YUNIBESITI YA BOKONE-BOPHIRIMA
NORTH-WEST UNIVERSITY
NOORDWES-UNIVERSITEIT

FOOD-BASED DIETARY GUIDELINES AS NUTRITION EDUCATION TOOL

A STUDY AMONG TSWANA WOMEN IN THE NORTH WEST PROVINCE

TSHWANELO KGENGWENYANE
B.HONOURS IN CONSUMER SCIENCES

Mini-dissertation submitted in partial-fulfilment of the requirements for the degree Masters in Consumer Science at the School of Physiology, Nutrition and Consumer Sciences at the North-West University

Supervisor: Dr. A. Kruger
Co-supervisor: Dr. M.D. Venter

2006
Potchefstroom Campus

FOOD-BASED DIETARY GUIDELINES AS NUTRITION EDUCATION TOOL

A STUDY AMONG TSWANA WOMEN IN THE NORTH WEST PROVINCE

TSHWANELO KGENGWENYANE
B.HONOURS IN CONSUMER SCIENCES

Mini-dissertation submitted in partial-fulfilment of the requirements for the degree Masters in Consumer Sciences at the School of Physiology, Nutrition and Consumer Sciences at the North-West University (Potchefstroom Campus)

Supervisor: Dr. A. Kruger, North-West University (Potchefstroom Campus)

Co-supervisor : Dr. M.D. Venter, North-West University (Potchefstroom Campus)

2006

North-West University

Potchefstroom Campus

ACKNOWLEDGEMENTS

I wish to express a special word of thanks to:

1. Dr. Annamarie Kruger, my supervisor, for her guidance, support and encouragement throughout my study.

2. Dr. Marietjie Venter, my co-supervisor. Her input and support contributed to the success of my study.

3. Dr. Suria Ellis of the Statistical Consultation Services of the North-West University (Potchefstroom Campus) for her assistance with the statistical analysis.

4. My sister Ms. Kelebogile Kgengwenyane for the typing of this dissertation.

5. Mrs. Mélanie Terblanche for the language editing.

6. Mrs. Carolien van Zyl for her time and help in finalising this dissertation.

My gratitude is also extended to:

7. Mr. Sonnyboy Segoe, who was my assistant, for his dedication.

8. My mother Keeditse, my brothers and sisters for supporting me throughout my study.

I also appreciate the efforts of the following people and institutions:

9. All the participants from the rural, urban formal, urban informal and the farm settlements, who took part in this research study.

10. My colleague, Mr. B. Sikhakhane, who encouraged and supported me throughout my study.

11. The Ferdinand Postma Library personnel for helping to collect relevant information.

ABSTRACT

BACKGROUND AND MOTIVATION

Food-Based Dietary Guidelines (FBDG) has been developed in South Africa as a consistent communication tool to represent agreement on how diet-related public health problems should be addressed. The guidelines demonstrate the striving towards equity in diet and health and the purpose is to optimise nutritional status in both disadvantaged and affluent communities.

AIM

The overall aim of the study was:

- To improve nutritional knowledge and practices by teaching rural, urban formal, urban informal and farm women of the Rustenburg area in the North-West Province using the food-based dietary guidelines.

The more specific aims were:

- To assess the effectiveness of the South African Food-Based Dietary Guidelines (FBDG) as a nutrition education tool using focus group methodology.

- To identify constraints in understanding and implementing Food-Based Dietary Guidelines (FBDG).

METHOD

The focus groups were held with recruited Tswana women from the Rustenburg area in the North-West Province. The population was classified in four (4) strata namely:

Group 1 = Rural

Group 2 = Urban Formal
Group 3 = Urban Informal
Group 4 = Farm

The nutrition education focused on the eleven (11) Food-Based Dietary Guidelines (FBDG). Training aids such as food pictures used. A questionnaire was completed as a baseline before the intervention and was repeated three (3) weeks after the intervention. The questionnaire was translated into the Tswana language. The evaluation was based on what they knew and their practices before the intervention as well as on what they remembered and whether they had been implementing the recommended steps afterwards (knowledge test and practices). Difficulties in implementing or reasons for not implementing the suggested steps were also reflected in the responses.

RESULTS AND DISCUSSION

The conclusion reached after the intervention was that the different groups interpreted the messages carried by food-based dietary guidelines differently.

Some groups reflected an increase in knowledge of a guideline as tested by the knowledge questionnaire and confirmed by the FBDG focus group discussions, while other groups reflected no change in knowledge for the same guideline. This was influenced by different circumstances such as preferences per individual and household, affordability and availability of food as well as prior knowledge.

Lack of money was identified as a constraint that had an adverse effect on the implementation of the guidelines. In general the majority of the focus group participants understood the Food-Based Dietary Guidelines (FBDG).

CONCLUSIONS

It can be concluded from this study that it is possible to make use of these Food-Based Dietary Guidelines (FBDG) as nutrition education tool with success, if barriers to applicability, such as affordability of food, are incorporated in understanding these guidelines.

It became apparent that health clinics are major resources and information centres for the Food-Based Dietary Guidelines (FBDG) and as a result there is a need for capacity building to the health workers rendering services in those health facilities.

RECOMMENDATIONS

- More time should be spend in discussions on the FBDG, especially with people of low educational level.

- Avoid repeated or phrased differently questions, because it causes confusion among the participants, e.g. question 2.16, "it is healthy to be physically active" and question 2.20, "being active has nothing to do with being healthy". Messages should be short and straight to the point.

- In nutrition education using the FBDG, foods that are used to explain the guidelines should be foods that the consumers are familiar with in order to avoid any misunderstanding.

- Community based development programmes to support nutrition education using the FBDG should involve projects such as food gardens to improve nutritional status and income generation, so as to sustain a healthy lifestyle.

ABSTRAK

AGTERGROND EN MOTIVERING

Voedselgebaseerde Dieëtriglyne (VGDR) is ontwikkel sodat daar 'n betroubare kommunikasiemiddel is wat dieëtverwante gesondheidsprobleme op dieselfde manier aanspreek en ook deurentyd op betroubare en verteenwoordigende wyse dieselfde boodskappe aan verbruikers deurgee. Die doel van hierdie dieëtriglyne is om die voedingstatus in minderbevoorregte en ook in welgestelde gemeenskappe te optimaliseer.

DOEL

Die algehele doel van hierdie studie was:

- Om die voedingskennis en praktyke van landelike, stedelik-formeel, stedelik-informeel en plaasbewoners, spesifiek vroue van die Rustenburg area in die Noord-Wes Provinsie, te verbeter deur hulle met behulp van die voedselgebaseerde dieëtriglyne te onderrig.

Die meer spesifieke doel was:

- Om die effektiwiteit van die Suid-Afrikaanse Voedselgebaseerde Dieëtriglyne (VGDR) as 'n voedingsopvoedkundige instrument te assesseer deur gebruik te maak van fokusgroep metodologie.

- Om die beperkinge rakende die begrip en implementering van die Voedselgebaseerde Dieëtriglyne (VGDR) te identifiseer.

METODE

Die fokusgroepe is gehou met Tswana vroue in die Rustenburg area van die Noordwes Provinsie komende uit vier (4) verskillende strata:

Groep 1	=	Landelike vroue
Groep 2	=	Stedelike vroue uit 'n formele woonbuurt
Groep 3	=	Stedelike vroue uit 'n informele woonbuurt
Groep 4	=	Vroulike plaasbewoners

Die voedingsopvoeding het op die elf (11) Voedselgebaseerde Dieëtriglyne (VGDR) gefokus en opleidingshulpmiddels soos prente van voedselprodukte is gebruik. Daar was van 'n spesifieke fokusgroepskedule, wat in Tswana vertaal was, gebruik gemaak.

'n Basislynvraelys rakende voedselkennis en praktyke is voor die intervensie en drie (3) weke na die intervensie voltooi. Die vraelys was ook in Tswana vertaal en die evaluering is gebaseer op wat hulle voor die intervensie geweet het en wat hulle algemene voedselpraktyke voor die intervensie was teenoor wat hulle na die tyd geweet en toegepas het.

RESULTATE EN BESPREKING

Die resultate na die intervensie dui aan dat verskillende groepe boodskappe soos oorgedra deur die Voedselgebaseerde Dieëtriglyne (VGDR) verskillend verstaan.

Sommige groepe se kennis oor sekere riglyne het toegeneem soos getoets deur die kennis vraelys en bevestig deur die VGDRfokusgroepbespreking, terwyl ander groepe geen veranderinge in kennis vir dieselfde riglyn getoon het nie. Die kennisverandering was verder beïnvloed deur die voorkennis van deelnemers asook verskillende faktore soos die beskikbaarheid en bekostigbaarheid van sekere produkte asook die voorkeure van die individue en huishoudings.

'n Tekort aan geld word aangedui as die belangrikste beperking wat verhoed dat riglyne toegepas word. Oor die algemeen het die meeste deelnemers die Voedselgebaseerde Dieëtriglyne (VGDR) verstaan.

GEVOLGTREKKINGS

Daar word tot die gevolgtrekking gekom dat die Voedselgebaseerde Dieëtriglyne (VGDR) suksesvol gebruik kan word as 'n opvoedkundige program in dieëtvoorligting mits as die beperkinge soos bekostigbaarheid ensovoorts in die program geïnkorporeer word.
Dit is ook duidelik dat gesondheidsklinieke 'n belangrike hulpbron en inligtingsentrum vir hierdie Voedselgebaseerde Dieëtriglyne (VGDR) is. Na aanleiding van hierdie gevolgtrekking het dit duidelik geword dat daar 'n behoefte aan die verbetering en uitbreiding van die kapasiteit van gesondheidswerkers in hierdie verband behoort plaas te vind.

AANBEVELINGS

- Hierdie studie het getoon dat die tyd wat bestee is aan die fokusgroepbesprekings, veral by mense met 'n lae opvoedkundige peil, onvoldoende was. Heelwat meer tyd behoort spandeer te word aan groepbesprekings om kennis voldoende oor te dra.

- Vrae in die kennis toets moet kort, reguit en op die punt af wees.

- Indien die VGDR gebruik tydens word vir dieëtvoorligting moet die voedselvoorbeelde wat gebruik word om die riglyne te verduidelik aan verbruikers bekend wees sodat misverstande beperk kan word.

- Gemeenskapsgebaseerde opvoedkundige voedingsprogramme wat van die VGDR gebruik maak behoort groentetuine en inkomstegenereringsprojekte in te sluit om 'n gesonde lewenstyl te bevorder.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF ABBREVIATIONS

ACSM	American College of Sport Medicine
ADA	American Dietetics Association
ADSA	Association of Dietetics for South Africa
CHD	Coronary Heart Disease
DOE	Department of Education
DOH	Department of Health
FAO	Food and Agricultural Organization
FBDG	Food-Base Dietary Guidelines
HIV/AIDS	Human Immune-deficiency Virus/Acquired Immune Deficiency Syndrome
INP	Integrated Nutrition Programme
MRC	Medical Research Council
NCD	Non-Communicable Disease
NFCS	National Food Consumption Survey
NIDDM	Non-Insulin Dependent Diabetes Mellitus
NSSA	Nutrition Society of South Africa
PSNP	Primary School Nutrition Programme
SAJClinNutr	South African Journal of Clinical Nutrition
SAMB	South African Meat Board
SAS	Statistical Analysis System
SASA	South African Sugar Association
THUSA	Transition and Health during Urbanisation of South Africans
UNICEF	United Nations Children's Fund
USA	United State of America
USCDC	United State Centres for Disease Control
VGDR	Voedselgebaseerde Dieëtriglyne
WG	Working Group
WHO	World Health Organization

CHAPTER 1: INTRODUCTION

1.1 Background

Many people offer nutrition education to individuals and communities to promote healthy diets and a healthy lifestyle. These attempts are often unsuccessful because the nutrition messages are inappropriate (Anon, 2000). The aim with the South African Food-Based Dietary Guidelines (FBDG) is to address the nutrition transition experienced by many South Africans, the consequences of which have been the double burden of over and undernutrition, often occurring within the same household.

According to Gibney (1997); Vorster *et al.* (1997) and FAO/WHO (1998) the health/disease status of South Africans and their food consumption patterns indicate that nutrition education has not made the expected or required impact on achieving optimal nutritional status. It is likely that the dietary/health messages being used to promote healthy diets and lifestyles are inappropriate because they do not reflect the country's specific health issues, and are not applicable to all ethnic groups regarding their lifestyle, cultural eating habits and socio-economic circumstances.

Most countries are engaged in nutrition education of some form in an attempt to promote appropriate diets and a healthy lifestyle. Nutrition education presents some unique challenges. While the origin of all human behaviour is complex, nutrition behaviour adds a further dimension involving the capacity to discriminate among different foods. This is complicated further by the fact that no food can be singly labelled "bad" or "unhealthy" as it is the quality as well as the quantity of consumption that affects health. When food insecurity is a factor, the effect of nutrition messages may be limited and in all probability efforts may tend to focus more on combating hunger and undernutrition, encouraging self-sufficiency and supporting environmental and economic sustainability (Smith & Smitasiri, 1997; ADA, 1996).

Today's consumers are also faced with a multitude of nutrition related messages, some of which may add to confusion as they contain contradictory statements. To help

consumers discriminate between these messages, nutrition educators are encouraged to use strategies that enable them to be heard, they need to be beyond the mere provision of information and aim at producing nutritionally literate, motivated people who are willing and able to apply their nutrition knowledge in order to create sustained behavioural changes conducive to health and wellbeing.

To accomplish this task, nutrition researchers recommend that nutrition education interventions include the community in all aspects of development, particularly the planning stages when nutrition/health concerns, dietary habits and lifestyles are investigated so that appropriate, sustainable strategies will be developed (Love *et al.*, 2001).

Nutrition education was among the priority issues at the International Conference on Nutrition held in Rome in 1992 where South Africa was one of the one-hundred-and-fifty-nine (159) countries that formally adopted the World Declaration and Plan of Action for Nutrition. This Declaration comprises of a number of goals aimed at eliminating or substantially reducing famine and famine related deaths, chronic malnutrition, micronutrient deficiency and diet related communicable and non-communicable diseases. To achieve these goals, several strategies have been suggested. One of these strategies is the promotion of appropriate diets and lifestyles, the reasoning being that most factors affecting the health/nutritional status of individuals are linked to their diets and/or lifestyles (FAO/WHO, 1992).

In response to the World Declaration and Plan of Action for Nutrition, and recognising the need for more effective nutrition education interventions, the World Health Organization (WHO) and Food and Agricultural Organization (FAO) convened an international consultation in Cyprus in 1995. The aim was to discuss the development of FBDG as an effective nutrition education tool (FAO/WHO, 1998).

The conclusion deduced from the discussion was that Food-Based Dietary Guidelines (FBDG) should be developed in a specific socio-cultural context, which requires an understanding of prevailing food consumption and nutrition habits and of barriers to change including socio-economic, environmental, cultural and religious factors of a specific community. FBDG should be easily understood by the general public and should,

therefore, use simple terminology to encourage enjoyment of appropriate dietary intakes, reflect food patterns rather than numerical nutrients goals and also acknowledge that a wide range of food patterns can be consistent with good health. It should also be based on or designed to improve current dietary practices and prevailing diet related public health problems (FAO/WHO, 1998).

1.2 Aim of the study

The general aim of the study was to assess the effectiveness of the South African preliminary FBDG as a nutrition education tool by using focus group methodology. This study on the Tswana population was part of a larger study with the same aim that included the Tsonga and Pondo populations.

1.3 Objectives

The main objectives of the study included the following:

- To improve nutritional knowledge and practices by teaching rural, urban-formal, urban-informal and farm participants of the Rustenburg area in the North-West Province using the FBDG.

- To identify the constraints in understanding and implementing the FBDG.

1.4 Research design

1.4.1 The study

The study was part of the multicultural study project designed to improve nutritional knowledge and practices focusing on the Tswana, Tsonga and Pondo ethnic groups. This study assessed the effectiveness of FBDG as a nutrition education tool, as well as the appropriateness thereof for the Tswana group by using focus group methodology. The study was conducted in the Rustenburg area in the North-West Province in rural, urban-formal, urban-informal and farm strata.

1.4.2 Study population

The participants were from different strata which were rural, urban formal, urban informal and farms. There were two groups per strata except for the urban informal area, where it was possible to use only one group. Groups consisted of approximately eight (8) women per group. It was a convenient sample and everyone that turned up were included in the study. The including criteria was that participants should be female volunteers who were responsible for buying and preparing food in their households.

1.4.3 Measuring instruments

A questionnaire was developed to collect demographic information, to measure the knowledge and to investigate the practices of the women responsible for buying and preparing food in their homes. The questionnaire was used as a baseline and post-intervention instrument. It was translated into the Tswana language and tested for face validity with five (5) individual Tswana speaking people. The baseline questionnaire was completed by individual women who took part in the focus group sessions before conducting the nutrition intervention of FBDG.

1.4.4 Intervention: focus group discussion

In each area, five (5) days were utilised for organising focus groups and conducting the baseline questionnaire and nutrition education sessions. Participation was voluntary. The intervention was focusing on the eleven (11) FBDG using focus group discussions. Training aids such as food pictures were used. Post questionnaire was conducted three (3) weeks after the nutrition intervention.

1.4.5 Post-intervention

The same questionnaire was used as a post-intervention instrument after conducting focus group discussions. It was an evaluation based on what the subjects knew as well as their practices before the intervention.

1.4.6 Analysis of the data

The questionnaire was analysed to assess participants' ways and practices, and also what knowledge they had before and after the FBDG sessions as discussed in detail in Chapter 3.

1.5 Significance of the study to the consumer scientist

The FBDG have been developed and implemented internationally and in South Africa, but the implementation thereof have not always been monitored and evaluated. This study will not only evaluate the success of the application of these guidelines but also assess the applicability of education based on FBDG as an educational intervention. Consumer Scientists often work in communities as educationalists and try to improve, amongst other life skills, communities' nutritional knowledge and practices.

Consumer Science is an interdisciplinary and applied discipline that aims to improve the quality of human livelihoods (Kiamba, 1998). Research and knowledge about the successful implementation of the FBDG will be valuable to the above professionals in their aim to provide basic nutrition principles to individuals, families and communities. Ultimately the improvement of nutritional knowledge may form part of holistic interventions that can improve the lifestyles and quality of life in the communities.

1.6 Structure of the mini-dissertation

The mini-dissertation is divided into six (6) chapters. A short discussion outlines the structure and contents of each chapter.

In Chapter 1 the rationale behind this mini-dissertation, as well as its objectives are discussed. It also indicates how this mini-dissertation is structured.

Chapter 2 consists of the reviews of the literature study. The history of the development of the FBDG internationally, as well as in South Africa is discussed. The implication of

the development of the FBDG is also discussed. Nutrition problems and interventions are discussed, and lastly the indigenous Tswana food practices are explained.

In Chapter 3 the methodology of the study is discussed. This includes the subjects, where they were located, instruments used to collect data and methods used to analyse the results.

In Chapter 4 the results are presented in tables per group and per food-based dietary guideline.

The results of the study are discussed in Chapter 5.

In Chapter 6 conclusions are drawn with regard to each guideline and recommendations for applying the FBDG are made among the members of the Tswana group.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

Chapter 2 consists of the review of the literature and will be discussed according to nutrition related public health concerns, nutrition education, Food-Based Dietary Guideline (FBDG) and the South African and international development process of suitable guidelines. Lastly the indigenous Tswana food practices will be reviewed.

2.2.1 Nutrition related public health concerns

Our health and wellbeing, quality of life and ability to learn, work and play depend on how well we are nourished. Good nutrition together with a stable nutritional status depends on many complex and inter-related determinants such as food, care and health services (Vorster *et al.*, 1997). Dietary patterns have varied over time depending on agricultural practices and climate, ecological, cultural and socio-economic factors that determine the food availability.

In South Africa, the co-existence of under and over nutrition is evident among different population groups, but also within a single population group and even within the same household. A nutrition status survey, undertaken in a semi-rural village of Lebowa (Northern Province) revealed that of six-hundred-and-fifty-nine (659) pre-school children, twelve percent (12%) were underweight and twenty-eight percent (28%) stunted. Of their siblings two-hundred-and-fifteen (215) were underweight and thirty-six percent (36%) stunted. In contrast thirty-one percent (31%) of their caretakers (mother or grandmother) were overweight (Steyn *et al.*, 1994).

The nutrition related public health concerns of both children and adults were investigated to identify similarities and/or differences. The main nutrition related public health concerns of South Africa can be summarised as follows:

- High maternal mortality rate among (rural) black women (Henry, 2001).

- High infant mortality rate among (rural) black infants (Henry, 1998).

- Low life expectancy for black and coloured adults (Henry, 1998).

- Undernutrition, especially among black and coloured children under five (5) years of age in the form of low weight, wasting, underweight for age, stunting and low micronutrients (particularly vitamin A, iron and folate) intakes (Labadarios *et al.*, 2001).

- Overweight and obesity among children (aged 1-9 years) and adults (aged 15-64 years) (Labadarios *et al.*, 2001; Henry, 2001).

- "Risky" lifestyle behaviours among total population in the form of smoking, excessive alcohol consumption, inactivity, HIV and AIDS (Dorrington *et al.*, 2001).

2.2.2 Nutrition education

Effective nutrition education can be defined as a communication process that goes beyond information dissemination, but aims at producing nutritionally literate, motivated people who are willing and able to apply their nutrition knowledge in order to create sustained behavioural change conducive to health and wellbeing (Stuart & Achterberg, 1997; ADA, 1996).

Today consumers are faced with a multitude of, and often conflicting, nutrition messages. As a consequence, consumers are beginning to discount them entirely, a phenomenon referred to as a nutrition backlash, which includes negative feelings towards nutrition information such as scepticism, anger, guilt, worry, fear and helplessness (Patterson *et al.*, 2001). To help consumers discriminate among nutrition messages, nutrition educators have to use strategies to make them heard above competing information. For effective nutrition education, it is suggested that such strategies make use of approaches, messages and support that will enhance awareness, increase knowledge and most importantly establish the motivation needed for behaviour change (Contento *et al.*, 1995).

2.2.3 Food-Based Dietary Guidelines

Gibney and Vorster stated that the massive global burden of diet related diseases and the growing perception that nutrient based dietary guidelines are not effective in promoting appropriate diets and therefore the need for healthy lifestyles have motivated a number of countries and regions to develop FBDG (Gibney & Vorster, 2001).

These guidelines were formulated to address under and over nutrition in different communities. The emphasis was based on existing eating patterns as well as commensality within the various South African dietary cultures (Gibney & Vorster, 2001).

In South Africa, a selected group, representing different stakeholders, developed the guidelines over a period of four (4) years (Gibney & Vorster, 2001 South African Nutritionists have an advocacy role in ensuring that these FBDG receive sufficient media and political exposure to be incorporated into health policy, they also have an educational role in ensuring that all professionals in public health understand the potential of the guidelines to help improve dietary intakes (Gibney & Vorster, 2001).

The guidelines demonstrate the striving towards equity in diet and health, aiming to optimise nutritional status in both disadvantaged and affluent communities. The nutrition transition in many developing countries has been characterised by a transition from under to over nutrition. It is generally accepted that to have effective dietary interventions (such as implementation of the FBDG) at a population level, it should be comprehensive, population-based, integrated, multidisciplinary and multi-sectorial. Therefore, implementation should involve a complementary range of actions, from policy, environmental, community and individual levels. The challenge is to integrate these dietary recommendations into a national plan of action aimed at promoting appropriate diets, physical activity and a healthy lifestyle (Gibney & Vorster, 2001).

2.2.3.1 Defining Food-Based Dietary Guidelines

Dietary guidelines are qualitative (descriptive) statements that express dietary statements that express dietary goals in terms of foods, rather than nutrients and provide user-friendly nutrition information about the total diet. They reflect the most current scientific understanding of nutrition's role in health and present this information as simple, practical information for choosing optimal eating habits. In some countries they form the basis of nutrition policies and programmes. Over the years, dietary guidelines have become more positive, also focusing on pleasurable food choices, and not only disease prevention, to promote good health (Truswell, 1998; WHO, 1998; Clay, 1997).

Using a food-based approach, they take into account customary dietary patterns and indicate dietary modification to address health concerns particular to the population for which they are compiled (Truswell, 1998; WHO, 1998; Clay, 1997).

2.2.3.2 The process of developing Food-Based Dietary Guidelines

For dietary guidelines to be effective as a nutrition education tool, the FAO/WHO consultation agreed that FBDG should be country specific, that is, they should reflect:

- the country's specific nutrition related public health concerns;
- the availability, accessibility, price of food; and
- their acceptability to all populations regarding their lifestyle, cultural eating habits and socio-economic circumstances (WHO, 1998; Gibney, 1997).

The starting point for the developing of FBDG is therefore the relevance to a specific public health concern rather than an existing gap between current intake of a particular nutrient and its numerical recommended daily intake. FBDG should also be based on what can be realistically achieved within the social, economic, agricultural, supply and cultural contexts of the country rather than an attempt to eliminate in one step the entire difference between desired and actual intakes. Once the public health issues have been identified, a transition needs to be made from the nutrients involved to food-based strategies that are likely to be successful. It is important to ascertain the extent to which non-nutritional factors (such as infection, safe water, smoking and physical activity) may

be implicated, as these may have to be addressed in order for the nutrition strategies to be fully successful (WHO, 1998).

The FAO/WHO (1998) consultation suggests a 10-step development process for the generation of FBDG as listed below:

- Formation of a working group, comprising of agriculture, health and education representatives, food science and nutritional science sectors of academy, consumer groups and other non-Governmental organisations, food industry and communication.

- Collection of data on nutrition related disease, food availability and food intake patterns, current practices, subsidies and other Governmental policies in the country.

- Identification of major nutrition related problems for dietary guidelines to be useful and implemented in the present situation.

- Formulation of a draft set of FBDG statements.

- Preparation of background (technical support) papers for each FBDG statement.

- Testing of the FBDG statement on consumers and revising where necessary.

- Finalisation of background papers and submission for comments to local and interested groups.

- National adoption of FBDG.

- Dissemination through training and mass media.

- Reviewing of FBDG as additional scientific evidence becomes available regarding nutrients health effects, and in accordance with changes in dietary consumption patterns of the population.

Since the publication of the FAO/WHO consultation report, proposals have been made for international collaboration in the development of the FBDG. As a first step in the process, European Union countries have begun to gather food and nutrient intake data to provide a basis for the formulation of relevant FBDG for the region as a whole (FAO/WHO, 1998).

2.2.3.3 Development of Food-Based Dietary Guidelines for South Africa

A meeting was held in Durban in 1997 whereby a Working Group (WG) was established to develop a core set of FBDG to promote health for South Africans older than five (5) years of age. The decision to develop separate FBDG to promote health for South Africans younger than five (5) years was based on their specific diet related public health issues, mainly undernutrition (Vorster *et al.*, 2001).

The key objectives of the WG were:

- to create consensus within the group regarding the role of nutrients and dietary patterns in the public health profiles of South Africa:
- to test the consumers' understanding of the guidelines, as well as the latter's appropriateness and applicability;
- to write scientific support papers for each guideline, motivating its formulation, background and aims;
- to write an explanatory text on the FBDG for the layperson, for use by consumers and health personnel in nutrition interventions;
- to provide advice on how the guidelines should be incorporated into health and agricultural policies;
- to advise on the implementation and promotion of the guidelines, the development of appropriate education materials and to monitor the impact on eating patterns;

- to adapt the guidelines for groups with special dietary needs; and

- to contribute to a process in which the guidelines are reviewed every five (5) years.

The WG followed the process as advised by the FAO/WHO through adapting the FBDG to local conditions. They reviewed the South African literature by identifying nutrition related public health problems and nutrients intake of different groups and relevant public health policies (Vorster *et al.*, 2001).

Another meeting was held in Pretoria in 1997 where delegates from Academia, Nutrition Society of South Africa (NSSA), Association for Dietetics of South Africa (ADSA), the Medical Research Council (MRC), Department of Health (DOH), United Nations Children's Fund (UNICEF), the agricultural sectors, food industry and observers from the Food and Agricultural Organization (FAO) intensively debated the solicited reviews on the South African nutritional situation. Consensus was reached on the following realities and assumptions (Vorster *et al.*, 2001):

- Malnutrition including under and over nutrition, is associated with avoidable morbidity and mortality.

- In South Africa, malnutrition contributes to the different patterns of morbidity and mortality of different population groups and communities.

- Many South Africans are experiencing rapid urbanisation and acculturation, characterised by a nutrition transition that often results in both over and undernutrition, a double burden of nutrition related disease is prevalent in many households and communities.
- Different types of ethnic food choices (including the combination of certain foods based on traditional African-Western food intakes) are compatible with good nutrition and health.

- Except for spoiled and contaminated food, there is no such food as bad food, only bad diets.

- Many factors influence food choice, and nutritional intakes can be considered but one of the controllable lifestyle factors by which general health status is influenced. Therefore, the usual food choices should be evaluated in the context of total lifestyle and living circumstances. In South Africa, socio-economic circumstances have a major influence on food choices and dietary patterns.

- Although South Africa produces enough food for all its inhabitants, and even exports food, many poor households are food insecure, especially in rural areas and informal housing areas inhabited by people in transition.

- Food safety, mainly because of an increase in street vendors, may become a progressive problem in the future.

Based on the above discussion, Vorster *et al* (2001) described that a document was compiled indicating the relevant nutritional issues that could lead to a guideline (variety, meal, body weight, exercise and energy, carbohydrate, fibre, vitamins and minerals, protein, fats and sodium, water and alcohol, smoking and stress). The accompanying nutritional recommendations were indicated and a preliminary FBDG for each was formulated with a motivation. The scientific background in the South African context was summarised for each guideline (Vorster *et al.*, 2001).

The document and other relevant papers were discussed in the workshop that formed part of the Nutrition Congress in May 1998 at Sun City. Based on the discussion, revised sets of guidelines were compiled during a follow-up workshop in Cape Town in August 1998 (Vorster *et al.*, 2001).

A protocol for field testing the guidelines was developed and agreed upon on the 18th January 1999 in Durban. The methodology for field testing was through focus group discussion with women from different ethnic groups in rural and urban areas in the two provinces. Love *et al.*, 2001 reported the results of this process. Focus group discussions were held using home languages of the participants (English, Afrikaans, Zulu and Xhosa). The results of these evaluations were incorporated into the guidelines during a meeting on the 18th January 2000 in Durban. It was also decided that focus group discussions would continue in other Provinces to ensure that the perceptions of

other ethnic groups and cultures would also be accommodated. A decision was taken to form additional Working Groups to investigate the development of FBDG for specific priority groups such as Human Immune-deficiency Virus/Acquired Immune Deficiency Syndrome (HIV/AIDS) sufferers, children younger than five (5) years, elderly, and pregnant and lactating women. Steps for the writing of a support text for each guideline were identified and further discussions with nutrition communities took place during a symposium at the Nutrition Congress in Durban on the 15th August 2000 (Vorster *et al.*, 2001).

2.2.3.4 Scientific consideration in the development of Food-Based Dietary Guidelines: the rationale

There is good scientific evidence that dietary patterns, i.e. the daily combination of foods and beverages have specific results in terms of health or disease. For example, a diet may be apparently adequate in all other ways but still be deficient in vitamin A or iron, and this may lead to xerophthalmia or anaemia. The reasons for developing and using FBDG are many and often self-evident:

- Foods make up a diet and should, therefore, be considered as more than merely a collection or accumulation of nutrients.

- Nutrients interact differently when presented as foods.

- Methods of food processing, preparation and cooking influence the nutritional value of foods.

- There is already good evidence from animal, clinical and epidemiological studies that specific dietary patterns are associated with a reduced risk of specific diseases. Diets rich in vegetables and fruits are associated with various positive outcomes such as a reduced incidence of lung cancer. Science has not yet been able to identify completely the specific nutrients involved.

- Some food components may have biological functions that science has not yet identified.

- Foods and diets have cultural, ethnic, social and family aspects that individual nutrients themselves do not have.

- For certain micronutrients, evidence suggests that an intake higher than that recommended at present, may help to lower the risk of non-communicable disease. FBDG can encourage patterns that include these nutrients (WHO, 1998).

2.2.3.5 International dietary guidelines

Dietary guidelines have been published in at least twenty countries. Table 2.1 gives a summary of some countries that published dietary guidelines and it is clear that there is almost complete agreement among countries on the following recommendations:

- Eat a nutritionally adequate diet composed of a variety of foods.

- Adjust energy balance and weight balances.

- Eat plenty of foods containing carbohydrates and fibre.

- Use salt sparingly.

- Eat a low fat diet.

- Drink alcohol in moderation, if alcohol is taken at all.

One can also see from Table 2.1 that FBDG are set to address specific health problems in countries as indicated in the guidelines. In all countries the dietary guidelines are continually modified to suit the needs of the people of that particular country.

Table 2.1: Summary of dietary guidelines of different countries

Australia (adopted 1982)	South Africa (adopted 1998)	Canada (adopted 1989)	Asian Region (adopted 1997)	Developing Countries (adopted 1995) (FAO)	America (4th edition 1995)	Britain Danish (adopted 1995)
Eat a wide variety of nutritious foods	Enjoy a variety of foods	Enjoy a variety of foods	Enjoy a variety of foods	Enjoy a variety of foods	Enjoy a variety of foods	-
Eat plenty of breads and cereals (preferably whole grain) vegetables including legumes and fruits	Make starchy food the basis of most meals	Emphasise cereals, breads other products, vegetables and fruits	Eat whole grain cereals, legumes, roots and tubers	-	Choose a diet with plenty of grain products, vegetables and fruits	Eat plenty of breads and cereals. Eat potatoes, rice or pasta every day
Eat a diet low in fat and in particular low in saturated fat	Use fat sparingly	Choose low fat dairy products, vegetables and fruits	-	-	Choose a diet low in fat, saturated fat and cholesterol	Use only small amounts butter, margarine & oil
Maintain a healthy body weight by balancing physical activity and food intake	Be active	Achieve and maintain healthy body weight by enjoying regular physical activity & healthy eating	Eat enough food to meet body needs and healthy body weight	Keep active, stay fit	Balance the food you eat with physical activity, maintain or improve your weight	-
Eat only moderate amounts of sugar and foods containing added sugars	-	-	Moderate sugar intake	-	Choose a diet moderate in sugar	-
Choose low salt foods and use salt sparingly	Use salt sparingly	Limit salt, alcohol and caffeine	Limit salt intake	-	Choose a diet moderate in salt and sodium	-
If you drink alcohol limit your intake	If you drink alcohol drink sensibly	Limit alcohol	Avoid or limit alcohol	-	If you drink alcohol beverages, do so in moderation	-
-	Eat plenty of fruits and vegetables everyday	-	Eat plenty of fruits and vegetables regularly	-	-	Eat fruit and plenty of vegetables everyday
Encourage and support breastfeeding. Eat food containing calcium. This is particularly for girls and women. Eat foods containing iron. This applies to girls, women, vegetarians and athletes	Eat legumes. Food from animals can be eaten daily. Drink lots of clean, safe water	Limit caffeine	Eat clean and safe food	Eat to meet your need. Protect the quality and safety of your food	-	Eat fish and fish products often. Select low fat meat products. Select low-fat milk and milk products

2.2.3.6 Specific problems

The development of the guidelines was a daunting task because of the complexity of nutrition-health relationships in South Africa's multicultural society and the goal of having one set of guidelines for all. Many issues based on available evidence could not be resolved with clear-cut answers, for example the absence of a separate dairy guideline and guideline on the intake of foods from animals (Vorster *et al.*, 2001).

The result of the testing of the preliminary guidelines further influenced the formulation and working of the guidelines (Love *et al.*, 2001). The "variety" guideline debate took into consideration issues of affordability of variety in poor households, in contrast to the situation in the United States of America (USA) where the elimination of this guideline was based on its suspected contribution to their obesity problem (Harris, 2000). A separate guideline about milk intake was not included, based on affordability, dietary patterns and lactose intolerance in a large part of the South African population. However, the low calcium intakes of many South Africans, the importance of calcium in growth, development and prevention of bone disorders, and also possible prevention of hypertension were acknowledged and contributed to the formulation of the "animal food" guideline (Vorster *et al.*, 2001).

The guideline about intake of meat, fish, chicken, milk and eggs was difficult to formulate in a positive way to be relevant for all South Africans. The available evidence suggested that during the nutrition transition, when more foods from animals were eaten, nutritional status improved (MacIntyre, 1998). The high prevalence of iron deficiency, especially in African children and adolescents, is a sound motivation for increased intakes of especially red meat. However, there is convincing evidence that increased fat intake and risk of chronic diseases are realities that should not be ignored. Therefore, this particular guideline should be accompanied by nutrition education (information) to recommend optimal daily quantities (Vorster *et al.*, 2001).

2.2.3.7 Funding the process

South African Sugar Association (SASA) and the South African Meat Board (SAMB) funded the first workshop on the FBDG developments. Delegates from the food industry,

Department of Health (DOH), Dry Bean Producers Organization, the Medical Research Council (MRC) and academia were funded by their own institutions. United Nations Children's Fund (UNICEF) funded the evaluation of guidelines in field studies. The Food and Agricultural Organization (FAO) and International Life Science Institute jointly funded a group of South African delegates to share the South African experience with eleven (11) other African countries during a workshop in Harare in October 1999 (Vorster *et al.*, 2001).

2.2.3.8 Critical factors for success

In the South African process review, a number of factors which determined the steady progress and output of a set of thoroughly "filtered" guidelines emerged. The most important was that the WG decided to choose a dedicated chairperson with sufficient time, "vested interest" and the necessary background knowledge and expertise to lead and drive the process. Ms. Penny Love, who is a consultant dietician, was available as a chair and could motivate the process as part of her Ph.D studies and could obtain funding for the extensive evaluation process. Another factor was that, although limited in certain areas, sufficient information on the public health problems in South Africa, as well as nutrient intake and dietary patterns of different groups, was available to serve as the basis for the FBDG. Other factors were sufficient funding, the multidisciplinary nature of the WG and the extensive and open discussion during the various workshops. Clearly, these guidelines were developed in a highly participatory and consultative manner (Vorster *et al.*, 2001).

2.2.3.9 The way forward

The present set of guidelines has been finalised after evaluation of its comprehension and practicality in different South African ethnic groups, e.g. the Zulu's. A user-friendly explanatory text for health personnel and the consumer, showing how the application of the guidelines can lead to healthy eating, has been written by Browne (Guidelines for healthy eating for South Africans – unpublished data, 2000). The scientific support papers are published in the supplement of the South African Journal of Clinical Nutrition (SAJClinNutr). It should be noted that because ethnic differences in dietary patterns and

consequently differences in nutrition related disease, profiles do exist, these papers sometimes refer to different ethnic groups in South Africa (Vorster *et al.*, 2001).

The guidelines have been developed as one set, to optimise nutritional status of all South Africans. The guidelines were discussed at a special symposium of the 2000 Nutrition Congress. The next step was to implement so as to improve dietary patterns of all South Africans, combined with the development of a protocol for evaluation of implementation and impact of the FBDG.

These guidelines could and should be used in the Integrated Nutrition Programme (INP) of the Department of Health (DOH) and should form the basis of nutrition education in the Primary School Nutrition Program (PSNP) and the national education curriculum of the Department of Education (DOE). For successful implementation, there seems to be agreement that modern marketing strategies should be used (Vorster *et al.*, 2001).

2.3 The African population of the North-West Province

2.3.1 Historic overview

According to central statistics in 1997, the present population of the North-West Province (3 million), comprises of approximately sixty-three percent (63%) Setswana, fourteen percent (14%) Isixhosa and eight percent (8%) Sesotho speaking people. The Tswana, Northern Sotho and Southern Sotho speaking citizens together, make up the Sotho people. Thus the history of the African population of the North-West Province can be described primarily as the history of the Sotho and Tswana people, who make up the majority of the population. This classification is based on a common language base as well as certain shared practices (Maylam, 1986). The people who have inhabited the highveld plateau of the South African interior are thus referred to as the Sotho-Tswana. The knowledge of the origins of the Sotho-Tswana people is based primarily on oral tradition. According to legend, the Sotho and Tswana people originated from the bed of reeds at Ntswanatsatsi (where the sun rises) (Lye, 1980a). It is probable that the ancestors of the present day Sotho-Tswana people migrated from the north in several migrations separated in time and from different stocks (Van Warmelo, 1974) and

dispossessed or absorbed the earlier San inhabitants of the area. The initial migrations have been placed in the 13th to 14th centuries or earlier (Lye, 1980a).

The early history of the Sotho-Tswana was characterised by the diffusion of chiefdoms into smaller groups and fusions with other groups. Despite frequent quarrels and splitting, the people appear to have prospered and spread over the North-West Province, Northern Cape, North-West Free State and Eastern region of Botswana (Van Warmelo, 1974). By the beginning of the 19th century, when the first contact with white explorers was made by the Tlhaping tribe (Schapera & Comaroff, 1991), the Sotho-Tswana group was a well-established population (Setiloane, 1976) with complex and well-developed social and political institutions (Cornwell, 1988). The Southern Sotho occupied the land south and east of the Vaal River and the Tswana, the larger area in the North-West (Lye, 1980a).

At the beginning of the 19th century, the warriors of the powerful Zulu nation in Natal moved northwards with devastating force, attacking and dispersing tribes in the path. The Sotho-Tswana were unprepared for this onslaught, being fragmented chiefdoms without common leadership, such as in a confederacy, and occupying land difficult to defend (Cornwell, 1988). Refugees from the Zulu attacks, in turn, attacked their neighbours by setting up a chain reaction of attack and counter attack that caused devastation, which spread through the Free State to the Tswana region between the Orange and Vaal Rivers and also further to the North-West. This period of unrest and war became known as the Difaqane, a Sotho word meaning the "scattering" (Maylam, 1986; Lye, 1980b) and lasted for two decades from approximately 1812 to 1837 (Van der Wateren & Immelmann, 1988).

The effects of the Difaqane on the Tswana were devastating and the Sotho-Tswana peoples suffered continuously from invasions. Many had to flee from their traditional lands, and they permanently lost their heartland, first to the Ndebele and later to the white settlers, who annexed it before the Tswana could return (Lye, 1980b; Maylam, 1986). The Difaqane possibly marked the first changes to the "traditional" Sotho-Tswana lifestyle that could increase in momentum with contact with Europeans and urbanisation. The first missionary contact with the Tswana was in 1816 by the London Missionary Society among the Tlhaping, the Southern tribe (Lye, 1980a). During the next thirty (30)

years, most of the other tribes, apart from those in the far North, had contact with traders, explorers and hunters. Between 1820 and 1846 mission stations were established among several tribes including Barolong, Bahurutshe, Bakgatla and Bakwena (Schapera & Comaroff, 1991).

In addition to contact with the missionaries, the Sotho-Tswana came into contact and conflict with the Voortrekkers who had trekked from the Cape and settled in the Transvaal. In 1852, the South African Republic was created by the amalgamation of several smaller states. The presence of the white farmers put further pressure on the Sotho-Tswana by reducing the amount of land available for agriculture and hunting. As the 19th century progressed, the Sotho-Tswana came into more and more contact with white people and were caught up in the political and economic movements of the time. By the end of the 19th century, the area originally occupied by the Sotho-Tswana had been divided among the Cape Colony in the South, Great Britain in the North and the South African Republic in the East. Reserves were established for the Tswana in the Transvaal, British Bechuanaland and the British Protectorate, but whites already occupied much of the land in these areas.

The power of the chiefs was greatly curtailed and the people had to pay taxes to the European Governments. The agricultural base was eroded and replaced by increasing dependence on employment by whites for survival (Schapera & Comaroff, 1991). The combined effects of the Difaqane and the presence of white settlers were the scatter of the Sotho-Tswana people throughout Southern Africa. However, the ancestral lands, which survived the Difaqane and the settlement of whites, have been maintained (Setiloane, 1976). Likewise, although the Sotho-Tswana culture has been changed by the incorporation of the white culture, much of the core culture has remained (Comaroff & Comaroff, 1991).

2.3.2 Indigenous foods for the Tswana groups

More often rural diet has been associated with undernutrition and increased risk of infections and diseases, especially in children. Undernutrition occurs when the body is supplied with an insufficient amount of food and nutrients needed to grow or to maintain body functions and to be physically active (Vorster *et al.*, 1997). Other determinants of

malnutrition are abnormal physiological conditions caused by deficiencies, excess or imbalances in energy, protein and other nutrients, lack of care, household food insecurity, diseases, poverty and lack of health services.

Despite a small variety of foods, low fat and high fibre, rural diets can be adequate in both macro and micro nutrients and is associated with low risk of both infectious and chronic diseases (Vorster *et al.*, 1997). Macronutrients are carbohydrates, proteins and fats, and they are required by the body in large amounts and available to be used for energy. Micronutrients are vitamins, minerals and certain other substances required by the body in small amounts.

The Batswana are used to three meals per day, consisting of breakfast, lunch and supper. Their breakfast usually consists of soft maize porridge (mealie-meal or fermented sorghum) with sugar and/or milk, bread and tea or coffee. Their lunch is usually light mealie-meal pap (porridge) again or it can be bread. They usually cook for the evenings because all the family members are home. Their dish usually consists of large portions of carbohydrates, vegetables like tomatoes and onions (soup) and animal products like meat or eggs (researcher's self observation as she is Tswana speaking and resides in the village)

2.3.3 Eating patterns

(this was an observation from the elderly and also how the researcher grew up, there was no particular reference)

2.3.3.1 Staple food

- **Maize**
  The Tswana staple food is maize (mealie-meal). Maize is prepared and served in a variety of ways.

- **Green mealies**
  Method of cooking: Remove the outer leaves, boil with enough water, for about 45 minutes and serve. Some of people prefer it with salt and/or butter.

- **Dry mealie seeds (Kabu)**

  Method of cooking: Remove the dry seeds from the cob and put to boil with enough water. The outer skins of the kernels rapture during cooking and are then tender and soft, ready to be eaten.

- **Samp**

  Samp can be cooked with or without beans. Samp and beans are soaked overnight to shorten the cooking time. The water is drained the following day and fresh water is added and brought to boil. Add water during boiling if needed. After cooking, the samp will be double the volume, as would be the case with rice. Salt can be added, also a little fat and some curry soup.

- **Porridges**

  Porridge is the favourite food in the traditional black cuisine (style of cooking of Southern Africa). The basic ingredient of porridge is ground grain, sorghum is also used in porridge, but mealie-meal (maize) porridge is the most popular. Porridge could be prepared in different consistencies, e.g. (i) Soft porridge. Method of cooking: Bring the water to boil, add cold water to the mealie-meal in a dish and stir, add the mixture to the boiling water and stir constantly and serve with sugar and/or milk. This dish is usually eaten as breakfast. (ii) Thick porridge. Method of cooking: Bring water to boil in a pot, add mealie-meal directly to the boiling water, add a little bit of salt, stir, cook slowly and stir in between. Thick porridge (pap) can be served with "seshabo" (gravy with meat or vegetables like spinach or cabbage). It is usually served in the evening or during lunch.

  Fermented porridges which are either sorghum or mealie-meal are also available and are commonly known as sour porridges. These are cooked in the same way as thick or soft porridge except that one needs to ferment it first by stirring the sorghum or maize into lukewarm water and leaving it for 2 days to become sour or to be fermented.

- **Dumplings**

  Dumplings are served by way of a change instead of porridge. Dumplings are prepared from flour. Flour is used to make dumplings, fat cakes, bread, biscuits and

cakes. Method of cooking: Add yeast (dry instant yeast) to the flour, salt (a pinch) and a little bit of sugar. Add lukewarm water and mix using the hands. Leave it for a couple of minutes until it rises. To cook place the dumpling into a dish, dropped into a pot containing boiling water and cook. Serve dumplings with vegetable soup or stew. For fat cakes, the dough should be soft and rolled into separate ball shaped portions. These balls must be placed in pre-heated oil, hot enough to let them cook. They also use the dough/flour to bake "dikgaragana" that are like scones, but consist of flour, yeast and water only (no eggs). These are usually roasted outside over an open fire (direct heat).

2.3.3.2 Vegetables and fruits

Wild green leaves are gathered from the veld and cooked the same way as cooking spinach. These leaves are called "morogo wa thepe", it makes a good substitute for spinach. It is a favourite dish for the Tswana and it costs nothing. They also like "morogo" very much because they have been told that it is rich in vitamin A, which is very good for a person's body.

The most popular cultivated trees are peaches, lemon, grapes and apricot. But not all participants have fruit trees or wild fruit to rely on. In poverty stricken areas fruit consumption is lower, except where there are cultivated trees in the vicinity of the household.

2.3.3.3 Animal products

Traditionally it is a symbol of wealth to possess cattle, goats, sheep and chickens. These animals are, however, mainly kept for feeding purposes or for special ceremonial occasions. Cattle are also used to pay "lobola". Men prefer meat rather than any other "seshabo". Animal products include products like eggs, milk and affal (intestine, liver and lungs of an animal).

2.3.3.4 Beverages

Beverages include homemade beer called "chibuku" (sold at the brewery) and local beer brands like Castle Lager and Black Label (considered a bit expensive for frequent use). There are different kinds of homemade beers, e.g. (i) A mixture of sorghum, grain and water, which has to stand for approximately three (3) days for fermentation to take place before it is ready to drink. (ii) A mixture of bread, yeast and pineapple. This method is now being discouraged because it is said to cause certain diseases, e.g. asthma.

CHAPTER 3: METHODOLOGY

3.1 Introduction

The study assessed the effectiveness of Food-Based Dietary Guidelines (FBDG) as nutrition education tool as well as the appropriateness for the Tswana by using focus group methodology. The general methodology will be discussed in this chapter.

3.2 Populations and samples

In the Transition and Health during Urbanization of South African (THUSA) study, it was found that the nutritional status of people from different strata differs. People living on farms had the worst nutritional, physical and psychological health status followed by people living in urban-informal settlements (Vorster *et al*, 2001). In this study it was decided to use only four different strata namely rural, urban-formal, urban-informal and farms to investigate the effectiveness of the FBDG as a nutrition education tool. Efforts were made to determine whether there would be any limitations in using the existing guidelines among Tswana, Tsonga and Pondo communities. This mini-dissertation reflects the findings among Tswana people living in the four (4) different strata in the Rustenburg area.

3.3 Description of the participants per strata

Participants were recruited through messages spread at the local health clinics to all women who were interested and were told to come to the health clinic to complete the individual pre-test questionnaire. It was a convenient sample and everyone who turned up were included. The Inclusion criteria were:

- females,
- who were responsible for buying and preparing food in their households,
- and voluntarily wanted to take part in the study.

Groups consisted of more or less eight (8) women per group. The health clinic allocated a boardroom for the focus group discussion.

3.3.1 Rural

Participants from the two (2) rural areas were residing in the Koster area. It is a local authority area with a municipal counsellor. Their homes were made of cement blocks and corrugated iron roofs, others out of mud with thatched roofs and others were all corrugated iron for both the roofs and the walls. Most of them used firewood and paraffin as a source of energy.

3.3.2 Farms

Participants were residing on farms near a farm school. Two (2) focus groups were held on two (2) farms (50km apart from each other). They are both situated in the Swartruggens district. The other farm was closer to a mining area. Their homes were mostly characterised by muddy walls with thatched roofs. These farms are about sixty (60) kilometres away from Swartruggens. Their homes are far apart from each other, one's closest neighbour being about five (5) kilometres away.

The message was spread at the nearest school. Women were informed of the project during a school meeting and a date was set to meet those who showed interest.

3.3.3 Urban-formal

Participants of the two (2) urban-formal focus groups were residing in Mfidikwe and Marikana. These areas are still under tribal laws. Two (2) focus group interventions, held in these areas consisted of eight (8) participants each. The participants had part-time occupations and were recruited from the local clinic. They were women who conducted counselling and health education at the local clinic on HIV/AIDS.

3.3.4 Urban-informal

Participants were residing in a place known as Number 8 and were closer to a mining area. Their homes were made of corrugated iron for both the roofs and the walls, the common name attached to these kinds of areas is "squatter camps" or informal settlements. Only seven (7) participants volunteered to participate and therefore only one

(1) focus group was formed. The message was spread at the local clinic, and the date was set with those who were interested. The clinic was used as a venue to conduct the focus group discussion.

3.4 Measuring instruments

A questionnaire was developed for demographic information and another for measuring the knowledge and practices of women responsible for buying and preparing food in their homes. These questionnaires (Annexure B & D) was based on the FBDG and used as a baseline and post-intervention instrument. The questionnaire was structured in a "Yes, No or Don't know" responses. Questions were formulated around each guideline. It was pre-tested amongst five (5) individuals. The questionnaires as well as the guidelines (Annexure A) were translated into the Setswana language.

3.5 Intervention

After participants agreed to participate voluntarily, five (5) days were utilised in each area for organising focus group discussions and conducting the baseline questionnaire.

Nearby schools and clinics were used as venues for interviews and conducting focus group sessions. The focus group participants sat around the table together with the researcher and field assistant (to help taking notes) with training materials e.g. food pictures which were used to demonstrate the kinds of food one can get in each guideline. A tape recorder was also used. The researcher did ask for permission from all the participants to record all that were said. It was also mentioned to participants that after the transcripts were made, these tapes will be erased and that they have no reason to feel intimidated by the tape recorder. The starting time for all the groups was based on the agreement with participants. The duration of the session was approximately 2 (two) hours depending on the discussions.

The purpose of the meeting was discussed. Participants introduced themselves and gave a brief background on themselves. The focus group facilitator (the researcher) discussed the FBDG (Annexure C) followed by a discussion by the participants led by questions on what they remembered and why.

The discussion guide was developed focusing on each guideline. It was to find out if the participants heard the message before, what is the meaning thereof, and did they implement it in every day's eating, if not what were the constraints. Some of the questions in the topic guide were structured in a "Yes" or "No" response for example "Do you and your family enjoy variety of foods?" If "Yes", "how do you do this?" and if "No", "why do you say this?"

When using the food pictures, the researcher asked questions like "What vegetables do you and your family eat at home?" In order to introduce other varieties of vegetables to the participants, pictures of the vegetables that were not mentioned, were also flashed by the researcher.

Some of the participants we quiet during focus group discussions, the researcher involved them by asking questions directly to these participants, their names were displayed on the table in front of them.

Then the session was summarised by the group. The researcher conducted the post-intervention questionnaire three to four (3-4) weeks after the focus group discussions to assess the knowledge improvement and practices.

3.6 Focus group methodology

According to Krueger *et al.* (2000) focus group interviews have five (5) characteristics or features that relate to the ingredients of a focus group: (i) people who (ii) posses certain characteristics and (iii) provide quality data (iv) in a focus discussion (v) to help understand the topic of interest. Other types of focus processes used in human service may also have one or more of these features but not in the same combination as focus group interviews.

The researcher followed the guidelines for conducting focus groups as suggested by Krueger *et al.* (2000). The following aspects were taken into consideration:

- A focus group discussion allows for an opportunity to listen to and gather information from participants. It is a way to a better understanding of how people feel or think about an issue, product or service.

- Participants are selected because they have certain characteristics in common that relate to the topic of the focus group.

- The researcher creates a permissive environment in the focus group to encourage participants to share perceptions and points of view. Voting in order to reach consensus is eliminated and this contributes to a comfortable and more relaxed atmosphere.

According to Krueger *et al.* (2000), the goal of a focus group discussion is to collect data that are of interest to the researcher and typically to find the range of opinions of people across several groups with a predetermined purpose in mind. In this study, the researcher compared data collected from focus groups to identify similarities and differences. Participatory research places emphasis on involving people in a community in conducting the research, because of what the process does for that community in terms of developing commitment and improving applicability.

3.7 Post-intervention

The same questionnaire, as was used for baseline purposes was again used for the collecting of post-intervention information. It was conducted three to four (3-4) weeks after the focus group sessions, to assess the impact of the intervention.

3.8 Analysis of the data

The data were analysed with the help of the Statistical Consultation Services of the North-West University (Potchefstroom campus). The Statistical Analysis System (SAS) Institute Inc., 2005, Version 9.1 was used. The questionnaires were computerised. Descriptive statistical analysis and frequency tables of the demographic data were done. The *t*-test was applied to calculate the difference in the beginning and end knowledge. Effect size (*d*-value) was then calculated to establish whether there was a change in

knowledge of the participants that was of any practical significance (SAS Institute Inc., 2005).

Paired sample *t*-tests were used to determine whether the results within groups were statistically significant. Statistical significance does not necessarily imply that the results are important in practice. The effect size (*d*-value) is a measure of practical significance and is independent of the sample size (Steyn, 2000).

The *d*-value is calculated by using the following formula:

$$d = \frac{x \text{ diff}}{s \text{ diff}}$$

Where *x* diff is the mean increase in knowledge and *s* diff is the standard deviation of the increase in knowledge

Cohen (1998) gives the following guidelines for interpretation of the effect size (*d*):

d = 0.2 small effect and of no practical importance;
d = 0.5 medium effect that might be of practical importance; and
d = 0.8 large effect that is of importance in practice.

3.9 Reliability of the knowledge and practice questionnaire

Exploratory factor analysis was applied to determine correlation between different factors in order to ensure construct validity. Cronbach co-efficient alpha was calculated to determine the reliability of the results. Cronbach co-efficient alpha is a measure of internal consistency. A value of 0.5 for Cronbach co-efficient alpha is regarded as acceptable. The questionnaires used in this study scored a Cronbach co-efficient alpha value of 0.76 and it is assumed that the data can be regarded as reliable (SAS institute Inc., 2005).

3.10 Ethical considerations

The study was approved by the Ethics Committee of the Potchefstroom University for Christian Higher Education. All participants were fully informed about the objectives and procedures of the study. Their home language was used for doing so. All the participants gave their consent and voluntarily participated in the study.

3.11 Study limitations

For each stratum the researcher planned to have two (2) focus group discussions with more or less eight (8) participants each. At the end only one (1) focus group discussion with seven (7) women from the urban-informal group was conducted. The rest of the participants did not keep the appointment even after rescheduling. Therefore the results from the urban-informal group are based only on the seven (7) women, which is fifty percent (50%) less than all other strata.

CHAPTER 4: RESULTS

4.1 Introduction

In this chapter, all results on the demographic information are given. Results of the focus group discussions are given and explained together with the pre- and post-intervention questionnaire per Food-Based Dietary Guideline (FBDG).

4.2 Demographic profile for different strata

The population sample comprised of fifty (50) participants of which twelve (12) were from rural, sixteen (16) from urban-formal, seven (7) from urban-informal and fifteen (15) from the farm area.

Table 4.1: Age distributions of subjects

Question 2 How old are you?	Stratum	Number of subjects per age group					
		10-20yrs	21-30yrs	31-40yrs	41-50yrs	51-60yrs	61yrs & older
	Rural n=12 24%	-	7=58%	3=25%	0=0%	2=17%	0=0%
	Formal n=16 32%	-	2=13%	9=56%	4=25%	0=0%	1=6%
	Informal n=7 14%	-	1=14%	5=72%	1=14%	0=0%	0=0%
	Farm n=15 30%	-	7=47%	1=7%	1=7%	2=13%	4=27%
Total	**n= 50 100%**	**-**	**17=34%**	**18=36%**	**6=12%**	**4=8%**	**5=10%**

Table 4.1 indicates that there were no participants in all the strata between 10-20 years of age.

In the rural group, the majority of participants (58%) were between 21- 30 years of age. None was between 41-50 years or 61 and older.

In the urban-formal group, the majority fell in the age group 31-40 years (56%) and none in the group of 51-60 years of age.

In the urban-informal the majority of participants (72%) were between 31-40 years of age. None was between 51-60 years or 61 and older.

Table 4.2 Level of education per household

Question 3 What is your education level?	**Stratum**	**Number of subjects per level of education**				
		Grade R-3	**Grade 4-6**	**Grade 7-9**	**Grade 10-12**	**Grade 12 & higher**
	Rural n=12 24%	0= 0%	0=0%	0=0%	12=100%	0=0%
	Formal n=16 32%	2=13%	0=0%	4=25%	10=62%	0=0%
	Informal n=7 14%	0=0%	0=0%	3=43%	4=57%	0=0%
	Farm n=15 30%	7=47%	2=13%	4=27%	2=13%	0=0%
Total	**n= 50 100%**	**9=18%**	**2=4%**	**11=22%**	**28=56%**	**0=0.0%**

According to Table 4.2, no participants had an education level higher than Grade 12 (Matric). The rural and the urban-formal participants in the study accounted for 100% and 62% respectively in the level Grades 10-12. The lowest education level was between Grade R-3 of which the majority group came from the farm area at 47%.

Table 4.3a: Family composition per household (number of people in a family)

Question 4 How many family members are staying in your household (including yourself)?	Stratum	Number of people in a family and the % thereof			
		2 members	3-5 members	6-8 members	8 members or more
	Rural n=12 24%	0=0%	4=33%	8=67%	0=0%
	Formal n=16 32%	0=0%	12=75%	4=25 %	0=0%
	Informal n=7 14%	1=14%	6=86%	0=0%	0=0%
	Farm n=15 30%	0=0%	2=13%	10=67%	3=20%
Total	**n=50 100%**	**1=2%**	**24=48%**	**22=44%**	**3=6%**

Most participants from the urban-formal (75%) and urban-informal (86%) reported 3-5 members in the families, while both participants from the rural and farm (67%) reported between 6-8 family members.

Table 4.3b: Family compositions per household (number of children cooked for)

Question 5c For how many Children do you cook daily?	Stratum	Number of children cooked for daily						
		1	2	3	4	5	6	7
	Rural n=12	-	3=25%	1=8%	2=17%	6=50%	-	-
	Formal n=16	3=19%	5=31%	4=25%	1=6%	1=6%	2=13%	-
	Informal n=6 1 missing	1=17%	3=50%	2=33%	-	-	-	-
	Farm n=14 1 missing	2=14%	-	-	2=14%	3=21%	4=29%	3=21%
Total		**n=6**	**n=11**	**n=7**	**n=5**	**n=10**	**n=6**	**n=3**

The majority of the participants in three (3) strata cooked for two (2) children, with percentages that ranged from 25% for rural, 31% for urban-formal and 50% for urban-informal.

Table 4.4: Employment status per household

Question 6 What is your Unemployment Status?	Stratum	Number of subject unemployed	Number of subject employed part-time	Number of Subjects employed full-time
	Rural n=12 24%	12=100%	0=0%	-
	Formal n=16 32%	0=0%	16=100%	-
	Informal n=7 14%	7=100%	0=0%	-
	Farm n=15 30%	15=100%	0=0%	-
Total	**n=50 100%**	**n=34 68%**	**n=16 32%**	-

The highest unemployment rate was amongst the rural, urban-informal and farm participants with a percentage of 100%. The formal area participants had the highest rate of employment on part-time basis at 100%. There were no participants, across all the strata that were employed full-time.

Table 4.5: Income per household

Question 7 What is your own Income?	Stratum	Number of people who earn own income per household						
		None	R 1-R100	R101-R500	R501-R1000	R1001-R2000	R2001-R3000	R3001& more
	Rural n=12 24%	12=100%	0=0%	0=0%	-	-	-	-
	Formal n=16 32%	0=0%	0=0%	16=100%	-	-	-	-
	Informal n=7 14%	7=100%	0=0%	0=0%	-	-	-	-
	Farm n=15 30%	12=80%	1=7%	2=13%	-	-	-	-
Total	**n=50 100%**	**n =31**	**n=1**	**n=18**	-	-	-	-

The group with the highest earnings were participants from the urban-formal at 100% between the wages of R101-R500. The rural, urban-informal and farm participants were the highest with no income at both 100% and 80%.

4.3 The intervention study: analysis of knowledge questionnaire

In this section the knowledge questionnaire for pre- and post-intervention related to the eleven (11) FBDG per stratum was analyzed. Interesting aspects of the individual questions were also highlighted.

4.3.1 FBDG: "Enjoy a variety of foods"

Table 4.6: Baseline and end knowledge per stratum for the FBDG "Enjoy a variety of foods"

	Possible Answers	Rural n=12		Formal n=16		Informal n=7		Farm n=15	
		before	**after**	**before**	**after**	**before**	**after**	**before**	**after**
Question 13 I think that healthy food will help me not to get sick so easily	True	n=12 100%	n=12 100%	n=16 100%	n=16 100%	n=7 100%	n=7 100%	n=15 100%	n=15 100%
	False	n=0	n=0	n=0	n=0	n=0	n=0	n=0	n=0
Question 18 Our daily diet should include a lot of different food	True	n=12 100%	n=12 100%	n=16 100%	n=16 100%	n=7 100%	n=7 100%	n=12 80%	n=12 80%
	False	n=0	n=0	n=0	n=0	n=0	n=0	n=3 20%	n=3 20%
Question 25 I don't care what I give my family to eat as long as they get their stomachs full	True	n=6 50%	n=0	n=1 6%	n=1 6%	n=1 14%	n=0	n=4 27%	n=3 20%
	False	n=6 50%	n=12 100%	n=15 94%	n=15 94%	n=6 86%	n=7 100%	n=11 73%	n=12 80%
Question 34 Our daily diet should include vegetables & starch only	True	n=12 100%	n=12 100%	n=16 100%	n=16 100%	n=7 100%	n=7 100%	n=15 100%	n=15 100%
	False	n=0	n=0	n=0	n=0	n=0	n=0	n=0	n=0
Question 40 I only buy food that is cheap	True	n=0	n=0	n=0	n=0	n=0	n=0	n=1 7%	n=1 7%
	False	n=12 100%	n=12 100%	n=16 100%	n=16 100%	n=7 100%	n=7 100%	n=14 93%	n=14 93%
Question 49 Our daily diet should include foods of one type e.g. starchy foods only	True	n=0	n=0	n=0	n=0	n=0	n=0	n=2 13%	n=2 13%
	False	n=12 100%	n=12 100%	n=16 100%	n=16 100%	n=7 100%	n=7 100%	n=13 87%	n=13 87%

Percentage with the symbol # had a medium size difference of practical importance ($d \geq 0.5$ and < 0.8)

Percentage with the symbol * had a large difference of practical importance ($d \geq 0.8$)

From Table 4.6, it becomes clear that the knowledge of all participants in all strata was good in terms on this FBDG. In Question 25, 50% of the rural participants agreed before the intervention that they did not care what they gave their families to eat as long as they

got their stomachs full. After the intervention, in the rural stratum in Question 25, which says, "I don't care what I give my family to eat as long as they get their stomachs full", all participants agreed that there is more to eating than merely filling a stomach. There was an increase in knowledge that was of practical significance (d=0.96).

From the focus group discussion, participants cited that it was difficult to eat different kinds of food every day although they mentioned again that it was important to eat different foods to keep the body healthy. They believed that eating different foods would help them to prevent or minimise certain diseases.

4.3.2 FBDG: "Be active"

Table 4.7: Baseline and end knowledge per stratum for the FBDG "Be active"

	Possible Answers	Rural n=12		Formal n=16		Informal n=7		Farm n=15	
		before	after	before	after	before	after	before	after
Question 16 It is healthy to be physically active	True	n=12 100%	n=12 100%	n=16 100%	n=16 100%	n=7 100%	n=7 100%	n=15 100%	n=15 100%
	False	n=0	n=0	n=0	n=0	n=0	n=0	n=0	n=0
Question 20 Being active has nothing to do with being healthy	True	n=3 25%	n=2 17%	n=1 6%	n=1 6%	n=1 14%	n=1 14%	n=5 33%	n=4 27%
	False	n=9 75%	n=10 83%	n=15 94%	n=15 94%	n=6 86%	n=6 86%	n=10 67%	n=11 73%

Percentage with the symbol # had a medium size difference of practical importance ($d \geq 0.5$ and < 0.8)

Percentage with the symbol * had a large difference of practical importance ($d \geq 0.8$)

There was no practical significant knowledge gain as participants agreed before and after that it was healthy to be physically active, as indicated in Table 4.7. There was some confusion in terms of Question 20, which says "Being active has nothing to do with being healthy". Participants interpreted the message during the focus group discussion as exercising the body by going to the gym or running. They did not associate the message with any of the household chores performed by them on a regular basis, e.g. sweeping, dusting, doing the washing and dishes, carrying things and preparing meals.

From the focus group discussion it also became clear that all participants felt that it was important to be active because it helped to curb the occurrence of illness. They also associated the message with losing weight.

4.3.3 FBDG: "Make starchy food the basis of most meals"

Table 4.8: Baseline and end knowledge per stratum for the FBDG "Make starchy food the basis of most meals"

	Possible Answers	Rural n=12		Formal n=16		Informal n=7		Farm n=15	
		before	**after**	**before**	**after**	**before**	**after**	**before**	**after**
Question 2 I like giving my family just pap	True	n=0	n=0	n=1 6%	n=1 6%	n=1 14%	n=1 14%	n=0	n=0
	False	n=12 100%	n=12 100%	n=15 94%	n=15 94%	n=6 86%	n=6 86%	n=15 100%	n=15 100%
Question 5 You need food such as bread with every meal because it gives you energy for the day	True	n=10 83%	n=12 100%	n=12 75%	n=16 100%	n=3 43%	n=4 57	n=3 20%	n=9 60%
	False	n=2 17%	n=0	n=4 25%	n=0	n=4 57%	n=3 43%	n=12 80%	n=6 40%
Question 21 I prefer to eat white bread even though brown bread is healthier	True	n=12 100%	n=12 100%	n=16 100%	n=16 100%	n=4 57%	n=4 57%	n=12 80%	n=12 80%
	False	n=0	n=0	n=0	n=0	n=3 43%	n=3 43%	n=3 20%	n=3 20%
Question 48 Starchy foods will supply energy to the body	True	n=12 100%	n=12 100%	n=15 94%	n=16 100%	n=5 71%	n=5 71%	n=3 20%	n=7 47%
	False	n=0	n=0	n=1 6%	n=0	n=2 29%	n=2 29%	n=12 80%	n=8 53%
Question 54 Starchy food should fill a large portion of my plate	True	n=6 50%	n=0	n=7 44%	n=6 37%	n=1 14%	n=0	n=6 40%	n=3 20%
	False	n=6 50%	n=12 100%	n=9 56%	n=10 63%	n=6 86%	n=7 100%	n=9 60%	n=12 80%

Percentage with the symbol # had a medium size difference of practical importance (d ≥ 0.5 and < 0.8)

Percentage with the symbol * had a large difference of practical importance (d ≥ 0.8)

Table 4.8 indicates a practical significant increase in knowledge with a *d*-value of 0.78881, in Question 5, for the farm participants. In Question 58, 50% of rural participants agreed that starchy food should fill a large portion of the plate. There was a *d*-value of 0.95743 after the intervention, which is of high practical significance.

The results from the focus group discussion indicated that the general understanding and interpretation of the majority of participants can be summarised as follows:

- Urban and rural participants' concerns were that the eating of too much starch caused gain in weight.

- Farm participants did not understand the meaning of "steisele" which means starch in English.

- Rural and farm participants mentioned cabbage as starchy food.

- Participants were consuming more mealie-meal (maize) than other starchy foods.

- Participants were actually implementing this guideline although they thought it was wrong to do so. Their practice was that, they would eat soft porridge in the morning, bread for lunch and mealie-meal (maize) porridge (pap) for supper.

4.3.4 FBDG: "Eat plenty of vegetables and fruits every day"

Table 4.9: Baseline and end knowledge per stratum for the FBDG "Eat plenty of vegetables and fruits every day"

	Possible Answers	Rural n=12		Formal n=16		Informal n=7		Farm n=15	
		before	**after**	**before**	**after**	**before**	**after**	**before**	**after**
Question 9 A healthy diet should include a lot of vegetables and fruits daily	True	n=12 100%	n=12 100%	n=16 100%	n=16 100%	n=7 100%	n=7 100%	n=15 100%	n=15 100%
	False	n=0	n=0	n=0	n=0	n=0	n=0	n=0	n=0
Question 11 When boiling green vegetables, bicarbonate of soda must be added.	True	n=0	n=0	n=0	n=0	n=0	n=0	n=1 7%	n=0
	False	n=12 100%	n=12 100%	n=16 100%	n=16 100%	n=7 100%	n=7 100%	n=14 93%	n=15 100%
Question 19 Tomatoes are rich in proteins, they can be used instead of meat	True	n=0	n=0	n=0	n=0	n=0	n=0	n=2 13%	n=1 7%
	False	n=12 100%	n=12 100%	n=16 100%	n=16 100%	n=7 100%	n=7 100%	n=13 87%	n=14 93%
Question 23 Vegetables should be cooked in a little water for a short time	True	n=6 50%	n=9 75%	n=10 62%	n=11 69%	n=4 57%	n=4 57%	n=3 20%	n=8 53%
	False	n=6 50%	n=3 25%	n=6 38%	n=5 31%	n=3 43%	n=3 43%	n=12 80%	n=7 47%
Question 35 Vegetables cooked in just a little water will protect against illness better than cooked in a lot of water	True	n=8 67%	n=9 75%	n=10 62%	n=11 69%	n=5 71%	n=4 57%	n=4 27%	n=10 67%
	False	n=4 33%	n=3 25%	n=6 38%	n=5 31%	n=2 29%	n=3 43%	n=11 73%	n=5 33%
Question 41 Fruits & vegetables will help protect the body	True	n=12 100%	n=12 100%	n=16 100%	n=16 100%	n=7 100%	n=7 100%	n=15 100%	n=15 100%
	False	n=0	n=0	n=0	n=0	n=0	n=0	n=0	n=0
Question 43 Drinking a lot of fruit juice is harmful to your body	True	n=0	n=0	n=0	n=0	n=0	n=0	n=1 7%	n=1 7%
	False	n=12 100%	n=12 100%	n=16 100%	n=16 100%	n=7 100%	n=7 100%	n=14 93%	n=14 93%
Question 46 Vegetables must be cooked in a lot of water for a long time	True	n=4 33%	n=3 25%	n=6 38%	n=5 31%	n=3 43%	n=3 43%	n=12 80%	n=7 47%
	False	n=8 67%	n=9 75%	n=10 62%	n=11 69%	n=4 57%	n=4 57%	n=3 20%	n=8 53%
Question 50 Vegetables help protect my body against illness	True	n=12 100%	n=12 100%	n=16 100%	n=16 100%	n=7 100%	n=7 100%	n=15 100%	n=15 100%
	False	n=0	n=0	n=0	n=0	n=0	n=0	n=0	n=0
Question 52 Cooked vegetables must be left lying in water after they have been cooked	True	n=2 17%	n=1 8%	n=0	n=0	n=0	n=0	n=2 13%	n=1 7%
	False	n=10 83%	n=11 92%	n=16 100%	n=16 100%	n=7 100%	n=7 100%	n=13 87%	n=14 93%

Percentage with the symbol # had a medium size difference of practical importance (d ≥ 0.5 and < 0.8)

Percentage with the symbol * had a large difference of practical importance (d ≥ 0.8)

Table 4.9 show that all participants agreed that a healthy diet should include a variety of vegetables and fruits daily. Most participants did not agree with the statement, which said "when boiling green vegetables, bicarbonate of soda must be added", except for 7% of the participants mainly from farm areas. However, after the intervention there was a knowledge increase and 100% of the participants disagreed significantly. Before the intervention, farm participants did agree with the statement "tomatoes are rich in protein and can be used instead of meat". There was an increase in knowledge (d=0.2) which is practically insignificant.

In Question 23, there was an increase in knowledge for the rural, formal and farm participants while the informal participants remained at the same level.

With regard to Question 35 there was a practically significant increase in knowledge among participants from the farm areas. Before the intervention 73% did not agree that vegetables cooked in just a little water would have a better chance of protecting against illness than vegetables cooked in a lot of water and after the intervention only 33% still held this opinion (d=0.79).

All participants understood that vegetables and fruits would help protect the body. In Question 43, only 7% (one subject) agreed that drinking to much fruit juice is harmful to the body. There was an increase in knowledge with regard to Question 46, except in the case of the informal participants where the knowledge remained at the same level.

From the focus group discussion, participants said that it was important to eat vegetables and fruits because they built the body and muscles, vegetables protected against illness and also enhanced good health. Participants also mentioned that when they cooked vegetables, they added ample amounts of water and sometimes they poured down the water when they noticed that the cooking had been sufficient.

4.3.5 FBDG: "Eat dry beans, peas, lentils and soya beans regularly"

Table 4.10: Baseline and end knowledge per stratum for the FBDG "Eat dry beans, peas, lentils and soya beans regularly"

	Possible Answers	Rural n=12		Formal n=16		Informal n=7		Farm n=15	
		before	**after**	**before**	**after**	**before**	**after**	**before**	**after**
Question 14 Soy beans are rich in protein	True	n=9 75%	n=12 100%	n=16 100%	n=16 100%	n=6 86%	n=7 100%	n=11 73%	n=14 93%
	False	n=3 25%	n=0	n=0	n=0	n=1 14%	n=0	n=4 27%	n=1 7%
Question 28 Dried beans should not be eaten more than once a week	True	n=3 25%	n=3 25%	n=9 56%	n=3 19%	n=3 43%	n=3 43%	n=1 7%	n=1 7%
	False	n=9 75%	n=9 75%	n=7 44%	n=13 81%	n=4 57%	n=4 57%	n=14 93%	n=14 93%
Question 31 Dried beans can be use instead of meat	True	n=2 17%	n=4 33%	n=3 19%	n=1 6%	n=2 29%	n=2 29%	n=14 93%	n=7 47%
	False	n=10 83%	n=8 67%	n=13 81%	n=15 94%	n=5 71%	n=5 71%	n=1 7%	n=8 53%
Question 37 Dried beans are a cheap alternative for meat	True	n=12 100%	n=12 100%	n=16 100%	n=16 100%	n=7 100%	n=7 100%	n=15 100%	n=15 100%
	False	n=0	n=0	n=0	n=0	n=0	n=0	n=0	n=0
Question 47 Dried beans are just as healthy for the body as meat	True	n=9 75%	n=8 67%	n=13 81%	n=15 94%	n=5 71%	n=5 71%	n=2 13%	n=8 53%
	False	n=3 25%	n=4 33%	n=3 19%	n=1 6%	n=2 29%	n=2 29%	n=13 87%	n=7 47%

Percentage with the symbol # had a medium size difference of practical importance (d ≥ 0.5 and < 0.8)

Percentage with the symbol * had a large difference of practical importance (d ≥ 0.8)

From Table 4.10, it is clear that before the intervention 93% of participants agreed that dried beans could be used instead of meat (Question 31). After the intervention, 47% agreed that dried beans could be used instead of meat, while 53% disagreed. This showed a decrease in knowledge with a *d*-value of 0.90370. This could mean that participants did not understand the guideline.

The majority of participants understood that soya beans were rich in protein and showed insignificant knowledge gain (d=0.2). All participants agreed that dried beans could serve as a cheap alternative for meat. There was an increase in knowledge in formal, informal and farm participants with regard to Question 47, except in the case of the rural groups where there was a decrease in knowledge.

The results from the focus group discussions indicated that the general understanding and interpretation of the majority can be summarised as follows:

- Eating dry beans, peas, lentils and soya everyday.

- Soya beans are rich in protein.

- Beans are not nutritious because they are inexpensive and easily available (farm participants).

- It is important to eat beans and soya (rural and urban participants).

In terms of their practice, they are used to eating beans with samp and in winter they usually prepare soup beans.

4.3.6 FBDG: "Chicken, fish, meat, milk and eggs could be eaten daily"

Table 4.11: Baseline and end knowledge per stratum for the FBDG "Chicken, fish, meat, milk and eggs could be eaten daily"

	Possible Answers	Rural n=12		Formal n=16		Informal n=7		Farm n=15	
		before	**after**	**before**	**after**	**before**	**after**	**before**	**after**
Question 8 A healthy diet should include chicken, meat, eggs & cheese in large quantities daily	True	n=12 100%	n=12 100%	n=12 75%	n=12 75%	n=7 100%	n=4 57%	n=14 93%	n=14 93%
	False	n=0	n=0	n=4 25%	n=4 25%	n=0	n=3 43%	n=1 7%	n=1 7%
Question 17 Red meat is healthier than chicken	True	n=1 8%	n=3 25%	n=1 6%	n=4 25%	n=2 29%	n=3 43%	n=5 33%	n=2 13%
	False	n=11 92%	n=9 75%	n=11 94%	n=12 75%	n=5 71%	n=4 57%	n=10 67%	n=13 87%
Question 22 As a grown up, I do not need to drink milk everyday	True	n=1 8%	n=0	n=10 63%	n=1 6%	n=5 71%	n=0	n=0	n=0
	False	n=11 92%	n=12 100%	n=6 37%	n=15 94%	n=2 29%	n=7 100%	n=15 100%	n=15 100%
Question 27 Meat, fish, chicken & milk are a good source of protein	True	n=9 75%	n=10 83%	n=13 81%	n=16 100%	n=6 86%	n=6 86%	n=1 7%	n=7 47%
	False	n=3 25%	n=2 17%	n=3 19%	n=0	n=1 14%	n=1 14%	n=14 93%	n=8 53%
Question 29 Eating eggs is just as good as eating meat	True	n=2 17%	n=0	n=15 94%	n=7 44%	n=0	n=0	n=10 67%	n=8 53%
	False	n=10 83%	n=12 100%	n=1 6%	n=9 56%	n=7 100%	n=7 100%	n=5 33%	n=7 47%
Question 39 I rather eat meat than cheese because meat is healthier than cheese	True	n=1 8%	n=0	n=0	n=2 12%	n=2 29%	n=3 43%	n=4 27%	n=4 27%
	False	n=9 92%	n=12 100%	n=16 100%	n=14 88%	n=5 71%	n=4 57%	n=11 73%	n=11 73%

Percentage with the symbol # had a medium size difference of practical importance (d ≥ 0.5 and < 0.8)

Percentage with the symbol * had a large difference of practical importance (d≥ 0. 8)

Table 4.11 shows that, before the intervention 63% of the urban-informal participants agreed with the statement, which says that as grown up, they do not have to drink milk every day (Question 22). After the intervention 94% disagreed with the question, meaning that there was an increase in knowledge, which was of high practical significance (*d*=1.097). In Question 29, 94% of urban-formal participants agreed that eating eggs is just as good as eating meat. After the intervention 44% agreed, with a *d*-value of 0.968 that is of practical significance. It shows an increase in knowledge.

The results from the focus group discussions indicated that participants interpreted the message as:

- It is important to eat chicken, fish, meat, milk and eggs daily.
- These products assist in building the body and making it strong.
- They mentioned that the message was very simple because all the food products were included in the message.
- One of the barriers for not implementing this message was affordability; eggs were the most affordable, because they were eating eggs on a regular basis.

4.3.7 FBDG: "Use sugar and sugar-containing food and drinks in moderation"

Table 4.12: Baseline and end knowledge per stratum for the FBDG "Use sugar and sugar-containing food and drinks in moderation"

	Possible Answers	Rural n=12		Formal n=16		Informal n=7		Farm n=15	
		before	**after**	**before**	**after**	**before**	**after**	**before**	**after**
Question 3 It is good to drink a lot of soft drinks daily	True	n=2 17%	n=1 8%	n=3 19%	n=3 19%	n=0	n=0	n=9 60%	n=7 47%
	False	n=10 83%	n=11 92%	n=13 81%	n=13 81%	n=7 100%	n=7 100%	n=6 40%	n=8 53%
Question 24 Eating a lot of food rich in sugar daily will cause bad teeth	True	n=12 100%	n=12 100%	n=16 100%	n=16 100%	n=7 100%	n=7 100%	n=15 100%	n=15 100%
	False	n=0	n=0	n=0	n=0	n=0	n=0	n=0	n=0
Question 36 Brown sugar is better than white sugar	True	n=12 100%	n=12 100%	n=16 100%	n=16 100%	n=7 100%	n=7 100%	n=12 80%	n=13 87%
	False	n=0	n=0	n=0	n=0	n=0	n=0	n=3 20%	n=2 13%
Question 44 A healthier diet should include many foods containing a lot of sugar	True	n=0	n=0	n=0	n=0	n=0	n=0	n=1 7%	n=1 7%
	False	n=12 100%	n=12 100%	n=16 100%	n=16 100%	n=7 100%	n=7 100%	n=14 93%	n=14 93%
Question 55 It is healthier to eat an apple instead of sweets	True	n=12 100%	n=12 100%	n=16 100%	n=16 100%	n=7 100%	n=7 100%	n=11 73%	n=13 87%
	False	n=0	n=0	n=0	n=0	n=0	n=0	n=4 27%	n=2 13%

Percentage with the symbol # had a medium size difference of practical importance (d ≥ 0.5 and < 0.8)

Percentage with the symbol * had a large difference of practical importance (d ≥ 0.8)

From Table 4.12 it is clear that the majority of participants understood that it is not good to drink many soft drinks daily. All participants agreed that eating food rich in sugar will cause bad teeth. The majority of participants disagreed that a healthy diet should include many foods containing much sugar, except 7% of the farm participants that agreed. With regard to Question 55 participants also agreed that it is healthier to eat an apple instead of sweets, except for 27% from farm groups. After the intervention 13% were still disagreeing. There was an increase in knowledge, which showed a *d*-value of 0.4 that may be of practical significance.

Participants mentioned that eating too much sugar leads to bad teeth. They also said that they tried not to eat much sugar-containing food although sometimes they experienced a "craving" that they could not resist. They all said it was difficult to control their children because they loved sugar.

4.3.8 FBDG: "Eat salt sparingly"

Table 4.13: Baseline and end knowledge per stratum for the FBDG "Eat salt sparingly"

	Possible Answers	Rural n=12		Formal n==16		Informal n=7		Farm n=15	
		before	**after**	**before**	**after**	**before**	**after**	**before**	**after**
Question 6 I usually put salt on my food when it is on my plate	True	n=1 8%	n=0	n=1 6%	n=0	n=0	n=0	n=6 40%	n=6 40%
	False	n=11 92%	n=12 100%	n=15 94%	n=16 100%	n=7 100%	n=7 100%	n=9 60%	n=9 60%
Question 12 It is not necessary to limit salt when cooking	True	n=1 8%	n=0	n=0	n=0	n=0	n=0	n=7 47%	n=6 40%
	False	n=11 92%	n=12 100%	n=16 100%	n=16 100%	n=7 100%	n=7 100%	n=8 53%	n=9 60%
Question 30 It is a good practice to eat a packet of Simba chips every day	True	n=4 33%	n=1 8%	n=5 31%	n=3 19%	n=2 29%	n=3 43%	n=3 20%	n=3 20%
	False	n=8 67%	n=11 92%	n=11 69%	n=13 81%	n=5 71%	n=4 57%	n=12 80%	n=12 80%
Question 51 I put salt in all the foods that I cook	True	n=1 8%	n=0	n=0	n=0	n=0	n=0	n=8 53%	n=7 47%
	False	n=11 92%	n=12 100%	n=16 100%	n=16 100%	n=7 100%	n=7 100%	n=7 47%	n=8 53%

Percentage with the symbol # had a medium size difference of practical importance (d > 0.5 and < 0.8)

Percentage with the symbol • had a large difference of practical importance (d >0.8)

In Table 4.13, Questions 6 and 12 shows that some participants do limit salt when cooking and they do not add salt to the food at table. Before the intervention 67% of rural participants said it was not a good practice to eat a packet of Simba chips everyday. After the focus group discussion 92% of the participants changed their minds. That was an increase in knowledge with practical significance (d=0.55).

During the focus group discussion participants agreed that too much salt is harmful to the body and that little salt should be used when cooking. Urban participants mentioned that when they used other salt-containing products like beef cubes or barbeque spice, they did not add salt to the food. The main reason given by most of the participants for using salt sparingly was the belief that to much salt causes high blood pressure.

4.3.9 FBDG: "Eat fats sparingly"

Table 4.14: Baseline and end knowledge per stratum for the FBDG: "Eat fats sparingly"

	Possible Answers	Rural n=12		Formal n=16		Informal n=7		Farm n=15	
		before	**after**	**before**	**after**	**before**	**after**	**before**	**after**
Question 1 A healthier diet should include a lot of fatty foods	True	n=0	n=0	n=0	n=0	n=0	n=0	n=1 7%	n=1 7%
	False	n=12 100%	n=12 100%	n=16 100%	n=16 100%	n=7 100%	n=7 100%	n=14 93%	n=14 93%
Question 10 It is healthy to be fat	True	n=0	n=0	n=0	n=1 6%	n=0	n=0	n=0	n=0
	False	n=12 100%	n=12 100%	n=16 100%	n=15 94%	n=7 100%	n=7 100%	n=15 100%	n=15 100%
Question 32 It is not necessary to use fat or oil when cooking *vegetables*	True	n=11 92%	n=11 92%	n=14 88%	n=14 88%	n=7 100%	n=7 100%	n=7 47%	n=11 73%
	False	n=1 8%	n=1 8%	n=2 12%	n=2 12%	n=0	n=0	n=8 53%	n=4 27%
Question 45 It is not healthy for you to eat lots of fat	True	n=12 100%	n=12 100%	n=16 100%	n=16 100%	n=7 100%	n=7 100%	n=14 93%	n=14 93%
	False	n=0	n=0	n=0	n=0	n=0	n=0	n=1 7%	n=1 7%

Percentage with the symbol # had a medium size difference of practical importance (d ≥ 0.5 and < 0.8)

Percentage with the symbol * had a large difference of practical importance (d≥ 0.8)

Table 4.14 reveals that the majority of participants agreed that a healthy diet should not include too many fatty foods, except for one (1) participant from the farm participants. In Question 10, there was a decrease in knowledge gain from the urban-formal group with a

d-value of 0.25 which is of practical insignificance. With regard to Question 32, stating that it is not necessary to use fat or oil when cooking vegetables, the knowledge remained at the same level for the participants from three (3) strata, except for the farm group where there was an increase in knowledge from 47% to 73% with *d*-value of 0.6 which is of practical significance. Participants agreed again that it was not healthy to eat much fat, except for the one participant from the farm group.

Farm and rural participants said that they were not using fats sparingly because they used fats in almost every food that they cooked. They mentioned that the reason for using fats in almost every food was that they did not favour boiled foods. Urban participants said they rather avoided fats and/or oils when cooking because they did not want to become fat.

4.3.10 FBDG: "Drink lots of clean, safe water"

Table 4.15: Baseline and end knowledge per stratum for the FBDG "Drink lots of clean, safe water"

	Possible Answers	Rural n=12		Formal n=16		Informal n=7		Farm n=15	
		Before	**after**	**before**	**after**	**before**	**after**	**before**	**after**
Question 4 It is important to drink a lot of water daily	True	n=12 100%	n=12 100%	n=16 100%	n=16 100%	n=7 100%	n=7 100%	n=12 80%	n=13 87%
	False	n=0	n=0	n=0	n=0	n=0	n=0	n=3 20%	n=2 13%
Question 15 Drinking a lot of water is harmful to your body	True	n=0	n=0	n=4 25%	n=5 31%	n=6 86%	n=7 100%	n=7 47%	n=7 47%
	False	n=12 100%	n=12 100%	n=12 75%	n=11 69%	n=1 14%	n=0	n=8 53%	n=8 53%
Question 38 It is not necessary to put a clot or lid on a bucket of clean water	True	n=0	n=0	n=0	n=0	n=0	n=0	n=0	n=0
	False	n=12 100%	n=12 100%	n=16 100%	n=16 100%	n=7 100%	n=7 100%	n=15 100%	n=15 100%
Question 53 Water drawn from rivers, wells and dams has to be boiled before use	True	n=12 100%	n=12 100%	n=16 100%	n=16 100%	n=7 100%	n=7 100%	n=14 93%	n=15 100%
	False	n=0	n=0	n=0	n=0	n=0	n=0	n=1 7%	n=0

Percentage with the symbol # had a medium size difference of practical importance (d ≥ 0.5 and < 0.8)

Percentage with the symbol * had a large difference of practical importance (d ≥ 0.8)

From Table 4.15, it becomes clear that the majority of participants agreed that it is important to drink adequate amounts of water daily. All participants agreed that it was

necessary to put a lid on a bucket of water and that the water drawn from the dam, well and river should be boiled before use.

From the focus group discussion participants said that drinking enough clean safe water was important because it kept the body healthy. Farm participants mentioned that they sometimes got water from the well and that their water did not seem to be clean for drinking but because they have no choice, they boil the water before drinking it.

4.3.11 FBDG: "If you drink alcohol drink it sensibly"

Table 4.16: Baseline and end knowledge per stratum for the FBDG "If you drink alcohol drink it sensibly"

	Possible Answers	Rural n=12		Formal n=16		Informal n=7		Farm n15	
		before	**after**	**before**	**after**	**before**	**after**	**before**	**after**
Question 7 Your body needs alcohol to stay healthy	True	n=1 8%	n=1 8%	n=1 6%	n=1 6%	n=1 14%	n=3 43%	n=6 40%	n=6 40%
	False	n=11 92%	n=11 92%	n=15 94%	n=15 94%	n=6 86%	n=4 57%	n=9 60%	n=9 60%
Question 26 Drinking a lot of beer is harmful to your body.	True	n=12 100%	n=12 100%	n=16 100%	n=16 100%	n=7 100%	n=7 100%	n=15 100%	n=14 93%
	False	n=0	n=0	n=0	n=0	n=0	n=0	n=0	n=1 7%
Question 42 It is healthy to take alcohol drinks daily	True	n=0	n=0	n=0	n=0	n=1 14%	n=3 43%	n=6 40%	n=6 40%
	False	n=12 100%	n=12 100%	n=16 100%	n=16 100%	n=6 86%	n=4 57%	n=9 60%	n=9 60%

Percentage with the symbol # had a medium size difference of practical importance (d ≥ 0.5 and < 0.8)

Percentage with the symbol * had a large difference of practical importance (d ≥ 0.8)

From Table 4.16, it becomes evident that the participants agreed that drinking a lot of beer was harmful to the body, except for 7% of the participants from the farms. With regard to Question 42, informal and farm participants understood that it was healthy to take alcoholic drinks daily.

During the focus group discussion they mentioned that alcohol could lead to some diseases although farm and rural participants said that they do drink alcohol. It was also said that alcohol wasted money.

CHAPTER 5: DISCUSSION

5.1 Introduction

In this chapter, the results given in the previous chapter will be discussed and compared to literature. As the objectives were to assess the effectiveness of the South African Preliminary Food-based Dietary Guidelines (FBDG) as a nutrition education tool and also to identify constraints in understanding and implementing the FBDG, the general understanding and interpretation of the participants on each FBDG will also be addressed in this section.

5.2 Demographic information

The study sample was not representative of the total Tswana population in the Rustenburg area. In terms of age distribution, we had more participants in the age group of 61 years and older in the farm area compared to the rural, urban-formal and urban-informal. The women living in the farm areas were the oldest and had the lowest education. None of them was employed and they also cooked for more family members (up to 7 members) than the other groups.

The women in the urban-formal area, however, were all employed part-time at the time the study was conducted, the majority cooked for two to three (2-3) children and had received an education up to Grade 10-12. All of them reported the highest income level.

Participants from the rural area had an education level of up to Grade 10-12, while the farm participants had education level from Grade R-12. The rural participants had the highest education level compared to participants from the farm, urban-formal and urban-informal areas.

5.3 Food-Based Dietary Guidelines

5.3.1 "Enjoy a variety of foods"

Participants from rural, urban-formal and urban-informal areas interpreted this message as eating different kinds of foods. The other response was "we are not supposed to eat the same food every day". Participants from the farm area however did not know what the message meant as was discovered in the focus group discussions. Responses like, "we have never heard or read the message 'enjoy a variety of foods' before" confirmed this observation.

All participants cited that it was difficult to eat different kinds of foods every day. Most of them were not working and others had part-time jobs. They also mentioned that although they knew that they were not supposed to eat the same food every day, they could not afford to avoid it and they sometimes had only mealie-meal (pap) and milk with no vegetables or fruits for two to three (2-3) consecutive days. When their husbands received a salary and they had money, they bought other groceries which included vegetables, meat and mealie-meal.

The farm participants mentioned that their husbands prefer meat and mealie-meal (pap). They generally did not favour other food products and it was, therefore, difficult to cook different kinds of food every day, even on the first week of the month when groceries were available. Only when they had no money to buy meat, did they cook mealie-meal (pap) with cabbage or potato soup or stew.

Rural, urban-formal and urban-informal participants mentioned that even if they had the same food for two to three (2-3) days when they did not have enough money, they would cook them in different ways like dumplings (flour with instant yeast), with potato stew or just boiling the dumplings in a dish or baking them to make what is commonly known as "dikgaragana" (it reminds of scones but consists of flour with yeast and water only).

However, all participants indicated that they would enjoy a variety of foods on a regular basis. They indeed made efforts not to eat the same food every day, especially when different kinds of food were available at home.

South Africa is a society in transition with a double burden of diseases related to both under and over nutrition. FBDG were proposed to attempt to resolve many of these public health problems. Participants from all the strata did agree that healthy foods helped them not to fall ill so easily.

"Enjoy a variety of foods" focuses on some of the consequences arising from lack of dietary variety. Results of the 1999 National Food Consumption Survey (NFCS) in South Africa showed that the diets of many households, particularly in the lower income bracket, have a limited dietary variety (Maunder *et al.,* 2001). The aim of the guidelines is to encourage people to change their diets where necessary so as to increase the variety of foods eaten and to enjoy their food. From the results of this study the knowledge of the participants did increase regarding this FBDG. It should however be kept in mind that according to Stuart & Achterberg (1997) and the American Dietics Association (ADA) (1996), an intervention is a communication process that goes beyond information dissemination but aims at producing nutritionally literate, motivated people who are willing and able to apply their nutrition knowledge in order to create sustained behavioural change conducive to health and well-being. Therefore people should be skilled to implement these guidelines within the reality of a lack of money.

5.3.2 "Be active"

Participants interpreted the message as "exercising the body by going to the gym or running". They did not associate the message with any of the household chores like fetching the water from the community tap outside the village. When they were asked if they were active with their family, they said they could not afford to go to the gym and they were too lazy to run because sometimes they were tired of the household chores. They were told that they were actually meeting the demands of this message by performing their household chores. They started mentioning all those household chores that they regularly performed, for example fetching wood, shopping, cleaning and playing.

Participants said that it was important to be active because you will not fall ill so easily. They mentioned that some people are using this message to lose weight.

The "Be active" guideline is based on the well-established link between physical activity and lowered risk of all-cause mortality, as well as mortality and morbidity associated with many chronic diseases according to Lambert *et al.* (2001). The American College of Sports Medicine (ACSM) and United State Centre for Disease Control (USCDC) now recommend that individuals should attempt to accumulate thirty (30) minutes or more of moderate intensity physical activity on most, preferably all days of the week.

There was a knowledge gain from the participants on this guideline, however it was not based on realising the importance of physical activity on health, but on identifying sources of physical activity. They were encouraged by the idea of regarding household chores as exercise and that exercise was possible without extra expenditure.

5.3.3 "Make starchy foods the basis of most meals"

Participants from the farm did not know what the message meant and they asked for an explanation of the word "steisele", the meaning of which they did not know. Participants understood the word "starch" more easily than the one in "tswana" which is "steisele".

The urban and rural participants interpreted the message as eating food that contains starch every day. Participants were concerned about the general perception among people that the intake of starch will result in gain of body weight. It was therefore their opinion that starchy foods should rather not be made the basis of all meals.

Rural and farm participants mentioned cabbage as starchy food. All participants consumed mealie-meal (maize) porridge more than any other starchy food but prepared the porridge in different ways, e.g. soft porridge (motogo), stiff porridge (pap) and sour porridge (ting). Their practice was that when they cook rice or pasta, they usually take out the water when boiling. The idea was to reduce the starchy content within the food. Participants mentioned that in reality they were applying this guideline because they will have soft porridge in the morning, bread for lunch and mealie-meal porridge (maize) for supper.

The guideline "Make starchy food the basis of most meal" is aimed at optimum intakes of different starches such as maize, wheat, sorghum, oats and rice in the form of porridge,

bread, pasta, samp, mealie-meal, rice, breakfast cereals and other products. The guideline advises that in planning of meals the starchy food should be the central or main food (Vorster & Nell, 2001). Participants were actually implementing this guideline although they thought it was a wrong practice.

The increase in knowledge of the participants on this guideline was to reassure them that their daily practices, which they thought were wrong, were in fact in order. South African government has passed laws on food fortification. This means that food manufactures are now adding vitamins and minerals in some staple foods like maize meal and bread flour.

5.3.4 "Eat plenty of vegetables and fruits every day"

All participants understood the message as eating a lot of vegetables and fruits every day because they are good for one's health.

Participants mentioned that when they cooked vegetables they initially added ample amounts of water and sometimes they drained the vegetables afterwards by pouring down the water as soon as the cooking had been completed. Participants wanted to know the difference between raw and cooked vegetables in terms of nutritional value. It was explained to them that raw vegetables contains more nutrients than cooked vegetables. During the cooking process some water-soluble vitamins (vitamin C and B-complex) are lost as they are sensitive to heat.

The reasons given by the participants for the importance of this guideline were that vegetables and fruits were known to build the body and bones, keeping them healthy. The healthier the body the better as far as the chances of contracting diseases were concerned. They also pointed out that the intake of vegetables and fruit lessened the necessity for taking laxatives. According to Love & Sayed (2001) vegetables and fruits are important sources of many vitamins, minerals, fibre and other substances. Encouraging the intake of vegetables and fruit is therefore still the best overall advice.

Today, eating more vegetables and fruit for better health is a concept with which most of the general public is familiar. However, a change in the mindset of the participants

regarding their practice was observed after the intervention when participants agreed that vegetables cooked in just a little water would retain more of their health giving properties. This shows that the FBDG sensitised them on the importance of eating vegetables and fruit more often.

5.3.5 "Eat dry beans, peas, lentils and soya beans regularly"

All participants understood the guideline although all of them said they had never seen or heard the message before. They interpreted it as eating dry beans, peas, lentils and soya every day. Most of the participants reported that they do eat these products like dry beans cooked with samp and peas in a soup, and soya in the form of soya mince cooked in a stew or sauce.

The majority of participants understood that soya and dry beans were rich in protein. Farm participants thought that dry beans were not nutritious because they were inexpensive and easily available. Rural and urban-formal participants said it was important to eat dry beans and soybeans and added that they were used to eating the beans in winter in the form of soup, which would keep them warm.

The guideline "Eat dry beans, peas, lentils and soya beans regularly" aims to improve the overall health of all South Africans. Dry beans and soya beans are good sources of quality protein and can be used to substitute animal protein sources. Soya beans provide unique isoflavones, which may be of benefit in the prevention of many of the common diseases seen in the Western population (Venter & Van Eyssen, 2001).

Although it became clear during the focus group discussion that the participants understood that dry beans, peas, lentils and soya beans could be used to supplement meat and are rich in protein, it was not confirmed in the answers from the post interviews questionnaire.

5.3.6 "Chicken, fish, meat, milk and eggs could be eaten daily"

All participants interpreted the message as eating chicken, fish, meat, milk or eggs daily. They mentioned that the message was very simple because all the food products were in

the message and all the foods were known to them. When discussing the foods associated with the message they, however, for example mentioned milk (fresh milk) as such only, without referring to any related products containing milk, e.g. cheese. The same happened in the case of meat.

All the participants said it was important to eat these food products because they assisted in building the body and keeping it healthy. Although all participants understood this guideline, they did not practise it because they could not afford to. Eggs were the most affordable of these products.

The guideline "Meat, fish, chicken, milk and eggs can be eaten every day" is formulated to indicate that meat, poultry, fish, eggs, milk and other dairy products have a place in a healthy balanced diet, but that a carefully chosen vegetarian diet can also be adequate without these foods. The strongest argument for including foods from animals in the daily diet is that they are the best sources of high-quality protein and excellent sources of essential micronutrients such as iron, zinc, calcium, thiamine, riboflavin and the omega 3-fatty acids (Scholtz *et al.*, 2001).

According to Scholtz *et al.* (2001), these micronutrients are more bio-available than in plant foods. Animal derived foods even increase availability of micronutrients in plant foods when they are eaten together.

5.3.7 "Use sugar and sugar-containing foods and drinks in moderation"

The participants were familiar with this guideline and it was understood as eating foods or drinks that do not contain much sugar.

Participants said they tried not to eat large quantities of sugar or sugar-containing foods although sometimes they experienced a "craving" that they could not resist. All participants said it was difficult to control their children because they loved sugar. Their children usually got or bought the sweet products at schools or at the shops.

All participants said that although it was difficult to use sugar and sugar-containing food in moderation, they knew it was very important. The reason given by participants why

sugar and sugar-containing foods should be eaten in moderation was because it would lead to bad teeth. This gave an indication that although they understood this guideline, they did not really know or understand the reason why.

The dietary guidelines urge people, under normal dietary circumstances, to choose beverages and foods that limit sugar intake. Specifically sugars should account for only ten percent (10%) or less of the day's total energy intake (Whitney & Rolfes, 2002). In moderate amounts, sugar adds pleasure to meals.

5.3.8 "Eat salt sparingly"

All participants understood this guideline. They were always told at the clinics that salt in excess is harmful to the body.

According to Charlton & Jooste (2001), there is some controversy about the causal link between salt intake and hypertension, and even with cardiovascular diseases. They further state that evidence for and against sodium restriction to control hypertension may confuse health providers and salt consumers to the extent that opposing arguments may result in a loss of credibility in any salt-related dietary guidelines. These opposing views appear to have originated because of the difficulty of accurately measuring sodium intake in large groups of a study.

Despite the controversial issues surrounding the salt-hypertension relationship, strong evidence does point to the validity of restricting salt intake to lower blood pressure (Cutler *et al.*, 1991).

It is thus important to emphasise during education sessions that salt restriction could be achieved by reducing the amount of salt added during the cooking process and at the table and that processed food such as bread, tinned food, cheese and snacks contain substantial amounts of salt.

A number of participants in this study did practise salt restriction. This became clear from the focus group discussions where the urban-formal participants mentioned that when

they used salt-containing products like beef cubes or barbeque spice, they did not add salt to their food.

5.3.9 "Eat fats sparingly"

All participants were familiar with this guideline. They understood it as using limited amounts of fatty substances when cooking.

However, participants from the farm and rural areas said that they were not practising this guideline and they were using fats in almost every type of food that they cooked. They explained that their reason for doing so was that they disliked foods cooked in water only. Urban-formal participants said they minimised on fatty or oily ingredients because they wanted to avoid becoming fat themselves. All participants said that it was difficult to use fats sparingly.

According to Wolmarans & Oosthuizen (2001), South Africans who consume a high-fat diet should be encouraged to lower fat intake, but they should also be encouraged to make the right choices in terms of type of fat they consume.

Wolmarans & Oosthuizen (2001) also pointed out that "eating fats sparingly" does not mean a no-fat diet. A very low-fat diet has other adverse effects and may contribute to undernutrition and stunted growth in infants and children.

5.3.10 "Drink lots of clean safe water"

To all the participants this guideline meant that one should drink water that is safe and clean. Participants from the farm mentioned that they sometimes got water from a well and that this water seemed not to be clean for drinking, but because they have no choice, they boiled the water before drinking it. The other participants did not have a problem in getting safe water.

Participants reported that together with their families, they did drink lots of water. The rural and urban-formal participants knew that they needed to drink six to eight (6-8) glasses of water per day. They mentioned that sometimes it was very difficult to

implement this guideline especially when it was winter, when they would rather drink coffee or tea, which indicated that the participants did not realise that water-containing beverages were included by the guideline.

According to Valtin (2002), the recommendation that we drink at least eight (8) glasses of water a day is subject to a broad range of interpretation. The concept he has is daily intake of drinking fluid, meaning all drinking fluids, including tap water and bottled water, coffee, tea, soft drinks, milk, juices and possibly even beer in moderation.

5.3.11 "If you drink alcohol, drink it sensibly"

To the participants this guideline meant that they should not drink alcohol because that could lead to some diseases. However most of the farm and rural participants said they were drinking alcohol together with their husbands and mainly in the form of home brewed beer.

This corresponded with other studies on the farm communities, reporting the problem of alcohol abuse and the adverse effects on family life (Kruger *et al.*, 2006).

The urban participants said there should be a standard like with water, which says drink at least six to eight (6-8) glasses of water per day. They found this guideline confusing because a person might drink only one glass and say it is sensible while another one might drink more and also say it is sensibly. Participants said it was important to drink alcohol sensibly because it wasted money that could have been used for something else.

According to Van Heerden & Parry (2001), alcohol use has a very long history and is part of human existence. Its abuse has many detrimental health, social, lifestyle and economic effects. Recent research has, however, identified some potentially positive health effects associated with moderate intake of alcohol. The food-based dietary guideline Working Group (WG) recognised these facts and decided that it was both prudent and necessary to formulate a guideline on the sensible use of alcohol.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This chapter outlines the conclusions reached with regard to the study results. It also contains certain recommendations that were formulated in anticipation of better assistance when using the Food-Based Dietary Guidelines (FBDG) as a nutrition education tool.

6.2 Conclusions

The main sources of food and nutrition knowledge for all the groups were the health clinics that were visited by the participants. These health care clinics were repeatedly mentioned during the focus group discussions. This can also mean that information received from the health clinics contributed to the gain in knowledge.

One of the main limitations to the implementation of the guidelines appeared to be existing financial constraints. This is, for example, why a guideline like "Enjoy a variety of foods" is difficult to follow. Failure to include a variety of foods on a regular basis in the daily diet could be ascribed to financial incapacity rather than to a lack of knowledge. The results of the questionnaire (Question 18) confirmed this as it was quite apparent that by far the majority of participants agreed with the advantages associated with a variety of foods on a daily basis.

Participants were aware of the wide variety of foods, but were themselves mainly limited to the use of staple foods like maize, samp and rice. They usually could not afford to buy more than what are commonly known as the basic foods. It is therefore necessary to explain to poor communities how a low variety also can lead to optimal intakes.

Pictures of different kinds of foods proved to be an excellent method of determining general food-related knowledge. The group discussions allowed for insight into the existing knowledge, i.e. prior to intervention. Most of the rural, urban-formal and informal

participants had previously been exposed to the guidelines or information of a similar content. As far as most of the questions were concerned, the farm participants differed with participants from the remaining strata. Post-intervention results, however, clearly indicated an improved level of knowledge and efforts to change to improved practices according to the newly gained knowledge. For example in Question 11 "bicarbonate of soda must be added when cooking green vegetables" only some participants disagreed before the intervention, but after intervention 100% of them disagreed). Similar tendencies could be observed in the analyses of quite a few other question results as well.

The terminology of the FBDG as expressed in the Tswana translation, proved to be a success on the whole with only but a rare exception here and there, e.g. the term "steisele" (starch), as it seemed that some of the participants were more familiar with the English word "starch".

The launching of this study project appeared to be to the advantage of those who participated. Their knowledge of nutrition and wholesome food-related practices revealed favourable improvement, e.g. some of them did not initially appreciate the importance of drinking water and limiting soft drinks or cooking vegetables in little water for a short period of time. Based on the results of the post-questionnaire, an improvement of knowledge and understanding was evident.

Despite the fact that they knew they were not supposed to eat fatty and salty foods, it was not reflected in their eating habits.

Participants from all groups endorsed the importance of implementing the guidelines predominantly for health reasons. It was evident that they believed their eating habits could have an influence on their general health and the body's ability to combat disease, e.g. the advantages attached to drinking enough water and eating different kinds of food.

On the whole, participants understood the messages carried across by the FBDG. They, however, realised that implementation of the guidelines might be hampered by financial constraints but at the same time also displayed a positive attitude by considering such initiatives as growing their own vegetables.

FBDG could be used as an excellent tool for teaching people how to improve the nutritional status of what they were eating, as had been proved during this study. The responsibility of changing wrong or less wholesome practices to good practices would, of course, remain with those who prepare and eat the food.

A willingness to promote proper and healthy eating habits could undoubtedly be detected during the group discussions, which means that they will in all probability implement proper eating practices provided that the necessary foodstuffs are available. At the same time it needs to be mentioned that there are those who have fixed ideas and habits, or are ignorant, and who will remain unchanged in spite of information offered to them.

6.3 Recommendations per guideline

6.3.1 FBDG "Enjoy a variety of foods"

However the understanding of this FBDG had been in all the strata, it is and remains very important to recommend that more emphasis be placed on teaching people how to make the correct choices when it comes to obtaining and preparing food. Ways and means of enhancing food availability have to be considered, e.g. in the face of a shortage of money. In many cases the relevant knowledge is there or has been attended to, e.g. to avoid eating the same foods every day, but still the practical implementation is lacking. The aim of the guideline is to encourage people to change their diet where necessary so as to increase the variety of foods eaten and to enjoy their food. Therefore people should be skilled to implement this guideline within the reality of a lack of money

6.3.2 "Be active"

Some of the participants misinterpreted the message of this guideline with regard to two (2) aspects. It is, for example, important to take note that this guideline should in the first pace be implemented for the sake of a healthy lifestyle and not for losing weight. It should also be noted that living up to this guideline does by no means imply additional or formal exercise, for example at a physical exercise centre ("gym") or by joining a club (cycling, jogging, etc.). To be active need not incur any extra expenses, something which could otherwise have been an uncomfortable barrier. It proved to be a relief to many of

the participants to learn that ordinary household chores could also be counted as physical activities. Participants should be encouraged to practice this guideline and to keep going with such activities as they were already performing.

6.3.3 "Make Starchy foods the basis of most meals"

The message was understood although participants thought that it was not a good practice because eating starchy foods would lead to weight gain. It is recommended that a better perception about the value of starches be promoted through relevant education. Through the food fortification programme led by the Department of Health (DOH) more emphasis needs to be placed on certain issues such as brown bread being healthier than white bread. Staple foods like maize meal and bread flour are now fortified with vitamins and minerals. There are no constraints in terms of implementing this guideline because they had already been practising it. It seemed a good thing to reassure participants that their daily practice was in fact the correct way of doing.

6.3.4 "Eat plenty of vegetables and fruits every day"

There is a need to emphasise the cooking preparations of vegetables because some micronutrients can be destroyed during the cooking process. Availability of food products seems to be an obstacle, vegetable gardens should be promoted and encouraged for productivity and income generation.

6.3.5 "Eat dry beans, peas, lentils and soya beans regularly"

Emphasis should be placed on the fact that no individual kind of food can be singled out as being only bad or only good, and it is rather the daily diet (combinations and balances) that might be bad or good. Some of the participants thought that beans were not nutritious because they were not expensive. In this case, a lack of relevant knowledge resulted in unnecessarily suffering disadvantages. Such misperceptions must be addressed by teaching people to make correct choices of foods, especially when limited money resources form part of the decision-making process. There were no constraints as they were already practising this guideline.

6.3.6 "Chicken, fish, meat, milk or eggs could be eaten daily"

More effort should be made to educate people with regard to the confusion around the difference between red meat and chicken, the health-providing properties of the one in comparison with the other. Mention should also be made of the fact that not only children should drink milk.

According to Scholtz *et al,* (2001) the argument to limit intake of food obtained from animals is based on evidence that over consumption of some may increase the risk of chronic diseases, particularly cardiovascular diseases and certain forms of cancer. The main constraint to including these foods in the diet is that, compared with plant-derived foods, they are expensive. Taking all this into account, it is important to view the FBDG "dry beans, peas, lentils and soya beans" and "chicken, fish, meat or eggs" in the context of each other and to emphasise balanced substitution possibilities. Attention should certainly be paid to these aspects in future programmes of food-related education.

6.3.7 "Use sugar, and sugar-containing foods and drinks in moderation"

The harmful effects caused by the consumption of foods containing large amounts of sugar must be emphasised because participants do not take the messages seriously. They know, but they are continuing to allow their children to eat sweets and more food containing large amounts of sugar (Watt & Sheiham, 1999).

The reason given by participants why sugar and sugar-containing foods should be eaten in moderation was because they believed that doing so would lead to bad teeth. This gave an indication that although they understood this guideline, they did not really know or understand the more important reasons behind it, one of which is obesity which has been proved medically to link with hypertension, cardio-vascular and other related diseases. It is apparent that there is an urgent need for more in-depth education in relation to the intake of sugar (bad teeth can, after all, be prevented by cleaning the teeth regularly and then more specifically after having taken sugary substances).

6.3.8 "Eat salt sparingly"

The habit of adding salt to food at the table or to food that already contains a certain amount of salt must be discouraged. The participants, however, displayed sound understanding of the principle of avoiding the intake of too much salt and of the possible health-related effects that might follow in the wake of doing so.

6.3.9 "Eat fats sparingly"

People need to be encouraged to minimise on fatty foods and to focus on low-fat diets. It is also important to alert the awareness to the advantages accompanying such efforts as well as to the possible adverse effects that might develop as a result of over-indulgence in fatty substances. They should also understand that a low-fat diet does not mean that all fat should be excluded. It is recommended that these aspects be discussed during relevant education programmes.

6.3.10 "Drink lots of clean safe water"

Participants showed an understanding of this guideline. Emphasis should be placed on boiling water before consumption as certain areas are still exposed to water that holds health risks because of impurity.

6.3.11 "If you drink alcohol, drink it sensibly"

The fact that the consumption of unlimited quantities of alcohol can bring about devastating effects to an individual's health, is what can be referred to as common knowledge. People do, however, often act against their own better judgement. Some participants mentioned that they knew they were not supposed to drink alcohol but they drank it anyway. More education on the harm alcohol could cause, especially to vulnerable groups like pregnant women, lactating mothers and people with chronic illnesses are seriously recommended.

6.4 Recommendations

More effort should be made to spend more time on focus group discussions, especially with people of lower levels of education. The research results and analyses gave a clear indication of existing misunderstandings. Group discussions allow for personal contact which makes it easier to identify and address individual misinterpretations. Group discussions also allow scope for the utilisation of aids by means of which better insight and better memory retention can be enhanced. One such misinterpretation identified during the research discussions was, for example, that starchy foods had better be avoided because one might gain weight.

In nutrition education, when using food pictures to explain the FBDG guidelines to consumers or study participants, pictures of familiar foods should be used in order to avoid any misunderstanding.

It is recommended that more emphasis be placed on teaching people how to make the correct choices in the first place, and how to select good choices for the money they have available. During the focus group discussions some of the farm participants mentioned that their husbands preferred meat and mealie-meal (pap). They did not favour other food products, because it was difficult to cook different kinds of food every day. They had preferences even during the first week of the month when a variety of groceries to choose from was at their disposal.

Questions in the knowledge test should not be repeated or phrased differently. It would seem that the rephrasing of questions would almost inevitably lead to confusion among participants. This observation was made with regard to Question 2.16 "it is healthy to be physically active" and Question 2.20 "being active has nothing to do with being healthy". Messages should be short and straight to the point.

Participants recommended that the guideline "Chicken, fish, meat, milk or eggs could be eaten daily" be adapted to read "Chicken, fish, meat products, milk products or eggs could be eaten daily" or "Chicken, fish, meat, milk or eggs – as well as products containing these – can be eaten daily." This would help participants to understand that products such as sausage, yoghurt, cheese and so on are included.

Schools should also include basic nutrition related issues in the curriculum so that even when parents fail to teach their children, at least they would have gained some information from schools. Children are naturally keen observers and are likely to share what information they have at home as well. Children are almost without exception fond of sugary and sweet edibles, thus they should be taught at school to use sugar in moderation.

Participants recommended that there should be a standard for the guideline "If you drink alcohol, drink it sensibly". They said the word "sensibly" could be abused by people. They suggested that mention be made of specific measures of quantity, e.g. not more than 2-3 glasses per day. To some people, three (3) litres of beer per day might be sensible.

It is recommended that there should be community-outreach programmes focusing on nutrition and food security. This should be approached according to an integrated model that would create scope for different departments to be involved, e.g. Departments of Agriculture, Education, Health and Social Welfare. All these departments do have projects addressing food security aspects but because of lack of integration, there are many duplication services and the same individuals are benefiting from all departments while others are not included at all. Community based development programmes to support nutrition education using FBGD should involve projects such as food gardens to improve nutritional status and income generation so as to sustain a healthy lifestyle.

REFERENCES

1. ADA. 1996. Position of the American Dietetics Association. Nutrition Education for the public. *Journal of the American Dietetics Association,* 96(11):1183-1187.

2. ANON. 2000. Food Based Dietary Guidelines. *South African Sugar Association.* Nutrition Department. Durban.

3. BOURNE, L.T. & SEAGER, J.R. 2001. Water the neglected nutrient. *South African Journal and Clinical Nutrition,* 14(3):S64 (Supplement S1-S80).

4. CHARLTON, K.E. & JOOSTE, P.L. 2001. Eat salt sparingly, don't shake. *South African Journal and Clinical Nutrition,* 14(3):S55 (Supplement S1-S80).

5. CLAY, W. 1997. Preparation and use of Food Based Dietary Guidelines. *Food and Nutrition Association/American Nutrition Association,* 19:42-46.

6. COHEN, J. 1998. Statistical power analysis for behavioural sciences. *2nd ed. Hillside, NJ: Erlbaum.*

7. COMAROFF, J. & COMAROFF, J. 1991. A revelation and revolution. Christianity, colonialism, and consciousness in South Africa. London: University of Chicago Press 4114p.

8. CONTENTO, I., BALCH, G., BRONNER, Y., LYTLE, L., MALONEY, S., OLSON, C. & SWADENER, S. 1995. The effectiveness of Nutrition education and implementation for nutrition education policy, programs and research - A review of research. *Journal for Nutrition Education,* 27(6):279-418.

9. CORNWELL, R. 1988. Origins of the Sotho-Tswana people and the history of the Batswana. *Africa insight,* 18(2):96-103.

10. CUTLER, J.A., FOLLMANN, D., ELLIOTT, P. & SUH, I. 1991. An overview of randomised trials of sodium reduction and blood pressure. *Hypertention,* 17 (Supplement I-27-33).

11. DORRINGTON, R., BOURNE, D., BRADSHAW, D., LAUBSCHER, R. & TIMAEUS, I. 2001. The impact of HIV/AIDS on adult mortality in South Africa. Technical Report: National Programme for Health Systems and Policy. *Cape Town: Medical Research Council.*

12. FAO/WHO. 1992. Promoting appropriate diets and healthy lifestyles: Theme paper No.5. In: Major issues for nutrition strategies. *International Conference on Nutrition, Dec. 1992. Rome.*

13. FAO/WHO. 1998. Preparation and use of food based dietary guidelines: *Report of joint FAO/WHO consultation, Nicosia/Cyprus, Geneva.*

14. GIBNEY, M. 1997. Dietary guidelines: Back to basics. *C-H-O Carbohydrates,* 7(4):1-3.

15. GIBNEY, M. & VORSTER, H.H. 2001. South African Food Based Dietary Guidelines. *South African Journal of Clinical Nutrition,* 14(3):S2 (Supplement S1-S80).

16. HARRIS, S.S. 2000. Dietary guidelines for Americans. *Food Austrailia, 2000,* 52(6):212-215.

17. HENRY, J.K. 1998. South African health review for 1998. Family Foundation. *Durban: Health Systems Trust.*

18. HENRY, J.K. 2001. South African health review for 2001. Family Foundation. *Durban: Health Systems Trust.*

19. KRUEGER, R., SATIA, J. & CASEY, M.A. 2000. Focus Group: A practical guide for applied research. *3rd ed. London. New Delhi.*

20. KRUGER, A., LEMKE, S., PHOMETSI, M., VAN'T RIET, H., PIENAAR, A. & KOTZE, G. 2006. Poverty and household food security of black South African farm workers: The legacy of social inequalities. *Public Health Nutrition,* 9(7):830-836.

21. LABADARIOS, D., STEYN, N., MAUDER, E., MNTACINTYRE, U., SWART, R., GERICKE, G., HUSKISSON, J., DANNHUSER, A., VORSTER, H. & NESAMVUNI, A. 2001. The National Food Consumption Survey (NFCS) Children aged 1-9 years, *South African Journal for Clinical Nutrition,* 14 (i):9-19.

22. LAMBERT, E.V., BOHLMANN, I.E. & KOLBE, A.T. 2001. Be active - physical activity for health for South Africa. *South African Journal and Clinical Nutrition,* 14(3):S24 (Supplement S1-S80).

23. LOVE, P. & SAYED, N. 2001. Eat plenty of vegetables and fruits everyday. *South African Journal and Clinical Nutrition,* 14(3):S24 (Supplement S1-S80).

24. LOVE, P., MAUDER, E., GREEN, M., ROSS, F., SMALE-LOVELY, J. & CHARLTON, K. 2001. South African Food-based dietary guidelines: Testing of the preliminary guidelines among women in KwaZulu Natal and the Western Cape. *South African Journal and Clinical Nutrition,* 14(i):9-19.

25. LYE, W.F. 1980a. Early history and upheaval. (In Lye, W.F & Murray, C, eds). Transformation on the Highveld: the Tswana and Southern Sotho. *Cape Town: David Phillip* p22-73.

26. LYE, W.F. 1980b. Reconstruction of the Sotho states. (In Lye, W.F & Murray, C eds). Transformations on the Highveld: the Tswana and Southern Sotho. *Cape Town: David Phillip* p45-73.

27. MACINTYRE, U. 1998. Dietary intakes of Africans in transition in the North West Province. *Potchefstroom PU for CHE,* 1-542.

28. MAUNDER, E.J.W., MATJI, J. & HLATSHWAYO-MOLEA, T. 2001. Enjoy a variety of foods - difficult but necessary in developing countries. *South African Journal of Clinical Nutrition,* 14 (3):S7 (Supplement S1 –S80).

29. MAYLAM, P. 1986. A history of the African people of South Africa: From the early Iron Age to the 1970s. *Johannesburg: David Philip* 259p.

30. PATTERSON, R., SATIA, J., KRISTAL, A., NEUHOUSERM. & DRENOWSKI, A. 2001. Is there consumer backlash against the diet and health message? *Journal of American Dietetics Association,* 101(I):37-41.

31. SCHAPERA, I. & COMAROFF, J.L. 1991. The Tswana. Rev. *ed. London: Kegan Paul International* 99p.

32. SCHOLTZ, S.C., VORSTER, H.H. (jr.), MATSHEGO, L. & VORSTER, H.H. 2001. Foods from animals can be eaten every day - not a conundrum. *South African Journal of Clinical Nutrition,* 14(3):S39 (Supplement S1-S80).

33. SETILOANE, G.M. 1976. The image of God among the Sotho-Tswana. Ratterdam: *A Balkema* 298p.

34. SMITH, B. & SMITASIRI, S. 1997. A framework for nutrition education programmes. In: Nutrition educations for the public – Discussions paper of the FAO expect consultation (No. 62). *Rome: FAO.*

35. STEYN, H.S. 2000. Practical significance of the difference in means. *Journal of Industrial Psychology,* 26(3):1-3.

36. STEYN, N., NEL, J., TICHELAAR, H., PRINSLOO, J., DHAJANSAY, M., OELOFSE, A. & BENADE, A. 1994. Malnutrition in Pedi pre- school children, their siblings and caretakers. *South African Journal for Clinical Nutrition,* 7(4):12-18.

37. STUART, T. & ACHTERBURG, C. 1997. Education and communication strategies for different group and settings. In: Nutrition educations for the public-Discussion papers of the FAO expect Consultation (No.62). *Rome: FAO.*

38. TRUSWELL, A. 1998. Practical and realistic approaches to healthier diet modification. *American Journal for Clinical Nutrition,* 67 (Supplement: S835-S905).

39. VALTIN. H. 2002. "Drinking at least eight glasses of water a day". Really? Is there scientific evidence for "8x8"? *American Journal of Physiology.* August 8.

40. VAN DER WATEREN, H. & IMMELMANN, J.L. 1988. Handleiding vir kultuurstudie van die Tswana. *Potchefstroom: H van der Wateren* 197p.

41. VAN HEERDEN, I.V. & PARRY, C.D.H. 2001. If you drink alcohol, drink sensibly. *South African Journal of Clinical Nutrition,* 14(3):571 (Supplement S1-S80).

42. VAN WARMELO, N.J. 1974. The classification of cultural groups. (In Hammand – Tooke, W, D ed. The Bantu-speaking people of Southern Africa. *2nd ed. London: Routledge & Kegan Paul* p56-84.

43. VENTER, C.S. & VAN EYSSEN, E. 2001. More legumes for better overall health. *South African Journal of Clinical Nutrition,* 14(3):S17 (Supplement S1-S80).

44. VORSTER, H.H., LOVE, P. & BROWNE, C. 2001. Development of food–based dietary guidelines for South African- The process. *South African Journal for Clinical Nutrition,* 14(3):Supplement S3-S6.

45. VORSTER, H.H., OOSTHUIZEN, W., JERLING, J.C., VELDMAN, F.J. & BURGER, H.M. 1997. The nutritional status of South Africans: A review of the literature from 1975-1996. *Durban. Health System Trust.*

46. VORSTER, H.H. & NELL, T.A. 2001. Make starchy foods the basis of most meal. *South African Journal of Clinical Nutrition,* 14(3):S17 (Supplement S1-S80).

47. WATT, R. & SHEIHAM, A. 1999. Inequalities in oral health: A review of the evidence and recommendations for action. *British Dental Journal,* 187(1).

48. WHITNEY, E.N. & ROLFES, S.R. 2002. Understanding nutrition. *9th ed. Australia: Wadsworth/ Thomson learning.*

49. WHO. 1998. Preparation and use of food–based dietary guidelines. Report of a join FAO/WHO consultation Technical Report series 880. *Geneva: WHO.*

50. WOLMARANS, P. & OOSTHUIZEN, W. 2001. Eat fats sparingly – Implications for health and disease. *South African Journal of Clinical Nutrition,* 14(3):S48 (Supplement S1-S80).

ANNEXURE A

Food-Based Dietary Guidelines of South Africa: English & Tswana versions

DIETARY GUIDELINES FOR SOUTH AFRICA

DIKAELO TSA LENAANE LA DIJO TSA AFRIKA BORWA

ENGLISH VERSION	TSWANA VERSION
Enjoy variety of foods.	Natefelwa ke mefuta ya dijo.
Be active.	Nna matlhagatlhaga.
Make starchy foods the basis of most meal.	Dira dijo tse di nang le seteisele/setatshe e nne motheo wa dijo ka bontsi.
Eat plenty of vegetables and fruits everyday.	Ja mefutafuta ya merogo le maungo tsatsi le letsatsi.
Eat dry beans, peas, lentils and Soya regularly	Ja dinawa tse di omisitsweng, ditloo, dinawa tse ditala ka matsatsi otlhe.
Chicken, fish, meat, milk or eggs could be eaten daily.	Nama ya kgogo, tlhapi, nama e khibidu, maswi kgotsa mae di ka jewa tsatsi le letsatsi.
Use sugar and sugar-containing foods and drinks in moderation.	Dirisa sukiri le dijo tse dinang le sukiri le dino mo golekaneng.
Use salt sparingly.	Dirisa letswai go se nene.
Eat fats sparingly.	Ja mafura go se nene.
Drink lots of clean safe water.	Nwaa metsi a mantsi a phepa a a lekaneng go nwewa.
If you drink alcohol, drink sensibly.	Fa o nwa bojalwa o bonwe ka tlhaloganyo.

ANNEXURE B

Demographic questionnaire & questionnaire based on FBDG

English & Tswana versions

SECTION 1

Demographic information

1.1 Participants Number

Date		
Interviewer	Researcher	1
	Assistant	2

1.2 Stratum of urbanisation

Rural		1
Urban formal		2
Urban informal		3
Farm		4

1.3 Question

Baseline		1
End knowledge		2

1.4. Please mark the correct answer with x

1. Name

2. How old are you?

10-20 yrs old		1
21-30 yrs old		2
31-40 yrs old		3
41-50 yrs old		4
51-60 yrs old		5
61yrs and older		6

3. What is your education level?

Lower than grade 3		1
Grade 4- 6		2
Grade 7- 9		3
Grade 10 – 12		4
Higher than grade 12		5

4. How many family members are staying with you in your house (including yourself?)

2 members		1
3-5 members		2
6-8 members		3
More than 8 members		4

5. For how many family members do you cook daily?

Total	Adults	Children

6. What is your employment status?

Unemployment		1
Employed part-time		2
Employed full-time		3

7. What is your own income per month?

None		1
R1-R100		2
R101-R500		3
R501-R1000		4
R1001-R2000		5
R2001-R3000		6
More than R3001		7

8. What is your household's total income per month?

None		1
R1-R100		2
R101-R500		3
R501-R1000		4
R1001-R2000		5
R2001-R3000		6
More than R3001		7

9. Do you have electricity?

Yes		1
No		2

10. What source of water does your household use?

River		1
Well		2
Communal outside tap		3
Tank		4
Household outside tap		5
Indoor tap		6

11. What source of energy do you use for preparing food?

Firewood		1
Paraffin		2
Gas		3
Electricity		4
Coal		5

SECTION 2

QUESTIONS RELATED TO THE FOOD BASED DIETARY GUIDELINES

I will now read out statement to you. Please tell if you think the statement is true or false or don't know.

	True	False	Don't know
2.1 A healthy diet should include a lot of fatty food			
2.2 I like giving my family just pap			
2.3 It is good to drink a lot of soft drinks daily			
2.4 It is important to drink a lot of water daily			
2.5 You need food just as 'pap' or bread with every meal, because it gives you energy for the day.			
2.6 I usually put salt on my food when it is on the plate			
2.7 Your body need alcohol to stay healthy			
2.8 A healthy diet should include chicken, meat, egg and cheese in large quantities daily			
2.9 A healthy diet should include a lot of vegetables and fruit daily			
2.10 It is healthy to be fat			
2.11 When boiling green vegetables, bicarbonate of soda must be added			
2.12 It is not necessary to limit salt when cooking			
2.13 I think that healthy food will help me not to get sick so easily			
2.14 Soya beans are rich in protein			
2.15 Drinking a lot of water is harmful to the body			
2.16 It is healthy to be physically active			
2.17 Red meat is healthy than chicken			
2.18 Our daily diet should include a lot of different foods			
2.19 Tomatoes are rich in protein, thus can be used instead of meat			
2.20 Being active has nothing to do with be healthy			
2.21 I prefer to eat white bread even though brown bread is healthier			
2.22 As a grown up, I do not need to drink milk every day			
2.23 Vegetables should be cook in little water for a short time			
2.24 Eating a lot of food rich in sugar daily will cause bad teeth			
2.25 I don't care what I give my family to eat, just as long as they get their stomach full			
2.26 Drinking a lot of beer is harmful to the body			
2.27 Meat, fish, chicken and milk are good source of protein			
2.28 Dry beans should not be eaten more than once a week			
2.29 Eating eggs is just as good as eating meat			
2.30 It is a good practice to eat a packet of Simba chips everyday			
2.31 Dried beans can be used instead of meat			
2.32 It is not necessary to put fat or oil when cooking vegetables			
2.33			
2.34 Our daily diet should include vegetable and starch only			
2.35 Vegetables cooked in just a little water will protect me against illness better than vegetables cooked for a long period in lots of water			
2.36 Brown sugar is better than white sugar			
2.37 Dried beans are a cheap alternative for meat			
2.38 It is not necessary to put a cloth or lid on a bucket of clean water			
2.39 I rather eat meat than cheese, because meat is healthier than cheese			
2.40 I only buy food that is cheap			
2.41 Fruits and vegetables will help build the body			
2.42 It is healthy to take alcohol drinks daily			

2.43 Drinking a lot of fruit juice is harmful to your body			
2.44 A healthy diet should include many foods containing a lot of sugar			
2.45 It is not healthy for you to eat a lot of fat			
2.46 Vegetables must be cooked in a lot of water for a long time			
2.47 Dried beans are just as healthy for the body as meat			
2.48 Starchy foods will supply energy to the body			
2.49 Our daily diet should include foods of one type e.g. starchy foods only			
2.50 Vegetables help protect my body against illness			
2.51 I put salt in all the foods that I cook			
2.52 Cooked vegetables must be left lying in water after they are cooked			
2.53 Water drawn from rivers, wells and dams has to be boiled before use			
2.54 Starchy food should fill a large portion of my plate			
2.55 It is healthier to eat an apple instead of sweets			

Thank you very much for participating in this interview.

KAROLO 1

Tshedimosetso ka lefelo

1.1 Nomore ya motsaya karolo

Letlha		
Interviewer	Researcher	1
	Mothusi	2

1.2 Strata

Rural		1
Urban formal		2
Urban informal		3
Farm		4

1.3 Dipotso

Baseline		1
End knowledge		2

1.4 Ka kopo dirisa letshwao la x fo go tshwanetseng

1. Leina

2. Ona le ngwaga tse kae?

10-20 dingwaga		1
21-30 dingwaga		2
31-40 dingwaga		3
41-50 dingwaga		4
51-60 dingwaga		5
61 go ya kwa godimo		6

3. Dithutego tsa gago/ Orutegile go fitlha kae?

Kwa tlase ga 3		1
Grade 4go ya go 6		2
Grade 7-go ya go 9		3
Grade 10 go y a go12		4
Go feta grade 12		5

4. Maloko a makae a o nnang le bona (go tsenyeletsa le wena)

Maloko a 2		1
Maloko a 3-5		2
Maloko a 6-8		3
Maloko a a fetang 8		4

5. Ke maloko a makae a losika ba o ba appelang ka latsatsi

Palo yotlhe	Bagolo	Bana

6. Maemo a gago a tiro?

Ga o dire		1
Tiro ya nakwana		2
Tiro e feletseng		3

7. Letseno la gago ka kgwedi?

Sepe		1
R1-R100		2
R101-R500		3
R501-R1000		4
R1001-R2000		5
R2001-R3000		6
More than R3001		7

8. Letseno lwa didiriswa tsa gago tsa ntlo ka kgwedi?

R1-R100		1
R101-R500		2
R501-R1000		3
R1001-R2000		4
R2001-R3000		5
More than R3001		6

9. A o na le motlakase ?

Eya		1
Nnyaya		2

10. Mokgwa wa tiriso ya metsi

Noka		1
Sediba		2
Pompo e dirisiwang ke botlhe		3
Metsi a amotankeng		4
Pompo ya mogae e kwa ntle		5
Pompo ya mogae e mo ntloung		6

11. Mokgwa wa tiriso ya go apaya dijo

Molelo wa dikgong		1
Parafine		2
Gase		3
Motlakase		4
Magala		5

KAROLO YA 2

DIPOTSO MABAPI LE MELAETSA YA DIJO TSE DINANG LE DIKOTLA

	Nnete	Maaka	Ga ke itse
2.1 Dijo tse disiameng di tshwantse go nna le mafura a mantis			
2.2 Ke rata go fa ba lelapa lame bogobe fela			
2.3 Go siame go nwa dino tsatsi lengwe le lengwe			
2.4 Go siame go nwa metsi ka metlha			
2.5 O tlhoka dijo jaaka bogobe kgotsa sengwe mo dijong dingwe le dingwe gonne di go fa maatla ka letsatsi.			
2.6 Ke tlwaetse go tshela letswai mo dijong tsa me dile mosejaneng			
2.7 Mmele wa gago o tlhoka nnotagi go nna o o itekanetseng			
2.8 Dijo tse di siameng ditshwanetse go nna le nama ya kgogo, kgomo, mae le tshisi ka bontsi			
2.9 2.8 Dijo tse di siameng ditshwanetse go nna le merogo le maungo ka metlha			
2.10 Go siame go nna mokima			
2.11 Re tshwanetse go tshela (bicarbonate of soda) fa re bedisa merogo e metala			
2.12 Ga go tlhokege go lekanya letswai fa o apaya			
2.13 Ke nagana gore dijo tse di siameng di tla nthusa gore ke seke ka lwala			
2.14 Dinawa di na le dikutla			
2.15 Go nwa metsi a mantis gago a siamela mmele wa gago			
2.16 Go siame go nna o le matlhagatlhaga			
2.17 Nama ya kgomo e siame go gaisa ya kgogo			
2.18 Dijo tse disiameng tsa ka metlha ditshwanetse gore di seka tsa tshwana			
2.19 Ditamati di na le dikotla tsa poroteine, ka jalo didirisiwa boemong jwa nama			
2.20 Go nna matlhagatlhaga ga go rae gore o itekanetse			
2.21 Ke rata go ja borotho jo bosweu go na le jo bo borokwa le fa bo re siametse			
2.22 Jaaka ke le mogolo, ga go tlhokege gore ke new maswi tsatsi le letsatsi			
2.23 Merogo e tshwanetse go bedisiwa go le gonnye ka nako e khutshwane			
2.24 Go ja dijo tse dintsi tse di nang le sukiri di tlile go go bolaisa meno			
2.25 Ga ke na sepe gore ba lelapa la me ba ja eng fela fa ba tlatsa dimpa			
2.26 Go nwa nnotagi e ntsi go senya mmele wa gago			
2.27 Nama, tlhapi le maswi di na le dikotla tsa poroteine tse dintsi			
2.28 Dinawa tse di omisitsweng ga di a tshwanelwa go jewa go feta gangwe ka beke			
2.29 Go ja mae go siame fela jaaka go ja nama			
2.30 Go siame go itlwaetsa go ja pakete ya disimba ka letsatsi			
2.31 Dinawa tse di omisitsweng di ka dirisiwa jaaka nama			
2.32 Ga go tlhokege go tshela mafur fa o apaya merogo			
2.34 Dijo tsa rona tsa ka metlha di tshwanetse go nna merogo le dijo tsa seteisele (starch)			

2.35 Merogo e e apeilweng ka metsei a manye e tla thusa kgatlhanong le malwetsi gona le a apeilweng sebaka ka metsi a mantis.			
2.36 Sukiri e e borokwa (brown) e siame go gaisa e tshweu			
2.37 Dinawa tse di omositsweng fi na le tlhwatlhwa e e kwa tlase go na le nama			
2.38 Ga go tlhokege go baya letsela mo kgamelong ya metsi			
2.39 Nkampa ka ja nama go na le tŝhisi ka gone nama e siame go gaisa			
2.40 Ke reka fela dijo tsa tlhwatlhwa e e kwa tlase			
2.41 Merogo le maungo di thusa go ag mmele			
2.42 Go itekanetse go nwa dinotagi ka letsatsi			
2.43 Go nwa seno sa maungo ga go a siamela mmele wa gago			
2.44 Dijo tse di itekanetseng di tshwanetse go nna le sukiri e ntsi			
2.45 Ga go a siama go ja mafura a mantsi			
2.46 Merogo e tshwanetse go bedisiwa sebaka se seleele			
2.47 Dinawa tse di omisitsweng di tshwanetse mmele fela aaka nama			
2.48 Dijo tsa seteisele (starch) di tla go fa maatla mo mmeleng			
2.49 Dijo tse dire tshwanetseng di tshwanetse go tshwana le sekai (dijo tsa seteisele fela)			
2.50 Merogo e thusa go sireletsa mmele wa me go lwantsha malwetse			
2.51 Ke tshela letswai mo dijong tsotlhe tse ke di apayang			
2.52 Merogo e e apeilweng e tshwanetse go tlogelwa mo metsing fa e sena go apewa			
2.53 Metsi a a tswang mo dinokeng, matamong a tshwanetse go bedisiwa pele			
2.54 Dijo tsa seteisele di tshwanetse go nna tse dintsi mo (sekotleleng) poleiti			
2.55 Go itekanetse go ja apole go na le dimonamone			

Thank you very much for participating in this interview.

ANNEXURE C

Food-Based Dietary Guidelines/Guide study: Focus Group: Topic guide

PHASE 1: Opening - 5 minutes

- Focus group moderator

- Introduce herself

- Thanks participants for coming

- Focus group moderator explains the general purpose of the group discussion.

- Today, I would like to speak to you about food. I am going to be asking a few questions and I am interested in your ideas and opinions about these questions. These questions will be about food and different nutrition messages.

- Focus group moderator explains the 'ground rules'.

- There are no rights or wrong answers.
- Participants are to speak one at a time
- Participants can disagree with one another, but should let others finish what they are saying- no interrupting

- Focus group moderator explains procedure.

- I am going to be asking general, broad questions that I'd like you to discuss. As we have a lot to get through.

I may change the subject to move ahead, but please feel free to stop me at any time if you want to add something.

- I would like to tape record the discussion as this makes it easier for me to remember what everyone has said. Would this be accepted to everyone here? Please remember that these tapes will be treated with confidentiality and will be erased when we have finished with them.

- Please do not feel intimidated by the tape-recorder. Please speak one at a time so that the tape recorder can pick up everything clearly.

- I also have an observer with me, his name is Sonnyboy Segoe, and he will be helping me with taking notes during the discussion.

- Our discussion will take about ± 2hours. We will have refreshments after the session.

PHASE 2: Ice breaker – 5minutes

- Everyone to introduce themselves (moderator to start).

- Use first letter of name to describe yourself.

- What work do you do?

- How many children do you have?

STARTER QUESTION 5-10

I would like to start today's discussion by asking you about yourself:

- How many people do you prepare/cook food for (children/adults)
- Who or what influences/decides what foods you should buy? e.g. Mother-in-law, or money.
- Who or what influences/decides how you should prepare/cook the food? e.g. children or time.

PHASE 3: MAIN DISCUSSION – 5 minutes per question

I am now going to ask you some specific questions about different nutrition messages

3.1 "Enjoy a variety of foods" (put up flash card)

- Have you heard or read this message before?

- What does this message say to you?
- What does the word, 'enjoy' means to you?

- What does the word 'variety' means to you? (Variety means eating as many different foods each day as you can afford)

- How can you and your family enjoy a variety of foods?

If YES - How do you do this?

If NO - Why do you say this?

What are some of your reasons for feeling the way you do?
(possible reasons - personal preference, cost, affordability, availability, convenience, time storage/ preparation facilities etc)
What do you mean by ... (ask for each reason given)
If you weren't, concerned about these, would you and your family enjoy a variety of foods? YES/NO

If YES -
If NO - Why do you say this? What do you mean by this?

- Why do you think it is important to enjoy a variety of foods? YES/NO

If YES - Why do you say this? What do you mean by this?
If NO - Why do you say this? What do you mean by this?

- How would you explain this message to your family

3.2 "Be active!" (put up flash card)

- Have you heard or read the message before?

- What does this message says to you?

- What does the word' active' means to you?

- (Active means doing some activity for at least 10 minutes that makes you puff and sweat)

- Are you and your family active? YES/NO

If YES - What makes you say this? What physical activities do you / does your family do?

If NO -Why do you say this?

What are some of your reasons for feeling the way you do?

(possible reasons- personal preference, cost, affordability, facilities, time, etc)

What do you mean by..... (ask for each reason given)

If you weren't concerned about these, would you and your family be active? YES/NO

If YES

If NO - Why do you say this? What do you mean by this?

- Why do you think it is important to be active?

If YES - Why do you say this? What do you mean by this?

If NO - Why do you say this? What do you mean by this?

- How would you explain this message to your family?

3.3 " Make starchy foods the basis of most meals" (put up flash card)

- Have you heard or read the message before?

- What does this message say to you?
- What do the words "starchy foods" means to you?
- (Starchy foods include foods like potatoes, mealie meal and bread)
- What does the word "basis" means to you?
- What does the word "meal" means to you?
- What "starchy foods" do you and your family usually eat? (put up food pictures)
- Do you have another name for these foods?
- Do you and you family make starchy foods the basis of most meals? YES/NO

If YES - how do you do this?

If NO - Why do you say this?

What are some of your reasons for feeling the way you do?

(possible reasons – personal preference, cost, availability, convenience, time etc)

What do you mean by ... (ask for each reason given)

If you weren't concerned about these, would you and your family make starchy foods the basis of most meal? YES/NO

If YES

If NO-Why do you say this? What do you mean by this?

- Do you think it is important to make starchy foods the basis of most meals? YES/NO

If YES - Why do you say this? What do you mean by this?

If NO - Why do you say this? What do you mean by this?

- How would you explain this message to your family?

3.4 "Eat plenty of vegetables and fruits every day" (put up flash card)

- What does the word" plenty" means to you?

- What "fruit" do you and your family usually eats? (put up food pictures)

- What "vegetables" do .you and your family usually eats? (put up food pictures)

- Do you and your family eat plenty of vegetables and fruits every day? YES/NO

If YES= How do you do this? ,

If NO = why do you say this?

- What are some of your reasons for feeling the way you do?

(possible reasons. personal preference, cost, availability, convenience, time etc)

What do you mean by (ask for each reason)

If you weren't concerned about these, would you and your family eat plenty of vegetables and fruits? YES/NO

YES

If NO - Why do you say this? What do you mean by this?

Do you think it is important to eat plenty of vegetables and fruits every day?
If YES - Why do you say this? What do you mean by this?
If NO - Why do you say this? What do you mean by this?

- How would you explain this message to your family?

3.5 "Chicken, fish, meat, milk or eggs could be eaten daily" (put up flash card)

- Have you heard or read the message before?

- What does this message say to you?

- What do the words "can be eaten every day" means to you?

- Do you have another name for these foods? (put up food pictures)

- Do you and your family eat chicken, fish, meat, milk or eggs? YES/NO

If YES - How do you do this?

If NO - Why do you say this?

What are some of your reasons for feeling the way you do?

(possible reasons –personal preference, cost, availability, convenience, time etc)

What do you mean by ... (ask for each reason given)

If you weren't concerned about these, would you and your family eat foods from animals every day? YES/NO

YES

If NO - Why do you say this? What do you mean by this?

- Do you think it is important that chicken, fish, meat, milk or eggs could be eaten daily? YES/NO

If Yes - Why do you say this? What do you mean by this?

If No - Why do you say this? What do you mean by this?

*How would you explain this message to your family?

3.6 "Eat dry beans, peas, lentils and soya regularly" (put up flash card)

- Have you heard or read the message before?
- What does this message say to you?
- What dry beans, peas, lentils or soya do you and your family usually eats? (put up food pictures)
- Do you have another name for these foods?
- Do you and your family eat dry beans, peas, lentils or soya regularly? YES/NO

If YES - How do you do this?

If NO - Why do you say this?

What are some of your reasons for feeling the way you do?

(possible reasons – personal preference, cost, availability, convenience, time etc)

What do you mean by...(ask for each reason given)

If you weren't concerned about these, would you and your family eat legumes regularly? YES/NO

YES

If NO - Why do you say this? What do you mean by this?

- Do you think it is important to eat dry beans, peas, lentils and soya regularly?

YES - Why do you say this? What do you mean by this?

NO - Why do you say this? What do you mean by this?

- How would you explain this message to your family?

3.7. "Use sugar and sugar-containing foods and drinks in moderation" (put up flash card)

- Have you heard or read this message before.
- What does this message say/ mean to you.
- What sugar and sugar-containing foods and drink do you and your family usually use? (put up food pictures).

* Do you and your family use sugar and sugar-containing foods and drinks in moderation? YES/NO

If YES - how do you do this?

If NO - why do you say this?

What are some of the reasons for feeling the way you do?

(possible reasons - personal reference, cost/ affordability, seasonality,

convenience, time, storage/ preparation facilities etc)

What do you mean by (ask for each reason given).

If you weren't concerned about these, would you and your family use sugar and sugar containing foods and drinks in moderation. YES/NO

YES

If NO - why do you say this? What do you mean by this? .

-Do you think it is important to use sugar and sugar-containing foods and drinks in moderation? YES/NO

If YES - why do you say this? What do you mean by this?

If NO - Why do you say this? What do you mean by this?

How would you explain this message to your family?

3.8 "Eat fats sparingly" (put up flash card)

- Have you heard or read the message before?
- What does this message say to you?
- What does the word "sparingly" means to you?
- Of the foods that you and your family usually eat, which ones do you think contains fats?

(fats include foods like margarine and oil) (put up food pictures)

- Do you and you family eat fat sparingly? YES/NO

If YES - How do you do this?

If NO - Why do you do this?

What are some of your reasons for feeling the way you do?

(possible reasons – personal preference, cost, availability, convenience, time etc)

What do you mean by.....(ask for each reason given)

If you weren't concerned about these, would you and you family eat fat sparingly? YES/NO

YES

If NO = Why do you say this? What do you mean by this?

- Do you think it is important to eat fats sparingly? YES/NO

If YES - Why do you say this? What do you mean by this?

If NO - Why do you say this? What do you mean by this?

- How would you explain this message to your family?

3.9 " Eat salts sparingly" (put up flash card)

Have you heard or read the message before?

- What does this message say to you?
- What does the word 'sparingly' means to you?
- Of the foods that you and your family usually eat, which ones do you think contains salts?
- (Salts include foods like salt and aromat) put up food pictures
- Do you and your family eat salt sparingly? YES/NO
- If YES - How do you do this?
- If NO - Why do you say this?
- What are some of your reason for feeling the way you do?

(possible reason-personal preference, cost, availability, convenience, time etc)

What do you mean by..... (ask for each reason given)

If you weren't concerned about these, would you and your family eat salt sparingly? YES/NO

YES

If NO - Why do you say this? What do you mean by this?

- Do you think it is important to eat salt sparingly? YES/NO

If YES - Why do you say this? What do you mean by this?

If NO - Why do you say this? What do you mean by this?

- How would you explain this message to your family?

3.10 "Drink lots of clean safe water" (put up flash card)

- Have you heard or read the message before?
- What does this message say to you?
- What does the word 'lots' means to you?
- From where do you and your family get your drinking water?

- Do you and your family drink lots of clean safe water? YES/NO
- If YES - How do you do this?
- NO
- How many cups/ glasses of water do you/ family members drink each day?
- What else do/family members drink during the day (put up food pictures)

- What are some of your reasons for feeling the way you do?

(possible reason-personal preference, cost, availability, convenience, time storage/ preparation facilities etc)

What do you mean by... (ask for each reason given)

If you weren't concerned about these, would you and your family drink lots of clean safe water? YES/NO

YES

If NO - Why do you say this? What do you mean by this?

- Do you think it is important to drink lots of clean safe water? YES/NO

If YES - Why do you say this? What do you mean by this?

If NO - Why do you say this? What do you mean by this?

How would you explain this message to your family?

3.11 " If you drink alcohol, drink it sensibly" (put up flash card)

- Have you heard or read the message before?
- What does this message say to you?
- What does the word 'alcohol' means to you?
- What does the word 'drink sensibly' means to you?
- Do other people living with you drink alcohol
- Who?
- What do you think the words 'drink sensibly' would mean to them?
- What do / other people living with you drink that contains alcohol (put up food pictures)

- Would you say that you/other people living with you who drink alcohol, drink it sensibly? YES/NO
- If YES - Why do you say this?
- If NO - Why do you say this?
- What are some of your reasons for feeling the way you do?

(possible reason-personal preference, cost, availability, convenience, time storage/ preparation facilities etc)

What do you mean by..... (ask for each reason given)

- Do you think it is important to drink alcohol sensibly if you are drinking it? YES/NO

If YES - Why do you say this? What do you mean by this?

If NO - Why do you say this? What do you mean by this?

How would you explain this message to your family?

PHASE 5: SUMMARY 10 MINUTES

(Allow participants to alter, clarify, and add on their previous opinion)

If I understand you correctly, you feel that the message:

- "Enjoy a variety of foods" means...(summary of discussion)
- "Be active" means...(summary of discussion)
- "Make starchy food the basis of most meal" means...(summary of discussion)
- "Eat plenty of vegetables and fruits every day" means...(summary of discussion)
- "Chicken, fish, meat, milk and eggs could be eaten every day" means...(summary of discussion)
- "Eat dry beans, peas, lentils and soya regularly" means...(summary of discussion)
- "Use sugar and sugar-containing foods and drinks in moderation" means...(summary of discussion)
- "Eat fats sparingly" means...(summary of discussion)
- Eat salt sparingly" means...(summary of discussion)
- "Drink lots of clean safe water" means...(summary of discussion)
- If you drink alcohol, drink it sensibly" means...(summary of discussion)

- **THANK YOU - 5 MINUTES**
- **REFRESHMENTS**

ANNEXURE D

Questions for each guideline

1. Enjoy a variety of food

    6 questions: 13, 18, 25, 34, 40 & 49

2. Be active

    2 questions: 16 & 20

3. Make starchy foods the basis of most meal

    5 questions: 2, 5, 21, 48 & 54

4. Eat plenty of vegetables and fruits every day

    10 questions: 9, 11, 19, 23, 35, 41, 43, 46, 50 & 52

5. Eat dry beans, peas, lentils and soya regularly

    5 questions: 14, 28, 31, 37 & 47

6. Chicken, fish, meat, milk and eggs could be eaten everyday

    6 questions: 8, 17, 22, 27, 29 & 39

7. Use sugar and sugar-containing food and drinks in moderation

    5 questions: 3, 24, 36, 44 & 55

8. Eat salt sparingly

    4 questions: 6, 12, 30 & 51

9. Eat fats sparingly

    4 questions: 1, 10, 32 & 45

10. Drink lots of clean safe water

    4 questions: 4, 15, 38 & 53

11. If you drink alcohol, drink sensibly

    3 questions: 7, 26 & 42