	-8.941	.674
ONION	Equal variances assumed	2.606	-5.816	4.616
	Equal variances not assumed	2.606	-5.821	4.621
SPINACH	Equal variances assumed	2.088	-9.014	-.653
	Equal variances not assumed	2.088	-9.018	-.649
PREFERE	Equal variances assumed	.4455	-2.1917	-.4083
	Equal variances not assumed	.4455	-2.1921	-.4079
DUSTBIN	Equal variances assumed	.209	-.684	.151
	Equal variances not assumed	.209	-.693	.160
BORROW	Equal variances assumed	1.469	-4.291	1.591
	Equal variances not assumed	1.469	-4.291	1.591
WILD	Equal variances assumed	.069	-.239	.039
	Equal variances not assumed	.069	-.242	.042
BEG	Equal variances assumed	.299	-.799	.399
	Equal variances not assumed	.299	-.800	.400
CREDIT	Equal variances assumed	.543	-1.888	.288
	Equal variances not assumed	.543	-1.889	.289
FRIEND	Equal variances assumed	.359	-1.069	.369
	Equal variances not assumed	.359	-1.069	.369

**Independent Samples Test**

		t-test for Equality of Means		
		Std. Error Difference	95% Confidence Interval of the Difference	
			Lower	Upper
SENDCHIL	Equal variances assumed	.994	-2.739	1.239
	Equal variances not assumed	.994	-2.740	1.240
CEREMONY	Equal variances assumed	.218	-.885	-.015
	Equal variances not assumed	.218	-.895	-.005
MEALSIZE	Equal variances assumed	.791	-3.116	.049
	Equal variances not assumed	.791	-3.124	.057
RESTCON	Equal variances assumed	.831	-3.346	-.021
	Equal variances not assumed	.831	-3.350	-.017
SKIPMEAL	Equal variances assumed	.598	-1.547	.847
	Equal variances not assumed	.598	-1.552	.852
CSI	Equal variances assumed	3.8408	-16.2066	-.8301
	Equal variances not assumed	3.8408	-16.2146	-.8220