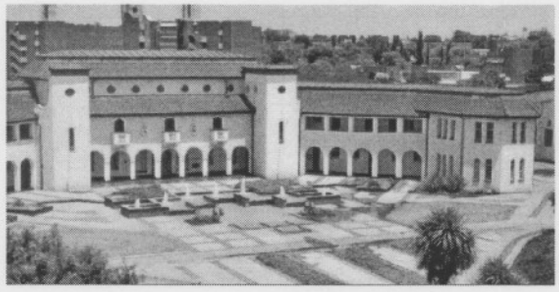
THE DEVELOPMENT OF NUTRITION KNOWLEDGE AND GOOD DIETARY PRACTICES AMONG FARMDWELLERS.



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THE DEVELOPMENT OF NUTRITION KNOWLEDGE AND GOOD DIETARY PRACTICES AMONG FARM DWELLERS

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ABSTRAK

DIE ONTWIKKELING VAN KENNIS EN VOEDINGSSPRAKTYKE IN PLAASEBEWONERS.

Agtergrond

Swak lewenskwaliteit onder plaasbewoners is 'n algemene verskynsel in die Noordwes Provinsie van Suid Afrika. Plaasbewoners is 'n behoeftige groep mense wat in armoede plase bewoon, met in hoë siektesyfer wat hoë eise aan die openbare gesondheidsdiens stel. Die groepe is uiters kwesbaar ten opsigte van hulle voedingstatus en geestesgesondheidsprofiele. Daar is 'n hoë voorkoms van ontoereikende dieetinnames asook voedingsverwante siektes en toestande (Vorster *et al.*, 2000; London *et al.*, 1998). MacIntyre *et al.*, 2002 het bevind dat hierdie groep mense onderworpe is aan 'n groot mate van voedsel insekuriteit en dat hulle inname van vrugte en groente oor die algemeen veel minder as die aanbevole dieetriglyne is.

Omdat plaasbewoners arm is en geïsoleerd lewe as gevolg van menigte strukturele en sosio-ekonomiese probleme, is dit vir hulle moeilik om gesonde eetgewoontes te handhaaf. Om hierdie probleem sowel as die probleem rondom voedselsekuriteit aan te spreek, kan die vestiging van groentetuine veral vir eie verbruik, aanbeveel en bevorder word (Ewing, 1998, Love & Sayeed, 2001).

Walker *et al.*,(1992) beweer dat daar 'n gebrek aan inligting en kennis aangaande normale groei en ontwikkeling van die mens in ontwikkelende gemeenskappe bestaan. Hierdie gebrek aan kennis met gepaardgaande armoede het 'n problematiese impak op mense se gesondheid en voedingstatus (Greyvenstein *et al.*, 1999). Gesondheid kan dus per implikasie verbeter word deur voedings- en gesondheidsvoorligting. Wanneer hierdie voorligtingsproses gekombineer word met aktiewe deelname is die kans op sukses soveel beter (Walker *et al*, 2001; van Rooyen & Nene, 1996).

Dit is dus noodsaaklik om geskikte intervensie programme te ontwikkel en te implementeer ten einde 'n beter lewenskwaliteit vir persone wat in armoede leef te skep (Greyvenstein *et al.*, 1999; O'Neil & Viljoen 2001; Vorster *et al.*, 2000).

Doelwitte

Die hoofdoelwitte vir die studie was die:

- Bevordering en ontwikkeling van groentetuine in plaasgemeenskappe
- Ontwikkeling van 'n opvoedkundige program vir plaasbewoner vrouens en kinders ten einde kennis aangaande voeding en voedingspraktyke te bevorder en te verbeter.

Studie ontwerp

Dit was 'n intervensiestudie met voor en na metings. Dit was deel van die FLAGH-program (Farm Labour And General Health-program), 'n intervensieprogram binne die Fakulteit Gesondheidswetenskappe aan die Noordwes Universiteit, Potchefstroomkampus wat ten doel het om die lewenskwaliteit van plaasbewoners te bevorder.

Proefpersone:

'n Totaal van 132 laerskoolkinders tussen die ouderdomme 8-16 jaar het deelgeneem aan die studie. Van die ouers/versorgers van hierdie kinders het 24 vrouens, waarvan 19 die studie voltooi het, deelgeneem.

Navorsingsmetodiek

- Gestandardiseerde gestuktureerde vraelyste is gebruik om die proefpersone se kennis aangaande voedingaspekte te toets
- Fokusgroepbesprekings is gebruik om insig te verkry aangaande die hindernisse en faktore wat voedsel-inname in die plaasgermeenskap beinvloed.

Resultate

<u>Kinders</u>

Basislyn resultate het getoon dat daar geen prakties betekenisvolle verkille in die kennisvlakke van die kinders aangaande voedingsaspekte was tussen die intervensie-en die kontrole-skole nie. Daar is wel 'n toename in kennis binne die groepe in die intervensieskool gevind wat in die praktyk van belang kan wees. Die misbruik van alkohol, persoonlike voorkeure, verwaarlosing en die koste van voedsel was as hindernisse vir gesonde voedingspraktyke aangevoer.

Vrouens

Alhoewel die intervensieprogram 'n verbetering in voedingskennis getoon het, was daar 'n indikasie dat, addisioneel tot probleme met betrekking tot infrastruktuur en isolasie, sosio-ekonomiese probleme soos alkohol-misbruik die toename in kennis beperk het. 'n Faktor wat ook aangespreek behoort te word binne die gemeenskap is die besluitenemigsmag wat deur die gemeenskap ervaar word. Dit tesame met koste van groente, geslag diskriminasie en persoonlike voor-en afkeure is gevind die vernaamste faktore te wees wat die inname van groente beïnvloed het.

Gevolgtrekking

Kennis aangaande die gebruik van groente en die inname daarvan kan wel deur voedings-voorligting programme verbeter word. Die kultuur van plaaslewe sowel as the komplekse psigo-sosio-ekonomiese omgewing waarin die gesinne hulle bevind, het egter 'n groot bepalende invloed op die dieet wat hulle volg. Om dus kennis aangaande voedingspraktyke in isolasie aan te spreek, het minimale impak.

Aanbevelings

'n Holistiese benadering word benodig ten einde die lewenskwaliteit van plaasbewoners te verbeter. Die daarstelling van infrakstruktuur en sosiale dienste word benodig. Verdere navorsing word aanbeveel om die impak van groentetuine op kennis en dieetpraktyke vas te stel, nadat die sosio-ekonomiese probleme aangespreek is.

ABSTRACT

THE DEVELOPMENT OF NUTRITION KNOWLEDGE AND GOOD DIETARY PRACTICES AMONG FARM DWELLERS

Background

The poor quality of life among farm dweller households is a phenomenon in the North West Province of South Africa. Farm dwellers are a marginalized group, living in poverty on farms with a high disease burden, and their health needs represent formidable challenges to public health professionals. They are a vulnerable group with poor nutritional status and mental health profiles. The prevalence of nutritional intake inadequacies and nutrition related diseases and conditions among them are high. This affects the quality of their life (Vorster *et al.*, 2000; London *et al.*, 1998).

People living in poverty, such as farm dwellers, find it difficult to employ healthy eating practices. There is a high level of food insecurity and financial constraints. Their overall intake of fruit and vegetables is inadequate and fall below the recommendation (MacIntyre *et al.*, 2002). In these instances, increasing such consumption among farm dwellers may need to involve promoting and establishing vegetable gardens for self-reliance and food security (Ewing, 1998, Love & Sayed, 2001).

Furthermore, it is asserted that among developing populations there is generally a lack of information on growth and health issues (Walker *et al.*, 1992). This gap in knowledge and poverty make nutrition and health issues a problem (Greyvenstein *et al.*, 1999) and can be improved if nutrition theory and other health recommendations are accompanied by action through a learner participatory process (Walker, 2001; van Rooyen & Nene, 1996).

It is thus necessary to develop and implement appropriate intervention programs for the promotion of a better quality of life, especially for people living in poverty (Greyvenstein *et al.*, 1999, O'Neill & Viljoen, 2001, Vorster *et al.*, 2000).

Objectives

The main objectives of this study were to:

- Promote and establish vegetable gardens in farming communities, and
- Develop an education programme and use it to educate women and children using the vegetable garden as a point of reference to enhance nutrition education.

Setting and subjects

The study took place in the North West Province in the Potchefstroom district among a farming community. Two farm schools participated in the study, one as an intervention school and the other as a control school. A total of 132 primary school children, aged 8-16 years, took part in the study. Twenty-four women participated at baseline of which 19 completed the study protocol.

Study Design

The study was part of the Farm Labourer And General Health programme of the North-West University (Potchefstroom Campus). It was an intervention study with baseline and end measurements.

Research Methods

- Questionnaire interviews were carried out to elicit information related to nutrition knowledge.
- Focus group discussions were undertaken to gain insight into perceived barriers and factors that influence consumption among a farming community

Results

Children

A total of 132 children, aged 8-16 and in grades 2-6, completed the study protocol. More than 80% of the children came from labouring families. Baseline results indicate no practical significant difference in nutrition knowledge between the intervention school and the control school. However, increase in knowledge within the intervention school and between groups was large enough to be of importance in practice. There was a tendency of practical significance. The abuse of alcohol, food-related domestic disputes, negligence, and cost were presented as barriers to sound dietary practices.

Women

A total of 19 women completed the study protocol. They were aged 20-50 years. Although the education programme indicated improvement on nutrition knowledge, there were indications of the need to address the practical psycho-socio-economic problems experienced by this community in addition to the problems of infrastructure, isolation, behaviour associated and related to alcohol consumption, and decision making. Cost, likes and dislikes, preferences, and gender among this community were considered as factors that influence vegetable consumption.

Conclusion

Nutrition knowledge and knowledge of good dietary practices is more likely to improve through nutrition education programmes. However, the culture of farm life and complex psycho-socio-economic issues is viewed as barriers and determinants of consumption. Thus, promoting nutrition education in isolation among this group may be a fallacy. A holistic approach is advocated for.

Recommendations

A multifaceted approach is needed to improve the quality of life among farm dwellers. There is need to establish infrastructure and social services. Further research on the impact of food gardens on the nutrition knowledge, nutritional status, and dietary practices when psycho-socio-economic problems are lessened, is recommended. Practical implementations of policies and support structures tailored to the welfare of farm workers needs to be addressed.

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ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
CEDAW	Convention on the Elimination of all forms of Discrimination Against Women
CGE	Commission on Gender Equality
ESTA	Extension of Security of Tenure Act
FLAGH	Farm Labourer And General Health
HIV	Human Immunodeficiency Virus
PU FOR CHE	Potchefstroom University for Christian Higher Education
RDA	Recommended Daily Allowance
SD	Standard Deviation
SAHRC	South African Human Rights Commission
SARPN	Southern African Regional Poverty Network
TB	Tuberculosis
UNICEF	United Nations Children's Fund
WHO	World Health Organisation

CHAPTER 1

General Introduction

1

GENERAL INTRODUCTION

1.1 Background

The contribution of nutrition knowledge and sound dietary practices to the growth, development, and quality of life of an individual is well documented in nutrition and economic development literature with some of the literature providing direct evidence of the role of nutrition knowledge. Nutrition knowledge has been cited as one of the facilitating factors in achieving prevention and reduction of ill-health (Larsson *et al.*, 1999; Greyvestein *et al.*, 1999), particularly in cancer and coronary heart diseases (CHD), non–insulin dependent diabetes mellitus (WHO, 1990; Larsson *et al.*, 1999:776; Dibsdall *et al.*, 2002:159), iodine and vitamin A deficiencies (WHO, 2000; Kidala *et al.*, 2000; Faber *et al.*, 2002), and malnutrition (UNICEF, 1993; UNICEF, 1990). As a result, analysts have identified nutrition education as an important determinant of well-being (Blaylock *et al.*, 1999). Kruger & Gericke (2003) argue that inadequate nutrition knowledge and the habit of clinging to cultural norms and practices lead to poor quality eating practices.

There is increasing evidence that nutrition knowledge and dietary practices impact on the health status of an individual. Nutrition knowledge may influence food selection. Armed with nutrition knowledge, people are more likely to choose wholesome and healthier alternative food items that lead to nutritional well-being. It is assumed that given accurate information about food consumption and the implications of health, people will change their diets accordingly (Larsson & Lissner, 1996:780; Parmenter & Wardle, 1999:298). However, it is recognized that nutrition knowledge in some instances does not constitute behavioural change. It has been demonstrated that nutrition knowledge and attitudes have little or no impact on some nutrient intake, in particular on messages regarding fat intake (Stafleu, 1996:38; Larsson *et al.*, 1999:780; Larsson & Lissner, 1996:327). For example, an encouragement of low fat intake to promote a healthy heart does not encourage consumption of fruit and vegetables. According to Dixon *et al.* (2000) nutrient intake is dependent on the promotion strategies used.

Dietary selection behaviour is viewed as dependent on various social factors such as level of education, income, and availability of food alternatives. It is assumed that a store of information and experiences may allow one to make correctly informed nutritional choices, which will be determined by financial affordability and the availability of shopping centers or means of acquiring the food items. Thus, the practical application of nutrition information and knowledge is seen as dependent on other factors (Larsson & Lissner, 1996:323).

It has been suggested that early food choices may establish habitual patterns, which may, in turn, influence food choices in childhood and adolescence (Stafleu *et al.*, 1996:33-34; UNICEF, 1993; Owen *et al.*, 1997; Blaylock *et al.*, 1999) and may significantly influence the probability of certain chronic diseases in the future (Blaylock *et al.*, 1999). Eating habits are learned and intensified during childhood and adolescence and become the norm in adulthood (Lytle, 2002:s11; Blaylock *et al.*, 1999). Thus, it is easier to change dietary habits at a young age than in adulthood (Larsson & Lissner, 1996:326). This makes children a suitable group for nutritional education as they are eager to practice what they learn (Bellamy, 1997).

From a study on nutrition knowledge and attitudes towards high-fat foods and low-fat alternatives in three generations of women, mothers and their adult daughters had similar nutrition knowledge and attitudes. It is argued that if socialization of food habits takes place in a family context, it is expected that children will have similar nutrition habits to their parents as nutrition knowledge and attitudes have been shown to pass from mother to daughter (Stafleu *et al.*, 1996:38). This has implications for nutrition knowledge and its application at an early age.

It has also been contested that a mother's nutrition knowledge has much impact on the diet quality of pre-school children and that impact seems to decline in school-going children (Blaylock *et al.*, 1999). This makes mothers and school going children an important population for nutrition education.

Generally, women hold nurturing and caring roles in a family context. They are responsible for the prevention and management of diseases and household food security. Their lack of nutrition education is often seen as an underlying cause of malnutrition in children. By improving their welfare and education levels, disease management, food security, and family welfare are likely to improve (WHO, 1990). It is assumed that educating women on nutrition and health issues will ultimately lead to an improved diet for the whole family as they will make healthier choices (Parmenter & Wardle, 1998:298).

Given the importance of providing information and nutrition knowledge among women and children, it is necessary to implement intervention programmes based on what they know to develop nutrition knowledge and good dietary practices for the nutritional well being of the individual and the whole family. This may help both mothers and children comprehend the basic principles, apply them, and establish sound eating habits. Ultimately, the quality of life may improve.

1.2 PROBLEM STATEMENT

The Transition, Health and Urbanization in South Africa (THUSA) study identified the farm dwellers in the North West Province as an extremely vulnerable group judging by their poor nutritional status, physical and mental health. They live in poverty in farms with a high disease burden and poor mental health profiles. The prevalence of inadequate nutrient intakes and nutrition-related diseases and conditions is high among them (Vorster *et al.*, 2000).

Farm dwellers' consumption of fruit and vegetables have been found to be low. Their overall intake of fruit and vegetables is inadequate and their micronutrient intakes fall below the Recommended Daily Allowances (RDA's) (MacIntyre *et al.*, 2002). They are dependent on employment by farm owners for their livelihoods. The children suffer before birth and start life disadvantaged because of their mothers' poor nutrition status during pregnancy. They are born nutritionally poor and into poverty. The cycle of poverty is inevitable. They have little resources, poor living conditions, and are dependent on the farmer (UNICEF, 1993). It has been argued that socio-economically disadvantaged groups lack knowledge and skills on health issues (Greyvestein *et al.*, 1999).

1.3 SIGNIFICANCE OF THE STUDY

Generally, all sectors of health are challenged by the needs of the farm dwellers, especially women and children. Educating them on nutrition and health issues may improve their general quality of life. There is need to establish vegetable gardens and disseminate nutrition information. This may make low-cost food available and accessible as well as contribute to household food security. An increased acquisition of nutrition knowledge and acquired related skills may impact on the practical application of the nutrition knowledge of both women and children on dietary practices. This may improve the development, growth, education attainment, and the nutritional practices/choices the children may make in the future. The women also may use their knowledge to influence change within the family and make better food choices. This may improve the general health of household members.

1.4 AIMS, OBJECTIVES AND HYPOTHESIS

1.4.1 Aim

The aim of this study is embedded within the general goal of Farm Labourers And General Health (FLAGH) programme, which is to improve the quality of life of farming communities. Thus, this study intends to improve nutrition knowledge and knowledge of good dietary practices

among farm dwellers. It will mobilize and organize women and primary school children in the North West Province through a skill-based, educational vegetable gardening project to improve their knowledge on nutrition and dietary practices. This may lead to better nutrition, more sound dietary practices, and improved quality of life.

The following hypothesis is formulated: education improves the nutrition knowledge and knowledge of healthier dietary practices/choices among children and women living on commercial farms.

1.4.2 Objectives

The specific objectives of the study were to:

- Promote and establish vegetable gardens among farm dwellers;
- Obtain data on current nutrition knowledge, vegetable gardening, and dietary practices among women and children in a farming community
- Develop an educational nutrition intervention programme for use among farm-dwelling women and children, to educate them on nutrition related issues;
- Evaluate the impact of the intervention on the nutrition knowledge and self-reported dietary practices among farm dwellers;
- Explore barriers and factors to sound dietary practices among farm workers.

1.5 OUTLINE OF THE DISSERTATION

Chapter 1 covers the general statement of the problem, the significance of the study, research aims, objectives and hypothesis. Chapter 2 provides a review of literature, which focuses on previous research and opinion and gives an interpretative summary of the current state of knowledge about farm dwellers. Chapter 3 contains a research paper describing the methods, results and implications of the intervention study undertaken with primary school children from farm dweller communities. Chapter 4 presents a research paper describing methods, locations, results and implication of the intervention study undertaken with women on farms. As the methodologies of the two studies are presented in the papers, no separate chapter on methodology is presented. Finally, chapter 5 overviews the study through conclusions and recommendations.

The relevant references of Chapters 3 and 4 are written up according to the instructions of the specific journal to which the manuscripts were submitted and prepared for submission respectively. The references of Chapters 1, 2, and 5 are according to the guidelines of the quoting sources (van der Walt, 2004) of the North-West University (Potchefstroom Campus).

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CHAPTER 2

Review of relevant literature

2

LITERATURE REVIEW

2.1 INTRODUCTION

There is a general lack of information on growth and health issues among developing populations (Walker *et al.*, 1992) and this gap in knowledge and poverty make nutrition and health issues a problem (Greyvenstein *et al.*, 1999). Considerable evidence exists that nutrition information and knowledge have a powerful influence on feeding practices and eating behaviours (UNICEF, 1993; Stafleu *et al.*, 1996; Larsson & Lissner, 1996; Larsson *et al.*, 1999; Lytle, 2002; Blaylock *et al.*, 2003). According to Fischer *et al.* (1991), nutrition knowledge, attitudes, and practices play an important role in establishing sound dietary practices at an early age.

Farm workers in South Africa are an economically and socially disadvantaged group. Their environment has been characterized by extremely poor living and working conditions. These range from low wages and associated poverty, inadequate housing, poor sanitation, inadequate water supplies (Waldman, 1994; Davies, 1990; Segal, 1991), lack of hygiene, malnutrition and spouse abuse (Naude *et al.*, 1998), to paternalistic and coercive labour relations (Segal, 1991; Waldman, 1994).

The closed nature of farming communities, their low levels of education, lack of amenities, and social services locks them into a cycle of poverty and dependence (Davies, 1990; Hill, 1994; Waldman, 1994; Department of Labour, 2001; Segal, 1991). The most vulnerable are women and children. Most live in farms through an attachment to male labourers. As a result, they endure economic and social deprivation (Waldman, 1994; Davies, 1990; Ball, 1990), and it is likely that children of farm workers will become farm workers themselves (UNICEF, 1993; Hill, 1994).

This review will give an interpretative summary of the current state of knowledge in relation to the status of farm workers in South Africa and the potential of vegetable gardening in addressing their nutrition and health problems.

2.2 GENERAL STATUS OF FARM LIFE

2.2.1 Introduction

Following the new constitution in South Africa in 1994, laws advocating for a change in the status of farm workers have been drawn to protect the farm dweller from continuos evictions, human rights abuse, a biased criminal justice system and lack of tenure security. Legislation to protect tenure rights to farm dwellers and to secure labour rights to farm workers has been drawn. For example, the Extension of Security of Tenure Act (ESTA) no.62 was passed in 1997 to protect the farm dweller and promote security of tenure. The provisions of the Labour Relations Act of 1996, the Land Reform (Labours Tenants) Act of 1996, the Basic Conditions of Employment Act of 1997, the Employment Equity Act of 1998, the skills Development Act of 1999 apply to farm workers as well and grant rights over overtime pay, written contracts, sick leave and other protections.

2.2.2 Nature of farm life

From the point of legislation, people working on farms have power or control over their lives. However, many work practically under paternalistic and coercive labour relations. They experience physical and psychological abuse from farm owners, managers, or family members of farm owners. At times they are struck with fists, pushed, shoved, kicked, and/or threatened, at times with guns (Robins *et al.*, 1998). They rely on the farmer for all the basic neccessities (Mngxitama, 2001).

Geographically, farm workers are isolated from the rest of the society. They stay a distance away from amenities, and transport is usually a problem. Farm owners have control over almost every aspect of their lives. The results of a recent report by the South African Human Rights Commission (SAHRC) reveals brutal living and working conditions, frequent evictions and physical assaults as characteristics of the lives of many farm workers. Most farm workers have spent a large proportion of their lives resident on a farm and most farm workers parents were employed as farm workers themselves (London *et al.*, 1998a: 1100).

Despite government commitment to the farm dweller, their provision of labour defines access to housing, food, schooling and to health care (Mngxitama, 2001). Most farm workers are faced with substandard living conditions (Robins *et al.*, 1998:1123), with poor sanitation, and inadequate water supplies (Schenker, 1998:1096). They work longer hours than the legal limit with little to no compensation (London *et al.*, 1998a:1100; Dept of Labour, 2001). They are considered more as *tools of production* than members of a community (Schenker, 1998: 1091).

The majority are not provided with personal protective clothing or other hazard prevention measures. They often experience health problems related to their jobs (Robins *et al.*, 1998:1123) like occupational hazard dermatitis, eye problems, respiratory problems, and traumatic injuries (Schenker, 1998:1091, Robins *et al.*, 1998:1120). Women on farms are economically and socially exploited (Hill, 1994). In most cases, they stay and work on farms as an attachment to male employment and experience 'dual patriachy' (Lanz, 1995) and often bear the brunt of their partner's alcohol abuse (Naude *et al.*, 1998:1104). This takes place despite government ratification to the Convention on the Elimination of all Forms of Discrimination Against Women (CEDAW) in 1996 (Sunde & Kleinbooi, 1999).

2.2.3 Payment

Farm workers in South Africa have the lowest wages in the labour force, with females paid less than males irrespective of their educational status (Robins *et al.*, 1998:1123; Naude *et al.*, 1998:1104; Vorster *et al.*, 2000:509; London *et al.*, 1998b: 1096; Dept of Labour, 2001:5). For instance, most women farm workers in the Western Cape do not have employment contracts or benefits such as housing. They are dependent on both the male partner and the employer (Lanz, 1995). Around 1998, daily wages of sugarcane farm workers in Kwa-Zulu Natal were in the range of R5.00-R7.64 (Robins et al., 1998: 1123). The North West Province had generally a monthly income less than R1000 with a few earning R100 a month (Vorster *et al.*, 2000:509; Dept of Labour, 2001:38). These meagre wages were and are inadequate to support an individual much less a family even if supplemented with food items or housing in kind (Department of Labour, 2001). In trying to redress the imbalances, the Department of Labour has set the minimum wage for farm workers at R650 a month. In addition, the government in 1996 formally approved the CEDAW and established an independent statutory Commission on Gender Equality (CGE) (Sunde, & Kleinboi, 1999).

2.2.4 Dietary practices and nutritional status

People living on farms are usually food insecure. Women and children often experience chronic undernutrition (London *et al.*, 1998b: 1099; Davies, 1990:16; Naude *et al.*, 1998:1103) and children living on farms are more likely to be stunted and underweight than any other children (Department of Labour, 2001:25). Their intake of fruit and vegetables is low. The intakes of vitamins A and C among farm workers in the North West Province have been reported to be lower relative to recommendations (MacIntyre *et al.*, 2002:243).

According to Coutsoudis *et* al., (2000), hunger and malnutrition stem from insufficient, unstable food supplies of the household and intra-household level and their lack of purchasing power. Malnutrition hinders children's physical and mental development in addition to rendering the children more susceptible to diseases and illness. They therefore fail to realize their full potential. In addition to poor food security, malnutrition is also caused by the following factors: lack of diversity in children's diets, limited nutritional knowledge, inadequate health care for mothers and children, limited access to clean water and sanitation facilities, poor hygiene, and inadequate breast feeding practices. A WHO task group, (2000) asserts that, tragic consequences of malnutrition may lead to death, disability, and stunted mental and physical growth. Furthermore, Prinsloo and Pienaar (2003) concluded that the level of physical activity does not influence developmental co-ordination disorder in farm children, but that nutritional status might be the main influential factor. Mngxitama, (2001) asserts that government interventions on poverty through feeding schemes are devoid of the holistic nature of human need.

From conception, throughout the fetal period and into early infancy, intrauterine nutrition has profound influence on growth, development, morbidity and mortality, brain damage, growth failure, mental capacity in childhood, low birth weight, brain damage, delayed growth spurt, stunted height, delayed /retarded intellectual development and increased risk of infection (WHO, 2000; Coutsoudis *et al.*, 2000).

The cost of poverty and food insecurity among farm dwellers is high. It is generally accepted that in South Africa there is national food security but not household food security (Dept. of Agriculture, 2002:16). A household is considered food secure *when all people, at all times have physical, social, and economic access to sufficient, safe, and nutritious food which meets their dietary needs and food preference for an active and healthy life* (WHO, 2000; Coutsoudis *et al.*, 2000:1).

2.2.5 Educational level

Generally farm workers have the lowest rates of literacy (Hall *et al.*, 2001) with 33% having no formal education (Dept. Labour, 2001). This often hinders occupational mobility and job opportunities outside the farming sector (Robins *et al.*, 1998; Dept of Labour, 2001; London *et al.*, 1998b:1094). There is generally a lack of preschool facilities and child labour is often rife (London *et al.*, 1998b:1093). This locks children into a cycle of poverty and marginalisation (London *et al.*, 1998b:1093; Dept of Labour, 2001: 2). Segal (1991) argues that children of farm worker families are drawn into the labour force regardless of their age, abilities or their educational inclinations.

2.2.6 Medical care

The general health status among farm workers in South Africa is low. Poor hygiene creates conditions for infectious diseases. They have limited access to health care (Schenker, 1998:1091) and monthly mobile clinic visits are unreliable (Waldman, 1994). In most cases employers do not recognize the sick notes from the workers' own doctors and, where the farmer employs doctors and nurses, the workers are frequently sent back to work while still ailing. This increases the likelihood of their health problems worsening or taking longer for recovery. Those who refuse to work are often dismissed and required to leave the farm (Robins *et al.*, 1998:1124) and they experience difficulties of having no land of their own (Ball, 1990; Waldman, 1994). The FLAGH pilot study at Rysmierbult (North West Province) found that some farm workers were not aware of the health sector services of a mobile clinic in their area nor what the service offered. They indicated that there was a lack of health education provided and, when given, it mainly focused on curative aspects of health. The school health education rendered was mainly on oral health, ears, puberty and sex education (Du Plessis & Pienaar, 2002).

2.2.7 Risk behaviours

Despite the abolishment of payment with alcoholic drinks, the 'dop or tot system', the abuse of alcohol is still rife in the farming communities and there is a high rate of smoking. People are addicted to alcohol (London *et al.*, 1998a). This is often seen as a contributing factor to their poverty and dependence. Farm workers experience alcohol related trauma, have high rates of tuberculosis (TB), child and adult malnutrition, and fetal alcohol syndrome as women do not often understand the risks associated with alcohol abuse during pregnancy. In addition, they experience social problems such as verbal abuse, physical violence, and family disruptions (London *et al.*, 1998a). There are indications that risk behaviours associated with HIV/AIDS are prevalent among farm workers (Vorster *et al.*, 2000).

2.3 THE POTENTIAL OF VEGETABLE GARDENS

According to van Rooyen (1996), vegetable gardens are essential nutritional resources to rural communities and people living in poverty. They can close the food insecurity gap at the household level and the surplus can be a source of income. It is accepted that food insecurity and financial constraints need to be directed to promoting and establishing vegetable gardens for self- reliance and food security (Ewing, 1998; Love & Sayed, 2001; Vorster & Venter, 1992). The ideology is based on the expectation that the practice will empower people to take responsibility and accountability for their own situation (van Rooyen & Nene, 1996) and live

dignified lives, contributing to their own development and the improvement of the quality of their lives (Hart, 1997; Kupka, 2002).

There is a strong relationship between child nutrition and crops grown by households (Kirsten *et al.*, 1998) dependent on consumption levels, general dietary norms, and practices of the households (Webb, 2000). However, documented research on the promotion of agricultural production on the basis of nutrition and or dietary grounds is scarce.

2.4 Conclusion

Farm dwellers rank as the poorest in South Africa in terms of many development indicators including cash income, education level, nutritional status, and health care. The plight of farm workers is multi-dimensional. They find themselves socially isolated. Their social, health, educational, and economic welfare needs are remarkably compelling. In some instances they are paid low wages and live in substandard accommodation. Their educational level is meagre or absent. Most have little or no access to amenities, have no power to influence change in their working environment, and have no control over their lives. This scenario reinforces hopelessness, anxiety and stress. Although legislation changed to their benefit, they still experience minimal to no benefit. They still remain isolated. To compound the situation many farm schools have been closed down due to financial constraints.

Despite government formal commitment to the plight of farm dwellers, children and women on farms still face serious obstacles to general development and opportunities.

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CHAPTER 3

Nutrition knowledge and barriers to good dietary practices among primary school children in a farming community

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NUTRITION KNOWLEDGE AND BARRIERS TO GOOD DIETARY PRACTICES AMONG PRIMARY SCHOOL CHILDREN IN A FARMING COMMUNITY: THE FLAGH PROGRAMME.

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ABSTRACT

This paper examines the contribution of a nutrition education programme to the nutrition knowledge of black African children attending farm schools. The research was a controlled intervention study within the Farm Labourer And General Health (FLAGH) project of the North-West University. Two schools participated in the study. At both intervention and control schools, a vegetable garden was established. Additionally, a nutrition education programme was implemented at the intervention school. A total of 132 primary school children, aged 8-16 years, took part in the study. A structured questionnaire was used at baseline and end to provide insight into the children's knowledge on nutrition related issues. Focus group discussions were conducted to gain insight into attitudes and barriers to sound dietary practices. Children in the experimental group were more likely to improve their nutrition knowledge than children in the control group. Socio-economic and cultural problems are presented as barriers to sound dietary practices.

1. INTRODUCTION

Children living and attending farm schools in South Africa are recognized as a vulnerable group at risk of inherited and acquired negative development and health problems (UNICEF, 1993). They are nutritionally disadvantaged before birth due to poor nutritional status of the mothers, and they are born and live nutritionally disadvantaged (Dept. of Labour, 2001). Among their undesirable experiences are preventable nutritional deficiencies, food insecurity, lack of nutrition information, and the relegation to become a farm worker. They are inclined to join the poor working and living conditions of farm life characterized by coercion and passiveness (UNICEF, 1993; London et al, 1998b; Dept of Labour, 2001).

According to the South African Department of Labour's report, farm children are more likely to be stunted and wasted than any other children. They are prone to drop-out from formal education more than any other children. They seem to skip the period of childhood characterized by innocence into the harsh realities of adulthood. Farm children of 14 years and younger in seven of the nine provinces are reported to work full time between 41-50 hours per week (Dept of Labour, 2001). Available data indicate that education may have a significant impact on the health status of children and later on their adulthood. However, children may acquire information on nutrition and diet-health relationships and develop healthful eating patterns (Blaylock et al, 1999; Long et al, 2002).

One of the key goals of nutrition intervention education programmes is to empower people to promote health and prevent diseases (Bloem et al, 2002). The UNICEF conceptual framework on nutrition demonstrates a complex set of underlying causes of malnutrition, death, and disability. The factors considered are lack of information and education; poor household security; inadequate maternal and childcare; insufficient health services; and an unhealthy environment. These have major impacts on health and well-being during childhood and in later stages in life (UNICEF, 1997).

The aim of this paper is to examine the contribution of a nutrition intervention education programme (appendix I) on the nutrition knowledge of children living on commercial farms and attending farm schools. It further explores barriers to sound dietary practices among the children.

2. METHODS

2.1 Design

The study is part of the FLAGH (Farm Labourer And General Health) programme of the North-West University (Potchefstroom Campus). The main aim of the FLAGH programme is to improve the quality of life of farm dweller communities in the North West Province in South Africa through intervention programmes. After a thorough needs assessment within the communities, the need for a project with the potential of improving nutrition knowledge and contributing to food security was determined.

The project was an intervention study. It took place in two farm schools during school hours in the Potchefstroom District in the North West Province. The schools were visited prior to collection of data to discuss the study protocol. The visits were also used to obtain the informed consent (appendix II) from parents of the children. One school served as an intervention group and the other as a control. Vegetable gardens were promoted and established in both schools. Baseline data were obtained before the implementation of the vegetable gardens at both schools, followed by a nutrition education intervention in the intervention school. After 5 months, end measurements in both schools were obtained. Focus group discussions were done at the intervention school.

2.2 Subjects

In both schools, a convenience sample of scholars in grades 2-6, aged 8-16 years, was included in the study. One hundred and forty-four (144) children voluntarily participated. Eighty-six of these children were from the intervention school and 58 from the control school. Of these, 10 left school and 2 migrated and enrolled in other farm schools. A total of 132 children (72 boys and 60 girls) completed the study protocol. Eighty-one of these were from the intervention school and 51 from the control school.

2.3 Ethical Consideration

The Ethics Committee of the North-West University (Potchefstroom Campus) approved the study (approval number 00M21). Consent procedures were in Tswana, the first language of the subjects and their families. Letters and consent forms were sent to the parents/guardians through the children explaining the purpose of the study and making a request for their consent on behalf of the children. Children with signed consent forms or crosses (allowing their children to participate in the study) were included in the study.

2.4 Questionnaire

A structured questionnaire (appendix III) was developed for the study population. It was translated into Setswana and edited by the Language Department of North-West University (Potchefstroom campus). Then the questionnaire was tested for clarity and comprehensibility among a group of primary school children in a farming community in the North West Province. The questionnaire included information regarding knowledge on gardening, nutrition, hygiene, food-based dietary guidelines, and dietary issues. The researcher and three trained native Setswana speaking assistants interviewed the subjects. Data collection took place during normal school hours at the beginning of April 2003. The education programme was developed and given by one person at the intervention school and provided as part of school activities. The contents were tailored to the current knowledge and beliefs of the children, which were determined by the questionnaire and the focus group discussions. The practical garden work, stories, and playful activities ensured the interest and participation of the children. In August, after five months, knowledge of gardening, hygiene, food-based dietary guidelines, and dietary practices were measured again at both schools.

2.5 Focus groups

The focus group discussions were conducted to provide an understanding of the nature and constraints of household nutrition practices and to gain insight into beliefs and attitudes associated with reported knowledge and practices. The focus group questions (appendix IV) were set up in line with the recommendations laid out by (Krueger, 2000). The questions were piloted among a group of children in a farm school in the North West Province. The discussions with children were done with three groups of ten participants each. The groups were composed of both boys and girls. The participants were recruited from each participating grade. One assistant monitored the tape recorder and noted any unforeseen situation during the discussions.

The focus group questions included information on factors that determine diet, barriers to sound dietary practices, and beliefs and attitudes associated with dietary practices. From the transcribed tape-recorded discussions, themes and patterns of common ideas were noted. The main interest was in clusters of common concepts and ideas among the focus groups relating to perceived constraints in practising sound dietary practices.

2.6 Intervention

Vegetable gardens were established at both schools. The intervention took place during normal school hours at the intervention school. Children in grades 2-6 received nutrition education

every week for about 1 hour and 15 minutes, except during school holidays. There were a total of 3 groups: grades 2 and 3 formed one group, 4 and 5 the other, and grade 6 formed the last group. The intervention comprised of games, play, theory, and hands-on activities like planting, watering, weeding, thinning, and cultivating the vegetable garden.

2.7. Statistical Analysis

The data should be considered as small populations for which statistical inference and *p*-values are not relevant. Instead of only reporting descriptive statistics in these cases, effect sizes (a measure of practical significance) were determined. Practical significance (d-value) can be understood as a large enough difference to have an effect in practice and is described for differences in means. Effect sizes not only makes the difference independent of units and sample size, but relates it also with the spread of the data. An effect size, $d \approx 0.8$, is considered a large effect; a medium effect is defined as $d \approx 0.5$, and $d \approx 0.2$ indicates that the effect is not practically significant. For 2 independent groups,

$$d = \frac{|\bar{x}_1 - \bar{x}_2|}{s_{max}}$$

where d = practical significance / effect size

$\bar{x}_1$ = mean of a group

$\bar{x}_2$ = mean of the second group

s_{max} = maximum standard deviation.

For dependent data,

$$d = \frac{\bar{x}_{diff}}{s_{diff}}$$

where d = practical significance / effect size

$\bar{x}_{diff}$ = mean difference

s_{diff} = standard deviation difference (Steyn 2000)

The Statistical Analysis System (SAS) Version 8 was used to perform analysis of the data.

It included:

- descriptive statistics for demographic variables in both the intervention and control groups;
- calculation of effect sizes to determine practical significance in nutrition knowledge test data **between the groups at baseline**;
- analysis of practical significance **within the groups for baseline/end** nutrition knowledge test data in both groups (effect sizes for paired differences); and
- analysis of practical significance in increase of knowledge **between the groups after intervention** (effect sizes).

3.0 RESULTS

3.1 Demographics

Two primary schools in a farming community participated in this study. The subjects were aged 8-16 in grades 2-6. The children came from commercial farms surrounding their schools. The main products being produced on the farms were dairy, poultry, game, maize, beans, and wheat. From Table 1, men headed 68% of the households in the intervention group. Of these, 61% were fathers, 3% were uncles, 4 % were brothers, and 1% were grandfathers. The head was female in 32% of the households, of which 27% were mothers and 5% were grandmothers. The control group had 59% of households headed by males of which 57% were fathers and 2% were brothers. The female household head percentage was 41 of which 30% were mothers and 11% were grandmothers. Eighty-two percent of the children in the intervention group and 84% in the control group came from labouring families (farm worker, labourer in another industry and domestic service). The main languages spoken at home in both groups were Setswana, Afrikaans, Xhosa, and Sotho. Both groups appear the same in socio-economic and family circumstances.

3.2 Baseline Results

Table 2 shows no practical significant difference in nutrition knowledge between the intervention and control groups at baseline. The d-values of the questionnaire interview test items ranged from 0 – 0.3 indicating that both groups appear the same in nutrition knowledge.

3.3 Differences within groups after intervention

Increase in knowledge within the intervention group had a tendency of practical significance. Table

3 shows items where practical significant increase in knowledge was evident. Practical significant increase ($d>0.8$) in knowledge was found in the intervention group on the following statement:

- It is healthy to eat vegetables, such as potatoes, in their skin (true).

A medium effect ($d\approx0.5$) indicating a tendency to be of practical significance is observed in knowledge of healthier ways of consuming food in the following statements/questions:

- What is the best form to consume carrots and tomatoes? (raw).
- Morogo (green leafy vegetable) is an energy-giving food (false).
- Tea is a body-building food (false).
- When someone is hungry between meals it is healthier to eat sweets than to eat an orange (false).

There was no indication of practical significance increase in knowledge of the control group on these or other items.

3.4 Differences between groups after intervention

Table 3 shows the instrument test items for which the intervention group scored practically significantly higher in knowledge increase than the control group. There is a practical significance between the groups in knowledge of the following test items:

- It is healthier to eat vegetables, such as potatoes, in their skin (true).
- Tea is a body-building food (false).

The intervention group also exhibited a medium effect that might indicate practical significance for higher increase in knowledge in the following item:

- Morogo is an energy-giving food (false).

From Table 3, an increase in knowledge of the questionnaire items; a) what is the best way to eat carrots and or tomatoes; and b) when someone is hungry between meals it is healthier to eat sweets than an orange, might be of practical significance in the intervention group. However, when compared to the control group, it is not more practically significant than an increase in knowledge in the control group.

3.5 Dietary practices

As indicated in Table 3.4, all children reported eating supper. The table indicates that some children did not eat breakfast and some did not eat lunch. The main breakfast meal was bread and tea or mealie-meal and milk. A few of the children consumed mealie-meal on its own, or mealie-meal and meat, or mealie-meal and tea for breakfast. For lunch, most of the children ate mealie-meal and meat or mealie-meal and milk or mealie-meal and vegetables. For supper, most children consumed mealie-meal and meat or mealie-meal and milk. The dietary practices remained unchanged after intervention in both groups.

3.6 Barriers to sound dietary practices

The children in the focus groups cited the following factors as determinants of their diets: the main farm produce, payday, and town visits by their parents. Complex social issues, such as the use of meagre wages on alcoholic drinks, were cited as the primary barrier to sound dietary practices. The groups identified financial and consumption related decision making, domestic disputes, the use of alcohol, their guardian's entertainment, lack of care, cost, internalized beliefs, and the physical appearance of some vegetables in the field (they are prickly so they can't pick them) as barriers to their sound dietary practices.

Despite the high scores of hygiene knowledge in the quantitative measure, the children indicated that, to some extent, this knowledge does not imply practice. There was concern from two focus groups about the standard of personal hygiene, hygiene practices during meal times at school and in the school toilets. The groups stressed that some of the children came to school dirty with *threads of blankets* in their hair and in soiled clothes. They reported that some children do not wash their hands after visiting the toilet and before eating or serving food. In the school toilets, it was reported that *they* (children) *poke their bottoms and* use the defaecation to *write on the walls. They write about sex.* During discussions on hygiene the children also pointed out that,... *houses are more important than covering food.* They maintained that some children do not have houses. They indicated that their households have knowledge on hygiene issues, but such stressors as lack of shelter are more important than hygiene and, as a result, what is known may not be practiced.

Men were reported to prevent women from buying vegetables not only by mere disagreements on food items to purchase, but by physically doing so in the farm shops. When women attempt to purchase food, let alone vegetables, they are *pulled* and *shaken violently.* The women end up being physically abused. Phrases such as, *Your bleksem, what am I going to drink?* was relayed as the response of the male partner when women attempt to purchase food, let alone vegetables.

In situations where women work, when they (women) are paid, *they* (men) *take the money and use it to buy alcohol.* The scenario was seen as worse when the women drink as well. The use of alcohol was seen as one of the major barriers to sound dietary practices. The groups reported the abuse of alcoholic drinks, which leaves no money to supplement food items bought on credit or provided from the farms. The children maintained that, *alcohol is number 1. They* (parents) *don't think. They don't buy children food, school shoes or pay school fees. All they do is drink, drink, and drink...*

The parents also are reported to play *cartoons* (slug) in the shop and waste a *lot* of money in the process. This form of entertainment was seen as a wasteful way of spending money that could be used for food.

Lack of care and responsibility were also seen as a barrier to good dietary practices. Focus groups stated that, *Our parents do not care whether we have eaten or not. They leave children alone in the houses*, and *fall on us at night from the drinking sessions.* The emphasis was, if parents cared and allocated the available resources, especially capital and time, on family needs, as a whole their dietary practices could be better. It was also pointed out that some of the children in school are the so-called *street children* and, *they are given bread in the farm shops when it has gone mouldy.*

Cost was also seen as one of the barriers to good dietary practices. They reported that farm shops are expensive and their families lack the finance to buy the basics. This was associated, related to and exacerbated by mismanagement of resources and poverty. One group viewed the concept of balancing meals as a waste. It was seen as costly to have two relishes in the form of meat and morogo (green leafy vegetables) in one meal as it was pointed out that there is need to stretch the relish for later use. One remarked, *if I eat my mealie-meal with morogo and meat, what will I have with my mealie-meal tomorrow?*

Internalized beliefs and personal preferences also play a part; some children said they do not eat certain food items like vegetables because they believe the vegetables are not good for their health. Phrases such as, *I don't eat cabbage. It gives me a headache and makes me vomit,* were uttered during discussions

4.0 DISCUSSION

The nutrition intervention education programme resulted in improvement of the nutrition knowledge of children living on commercial farms and attending a farm school. Participants in the intervention school demonstrated significantly better outcomes in nutrition knowledge compared to the control

school. The results had a tendency to suggest that, in practice, the children who participated in the programme were more likely to improve their nutrition knowledge. Based on the results of this study, children participating in the nutrition intervention programme gained more nutrition knowledge than those not included in the study.

Dietary practices described in our study indicate a monotonous diet in terms of repetition of the same food items with little variety. The children mostly consume bread, mealie-meal, and a protein in the form of milk/meat daily. The meals mainly lack food items from the fruit and vegetable group. This finding is consistent with results obtained among farm dwellers in the Transition, Health and Urbanization in South Africa (THUSA) study (MacIntyre *et al*, 2002). In contrast, the study (Dixon *et al*, 2000) among 4-10 year old children recruited from paediatrics in suburbs north of Philadelphia in the USA, improved their overall diet quality of less fat after 3 months of intervention. This is expected, taking into consideration differences in the economies and environment between developed and developing countries.

In this study, children did not accept the concept of balancing meals as they thought it would be a waste to eat maize meal with meat and vegetables at the same time. In addition, there was no improvement on knowledge of the necessity of consuming a variety of foods (a concept associated with food-based dietary guidelines). Further still, there was no improvement in knowledge on healthier ways of consuming vegetables raw. However, this is understandable considering their economic status, accessibility and availability of food, and general poverty. They find themselves in an environment where food should be stretched or saved for other meal times. The level of food insecurity among them may hinder the practice of enjoying a variety of foods. Their meals have low dietary variety with regard to individual foods consumed and when food is also grouped into food groups or on the basis of dietary guidelines. The meals are the same few types of food present in their household and their farm environment. Unlike studies reviewed (Owen *et al*, 1997) on pre-adolescent attitudes, knowledge and beliefs about food, children in this study do not have the option of food choice.

Social, psychological and economic issues were cited as constraints to sound dietary practices. The examples of social and economic problems cited are among problems evident in farming communities in previous research among farm workers in South Africa (Davies 1990; Waldman 1994; London *et al*, 1998a; London *et al*, 1998b; Robins *et al*, 1998; Vorster *et al*, 2000; Dept. of Labour, 2001). What is interesting is that these problems are known to affect the farm worker community, but their impact on children's knowledge of nutrition issues is limited. From our study, these non-nutritional problems appear to threaten the application of nutrition knowledge and

nutritional status of the farm children who are dependent on their environment for survival.

The abuse of alcohol, domestic abuses, negligence of children, and costs are seen by these children as obstacles to sound dietary practices. There appears to be a lack of financial management. Allocation of existing resources is mainly limited and does not promote health. Instead, it exaggerates and exacerbates the already poor situation. The meagre wages are spent mainly on alcohol and children see the male partners' physical control over financial issues as an extension of their poverty. The problems they experience may impede their educational and social success. Children lack the nurturing and care from parents, and it appears they are left to raise themselves. They lack parental attention, compassion and love. This may leave children ill prepared to learn. It may also suggest that parents need to be taught about parenting in addition to the nutrition needs of family members for optimum health. The home environment and poor monotonous dietary intake may negatively affect the pupils' learning.

Our findings provide strong support for the view that while nutrition education is important to children's development of nutrition knowledge and good dietary practices, so are influences from the children's social, economic and psychological environment. In agreement, a study of the association between improved sanitation and children's height in Lesotho (Daniels *et al*, 1991) demonstrated that non-nutritional components might influence nutritional issues. Improved sanitation positively correlated with improved anthropometic status of children under 5. Similarly, our study indicates that the development of nutrition knowledge and sound dietary practices among this population may be hampered by socio-cultural problems of farm life. We argue that, irrespective of the length of nutrition education and its intensity, if these psycho-socio-economic problems are not addressed among this population, application of acquired nutrition education and ultimately the quality of life among this group will become a dream. These problems appear to limit the benefits a nutrition education programme may bring about to these children. What is the use of gaining nutrition knowledge when the environment limits the possibility to apply the acquired knowledge?

Similar to findings elsewhere (Long *et al*, 2002, Dixon *et al*, 2000, Lino *et al*, 1999), the vegetable gardening and nutrition education programme appear to have a positive impact on nutrition knowledge in the experimental group compared to the control group. In a five-year follow-up of a food-based vitamin A intervention in rural Tanzania (Kidala *et al*, 2000), evidence was found that education programmes can improve the nutrition knowledge and dietary practices of vitamin A intake in economically disadvantaged households. The direct access of the sources of pro-vitamin A can be sustained by growing yellow and dark green leafy vegetables (Faber *et al*, 2002). In our

study, after 5 months of gardening and nutrition education, there was an indication of improvement of knowledge in a variety of nutrition-related issues in the intervention school. There was also a marked improvement in knowledge in the intervention school in the health effects of consuming vegetables, like potatoes, in their skin.

In a previous study (Malherbe 1997) on the efficacy of a nutrition education breakfast programme with primary school children in standard 2 in Mitchell's Plain, the children gained and retained knowledge and changed attitudes and behaviour after 2 months of intervention. It was concluded that the study improved knowledge scores by 13%. The children were more aware of what should be eaten as a result of the education programme.

From our study, vegetable gardening and nutrition education alone seem not to be a solution for deficits in nutritional knowledge of children attending farm schools where poverty, alcoholism, food-related domestic disputes, parental negligence, and other adverse life circumstances prevail. If these perceived problems are addressed together with nutrition education, there may be a marked improvement in the quality of life of farm children. These conditions may mask the benefits the education programme may have on this group of children.

On the basis of our results, dissemination of nutrition information and skill-based training of children in the farming community are major challenges to the health, social, and education systems. The nutrition knowledge among children living and attending farm schools and perceived barriers to sound dietary practices demands a multidisciplinary approach, integrated and intersectional, from all departments of different ministries. The primary goal should be towards improving the quality of life of the children living and attending schools in commercial farms to make them better citizens of tomorrow. It is recommended that future nutrition research should, in addition to vegetable gardening and nutrition knowledge, include psychological, social, and economic intervention programmes.

This study highlighted the potential of intervention through education using gardening as a point of reference. Concepts could be related to gardening. Vegetable gardens could be viewed as a food security project model where children study and grow their own vegetables to improve their overall quality of life. The study further revealed the complexity of acquiring and applying desired nutrition practices.

For future research among this group, questions emerged such as: Does education improve the development of nutrition knowledge and good dietary practices among farm workers if socio-cultural problems are lessened? Can the nutrition education of caregivers/guardians improve the

possibility of choice to apply acquired knowledge among children in farm schools? Is there a link between vegetable gardens, nutrition knowledge, and diet quality of children in a farming community? What impact does government poverty alleviation programmes have on the nutrition knowledge and nutritional status of farm children? What role can the education curriculum play in addressing nutrition education that improves the quality of life among farm children? In addition, future research could concentrate on the development of nutrition knowledge and good dietary practices in affluent societies in South Africa.

The results of this study represent an indication on the improvement of nutrition knowledge and barriers to sound dietary intake among a group of children in a farm school in the North West Province. Two schools out of a total of about 52 in the Potchefstroom/Klerksdorp district participated in the study. This limits our ability to generalize our findings to the entire population of farm schools in the area. Thus, our study could be viewed as a pilot project with the potential to be carried out on a larger scale.

The limitations were also in the time allocation in the school timetable, which was usually towards the end of the day when the children's concentration might have been low. One other limitation of this study is that all data were self-reported. Nutrition knowledge could have been reported on the basis of practices associated with diet. In addition, there were no other methods of food intake to verify the reported dietary practices data. However, the results are consistent with other studies where MacIntyre *et al*, (2002), reported deficient dietary practices among the farm population in their study of dietary intakes among South Africans in transition.

Other problems experienced were lack of water in school, which affected the growth rate of the vegetables. This also may have affected the motivation of the teachers in the school. In the end, the teachers may not have encouraged the children to regularly tend the garden. Equipment was also a problem. There were not enough working tools to tend the garden (digging forks, spades, rakes). When the vegetables were established the birds ate them and there was no netting to protect the vegetables. This study has further shown that water, role models, and equipment needs to be taken into consideration in order to reap desired benefits.

5. CONCLUSION

We conclude that practical nutrition intervention programmes are likely to improve the nutrition knowledge and knowledge of good dietary practices among children in a farming community. Participation in the nutrition education programme did make a substantial difference in the knowledge of farm children for whom it was intended. However, the improvement and application

of this knowledge may be hindered by socio-cultural constraints that may undermine the nutritional benefits and sustainability of nutrition programmes among children living and attending schools in a farm. For future nutrition interventions in this group, it is recommended that a broad, multifaceted approach needs to be employed.

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Table 3.1: Characteristics of the subjects.

Variable	Intervention group (n=81)		Control group (n=51)	
	Mean (range)	SD	Mean (range)	SD
Age (years)	12.6(8-16)	2.0	12.0(8-16)	2.2
Size of household (person)	5.6(2-13)	2.1	5.0(2-11)	1.7
Number of bedrooms	2.9(1-7)	1.4	2.2(1-7)	1.2
	Percentages			
Gender				
Boy	59		47	
Girl	41		53	
Gender of household head				
Male	68		59	
Female	32		41	
Occupation of household head				
Farm worker	46		43	
Labourer in another industry	30		33	
Housewife	10		6	
Domestic Service	6		8	
Supervisory position (industry)	5		4	
Unemployed	3		6	
Main Languages spoken at home				
Setswana	42		71	
Sotho	19		15	
Afrikaans	14		8	
Xhosa	11		6	
Zulu	7		-	
English	4		-	
Sepedi	3		-	

Table 3.2: Mean scores of correct nutrition knowledge answers at baseline

	Intervention group (n=86) Mean Score	SD	Control group (N=58) Mean Score	SD	d-value
It is healthy to eat vegetables such as potatoes in their skin	0.10	0.29	0.12	0.33	0.1
Tea is a body building food	0.47	0.50	0.40	0.50	0.2
Morogo is an energy giving food	0.13	0.34	0.14	0.35	0.0
When someone is hungry between meals it is healthier to eat sweets than to eat an orange	0.50	0.50	0.47	0.50	0.1
A healthy meal could be pap, milk and an orange	0.62	0.49	0.72	0.45	0.2
It is healthy to eat fruit and vegetables everyday	0.70	0.46	0.74	0.44	0.1
Exercise promotes health	0.67	0.47	0.74	0.44	0.2
It is necessary to wash your hands before you eat	0.93	0.25	0.80	0.41	0.3
It is healthy for your body to drink lots of water	0.50	0.50	0.47	0.50	0.1
A vegetable garden needs watering	0.90	0.31	0.95	0.22	0.2
Vegetables protects my body against illness better than pap	0.67	0.47	0.72	0.45	0.1
Vegetables cooked in lots of water are healthy	0.70	0.46	0.69	0.47	0.0
It is healthy for you to eat lots of fat or fatty foods	0.80	0.40	0.79	0.41	0.0
It is healthy to eat different kinds of food	0.47	0.50	0.45	0.50	0.1
It is necessary to eat dry beans, peas, lentils and soya regularly	0.24	0.43	0.33	0.47	0.2
What is the best way to eat					
Carrots?	0.56	0.50	0.43	0.50	0.3
Potatoes?	1.00*	0.00	0.97	0.18	0.2
Spinach?	0.01	0.10	0.10	0.00	0.1
Cabbage?	0.05	0.21	0.03	0.18	0.1
Tomatoes?	0.41	0.50	0.29	0.46	0.2

* 1.00 all children knew that the best way to eat potatoes is when they are cooked.

Table 3.3: Increase in knowledge within and between the groups

Questionnaire items	Within intervention group (n=81)			Within control group (n=51)			Between groups
	Mean #	SD #	d-value	Mean #	SD #	d-value	d-value
It is healthy to eat vegetables such as potatoes in their skin	0.64	0.53	1.2**	0.04	0.40	0.0	1.1**
Tea is a body building food	0.42	0.61	0.6*	0.04	0.66	0.1	0.7**
Morogo (green leafy vegetables) is an energy giving food	0.28	0.58	0.5*	0.02	0.37	0.1	0.5*
What is the best way to eat :							
Carrots?	0.20	0.49	0.4*	0.04	0.53	0.1	0.1
Tomatoes?	0.22	0.55	0.4*	0.11	0.52	0.2	0.2
When someone is hungry between meals it is healthier to eat sweets than an orange	0.23	0.64	0.4*	0.18	0.62	0.3	0.08

Mean and standard deviation of the difference (end minus baseline)

** Large effect (practical significant increase in knowledge)

* Medium effect (may indicate practical significance)

Table 3.4: Dietary practices of children.

	Intervention group		Control group	
	(n=86) Baseline(%)	(n=81) End(%)	(n=58) Baseline(%)	(n-51) End(%)
Breakfast (main food items consumed)				
No food taken	21	15	26	22
Bread and tea	36	42	21	24
Mealie-meal and milk	13	11	21	31
Mealie-meal	7	11	-	4
Mealie-meal and meat	6	7	14	12
Mealie-meal and tea	5	2	-	-
Lunch				
No food taken	9	3	9	9
Mealie-meal and meat	27	36	41	33
Mealie-meal and milk	17	26	21	39
Mealie-meal and *vegetables	11	5	10	6
Mealie-meal	-	-	7	2.0
Bread and milk	-	1	-	6
Supper				
No meal taken	-	-	-	-
Mealie-meal and meat	36	42	47	41
Mealie-meal and milk	14	17	31	20
Mealie-meal and *vegetables	12	11	9	12
Mealie-meal and beans	5	10	-	2.0

* The examples of vegetables given were mainly potatoes, cabbage, onions and tomatoes.

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CHAPTER 4

Women on farms: Nutrition knowledge and factors that influence vegetable consumption

Prepared for submission to Southern Development Africa

4

WOMEN ON FARMS: NUTRITION KNOWLEDGE AND FACTORS INFLUENCING VEGETABLE CONSUMPTION: THE FLAGH PROGRAMME

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ABSTRACT

The study was aimed at improving the nutrition knowledge of women in the farming community through a nutrition intervention education programme reinforced with demonstrations, practical food preparation and cooking lessons. It further examined problems associated with dietary practices. The programme mainly aimed at women with children. A convenience sample of women was used. Twenty-four women participated at baseline of which 19 completed the study protocol. A vegetable garden was established in the yard of each participant. A questionnaire eliciting socioeconomic data and information on issues related to nutrition was developed and used at baseline and after the intervention. Frequencies of baseline results and end results were compared. Focus group discussions were done with two groups of six and eight women respectively to get an understanding of perceived factors that influence vegetable consumption. A nutrition education programme reinforced with culinary skills improved the nutrition knowledge among women in a farming community. However, factors associated with living and working conditions of farm life interact to form cultural determinants of diet within these farming communities.

4.1 INTRODUCTION

Farm workers and their families are the most vulnerable regarding their nutritional and psycho-social welfare in the black community of the North West Province (Vorster *et al*, 2000). According to a report of the Department of Labour, 2001, women and children are the most economically and socially disadvantaged. They often face double oppression from the farmer and their male partners. Men and women farm workers, even though doing the same jobs, may not earn the same salary irrespective of their educational attainment.

Lack of access to nutrition education among women is often seen as an underlying cause of malnutrition in children (WHO, 1990). It is argued that empowering women on nutrition and health issues may lead to an improvement in nutrition for women, children, and the family as a whole. The women are more likely to apply acquired knowledge in a family and appreciate the benefits of the practices (Parmenter & Wardle, 1999; Okoli, 2003).

The Potchefstroom Campus of the North-West University FLAGH (Farm Labourer And General Health) programme has specifically targeted farm dwellers to improve their general quality of life. Supported by research (Vorster *et al*, 2000; du Plessis & Pienaar, 2002; Venter & Larney, 2001; van Rooyen *et al*, 2001; Knight & Lyne, 2002) the FLAGH programme is driven by the belief in research in practice. The programme aspires to empower farm workers and their families in order to alleviate the frontiers of poverty and move towards the ideology of self- reliance and self-sufficiency.

This paper focuses on the nutrition knowledge of women on the farms and factors that affect vegetable consumption in the farming community.

4.2 METHODS

4.2.1 Design

The main aim of this study was to improve nutrition knowledge and knowledge of good dietary practices through establishing and promoting vegetable gardens and using gardens as a point of reference in conveying nutrition knowledge and good dietary practices by women. Also, this study aimed to examine perceived problems associated with dietary practices.

4.2.2 Setting and Subjects

Setting

The study was conducted among an African community working and living on commercial farms in the Potchefstroom District, North West Province. Farms with most children from the neighbouring primary farm school where a nutrition education programme was carried out were identified and selected with the help of the headmaster of the primary school. Women from farms whose children lived and attended the farm school and women with children on farms were recruited. With the help of the headmaster the names of the children were grouped according to their farm residency to identify where most of the farm dwellers could be located. An informal discussion was carried out with these children to locate where most women were residing. The farm owner/caretaker was contacted and briefed on the study protocol and permission to enter the premises was obtained. Two farms with a total of more than five dwelling areas participated in the study.

Farm A

This was a poultry farm where workers were paid on or around the last day of the month. Around the 15th of every month, there was an inspection of the living and working environment by the farm caretaker. Upon satisfactory appearance of the household environment, a worker was rewarded with R100 as an incentive for keeping the environment clean and for having executed the monthly duties well. Should the records show the opposite, the R100 was retained. For example, if you are a hawk caretaker and some of the chickens die, you will not be given the money. The farm has a number of areas where workers stay. Only the locations with women in the study will be described. A total of 15 women from this farm participated in the study.

Farm A, Location 1

There were 15 electrified two-bedroom, detached brick houses in this location. The entrance door open in the sitting area. Both bedrooms open to the sitting/cooking area and no doors were attached. There were no doors to the bedrooms. Usually a sheet/fabric was hanging in the entrance. There was running water in the sitting/cooking area. Two families shared a house and each family had a cooking area at a corner in the sitting area closest to their bedroom. There was also a community hall near the houses and shower rooms for both men and women. In front of the houses was a corrugated iron sheet long-drop toilet system (lavatory). Most people worked as egg sorters/cleaners/graders. Most of the gardens had lawn, flowers, and roses, which were supplied by

the farm owner and maintained by the farm workers. There were peach trees in some yards. Eleven women from this location participated in the study.

Farm A, Location 2

There were four houses in this area that matched the same description as in location 1 except that one family occupied each house. Workers in this area mainly manned the hawks where chicks or chickens were kept. The gardens also had lawn and fruit trees. There was also a corrugated iron sheet long-drop toilet system (lavatory). There were neither showers nor a hall in this area. However, the area was within walking distance from Location 1. Four women from this settlement participated in the study.

Farm B

This was a maize and dairy farm. The workers were paid every Friday. There were three locations from where nine women were recruited to participate in the study. Farm workers were given a parcel of about five kilograms containing a variety of fresh vegetables every Friday.

Farm B, Location 1

This location consisted of a block of 20 dilapidated semi detached brick rooms. The floors were not cemented. There was a corrugated full long-drop toilet system which was at the bridge of collapse. Not all the rooms were occupied. As a result some of the rooms were used as toilets. A water stream ran a few meters from the houses. There was no running water except for a standpipe a few meters from the rooms. There was no electricity. Workers in this location used dry maize cobs, dry cow dung and wood to cook. The area around the block was bare. Three women from this location participated in the study.

Farm B, Location 2

There are five detached, five-room (small) electrified brick houses in this area. There was also running water outside the houses and a long-drop toilet system. The area around the houses was bare. Each family occupied a house. Three women in this area participated in the study.

Farm B, Location 3

The location is close to the primary school and the flats. There was one big dilapidated abandoned farmhouse occupied by three families. There was neither running water nor electricity on the premises. There was also a corrugated long-drop toilet system behind the house. Nearby there was a

stretch of running water. The gardens in this area were not kept. There were no trees except for the windbreakers by the running water a few meters away from the house. Close to the house was a storage shed. Three women from this area participated in the study.

Subjects

In total, twenty-four women aged 20-50 years participated in the baseline measurements. One woman (Farm B, Location 3) moved to a farm not included in the study after a quarrel with her partner. One woman (Farm A, Location 2) migrated with the family to another farming area where the husband heard of better pay. One woman (Farm A Location 1) lost her job and was evicted and one woman (Farm A, Location 1) passed away due to unknown causes. Another woman (Farm A, Location 1) from those who participated at baseline was on a visit to a farm outside the farming area during the time of end measurement and could not be located after a week. In summary, nineteen women completed the study protocol.

4.2 3 Ethical Consideration

The study was conducted in accordance with the Ethics Committee of Potchefstroom University (approval number 00M21). Consent to participate in the study was asked and given in Setswana, the first language of the subjects and their families. Eleven women signed consent forms (appendix v) at their work place and 13 signed at their place of residence. Illiterate women made crosses on the consent form. Two witnesses also signed the consent forms.

4.2.4 Questionnaire

A structured questionnaire (appendix vi) was designed, tested, adapted and compiled for the study population in collaboration with the Statistics Consultation Services of the North-West University (Potchefstroom Campus). It was translated into Setswana and edited by the Language Department of North-West University. The questionnaire tested knowledge and provided information on practices regarding gardening, nutrition issues, hygiene, and the food-based dietary guidelines. Field workers were trained to fill in the questionnaire. The same field workers were used for baseline and end measurements. Baseline data were collected from working women by appointments with them as well as their farm caretakers between 9:00 am and 12:00 noon. End measurements were done during weekends. For the unemployed, data was collected between 8am to 4pm for both baseline and end measurements.

4.2.5 Focus groups

The focus groups were conducted among women to provide understanding of the nature of household nutrition practices and gain insight into beliefs and attitudes associated with reported knowledge and practices. Focus group questions (appendix vii) were set up in line with the recommendations provided in Krueger (2000). Two groups of six and eight women participated in the focus group discussions. The women came from the two farms in the study. The focus group questions included methods of hygiene practice, barriers to vegetable consumption, and the reasons for their nutritional practices and perceived general quality of their health life. From the transcribed tape-recorded interviews, themes and patterns of common ideas were noted. The main interest was in clusters of common concepts and ideas among the focus groups relating to determinants of dietary practices. The focus group sessions took place before the intervention.

4.2.6 Intervention

Lessons on gardening took place simultaneously with the construction of gardens. With the help of some volunteers each woman constructed a vegetable garden in her yard. The garden was made out of seven eco-circles. The women had a choice of the vegetables to plant in six of the eco-circles from spinach, rape, beans, beetroots, cabbage, carrots, potatoes, radishes, chinese spinach, onions, garlic, and green peppers. In the seventh eco-circle, a kei apple tree was planted. The eco-circles, made of recycled tyres, and the vegetable plants were constructed/grown and donated by the Potchefstroom Municipality. Gardening lessons covered the fertility of the soil, the size of the vegetable garden, the location, and the needs of a successful vegetable garden. Watering, weeding, mulching, staking, thinning, and cultivation of soil were covered theoretically and practically coupled with hygiene rules and practices.

As the vegetables grew, lessons on hygiene, balancing of meals and food-based dietary guidelines were covered. The vegetable garden served as a point of reference. Demonstrations were done prior to practical cookery in:

- Harvesting of vegetables to maintain growth;
- Washing and handling of vegetables especially green leafy vegetables to conserve water soluble nutrients;
- Preparation and cooking of vegetables to conserve nutrients; and the
- Serving of vegetables to get maximum nutritional benefit from them.

Each theory and practical session lasted for more than 3 hours with each group. Groups were visited for a period of 5 months. For the first 4 months groups were visited at least once in a week. For one month groups were visited at least twice in a week. Women mainly kept their **estate* (pronounced *staat*) as the point of meetings. An estate is like a village within the farm. Those who had electricity used it for cooking and those who collected biomass used it for cooking. There were a total of 4 working groups, two groups from each farm. The activities took place in the women's yards on a home-based rotation method. During cookery sessions each participant brought along the equipment needed for the session. Initially, on one of the farms where most of the women were employed, the lessons were done in a hall but later moved to the participant's houses as the hall was then used for housing some seasonal workers. The cookery lessons were mainly vegetable dishes that included the sparse available food items in their houses. Events on the farms determined the intervention time schedule. For example, on one of the farms where payment was made on a Friday, it was not possible to carry on with the programme activities on either that day or that weekend.

4.2.7 Statistical analysis

The Statistical Analysis System for (SAS) Version 8 was used to process the data. It included the descriptive statistics for demographic variables, frequencies for the study baseline/end measurements of nutrition knowledge.

4.3 RESULTS

4.3.1 Characteristics of participants

As shown in Table 1, women who participated in the study were on average 29 years of age. Two of the subjects could not remember their age or the number of years they lived on farms. There were about 4 members in a household. There were more females than males in a household almost in the ratio of 1.5:1. On average, the women had spent 19 years in the farming environment. Fifty-three percent of the women had their children attending school at the farm school in the area and 47% had either pre-school children, children who dropped out of school, or children of school age who never attended school. The main language of 85% of the women was Setswana. Over half (53%) of the women were unemployed, 31% worked in poultry, maize, and dairy-related jobs, and 16 % reported working as domestic servants. Thirty-seven percent reported having children under the age of 5. On average, the women had completed grade 4. Twenty-one percent of the women had never attended any formal schooling. At some time in their lives, 95% have picked up vegetables from the veld. Almost a quarter owned refrigerators.

4.3.2 Nutrition knowledge at baseline and after intervention

Table 2 shows that 54% of the households ate vegetables once or twice a week. After intervention the percentage rose to 58%. The percentage of those eating vegetables three or more times in a week doubled from baseline to end of intervention. Sixty-seven percent reported cooking vegetables till there was a colour change from bright green to darkish green. The percentage decreased to 47% after intervention. At baseline, if there was a liquid left after cooking green leafy vegetables 76% threw the liquid away, the percentage decreased by 30% after intervention.

At baseline 92% of the women reported that cooked vegetables are healthier than raw vegetables (Table 3). After intervention the percentage decreased to 74%. Thirteen percent knew an example of a balanced meal at baseline and this increased to 83% after intervention. At baseline, ninety-two percent thought vegetables should be soaked in water when washing them. The percentage decreased to 37% after intervention.

4.3.3 Focus group discussions

Participants cited the interplay between income, cost, likes and dislikes, and preference as the primary structural determinant to overall food consumption. They identified mealie-meal and potatoes as their main basic food items purchased. They reported that the money they are left with is not enough to cover the basic food items let alone spend it on vegetables that cannot make one *as full as the mealie-meal,* and *satisfy your emotional needs as much as tea can. After the deductions* (for the farm produce) *we are left with nothing.* After buying mealie-meal, salt, potatoes, sugar and tea there is no money left, *even if I want to feed my family properly, cost prevents me. A bag of potatoes is expensive.*

It was remarked that if you do not have enough money you would end up, *eating mealie-meal and* eggs from the farm. Joining the unions has worsened the financial situation. *Twenty-five rand is deducted every month for the union and there is no improvement to our conditions.* To them, buying vegetables to supplement their diet is beyond their financial and aspired capabilities.

It was also reported that, *men's salaries are for pineapple* (home-brewed beer made with bread, sugar, yeast and pineapple*).* It was stated that men do not usually come home on payday. They visit the drinking *spot* first and when they come home, *we switch off our radios, they are fm's* (radio frequency*) themselves.* When they get home they have already spent the money on *pineapple.* There would not be enough money to even buy the basics. Women maintained that, *a person who drinks does not care about food.*

The women also cited gender as indirectly determining their dietary practices. There was concern over what was seen as discrimination against female labour of reproductive age within their farming environment. It was remarked that the farmers give preference to males and older females. A young lady remarked that, *the farmer doesn't want to employ us, he said we get pregnant many times. If you are not on the payroll what can you use to buy food?* One has to live and endure what the male partner or the farm environment can offer.

Men's likes and dislikes were also cited as a factor that influenced food consumption. It was reported that *men do not like vegetables*, so vegetables are not bought. It was also remarked that women are at times physically abused if they provide morogo as relish. The women also cited their own preferences in buying food items. One remarked that, *I would rather buy tea and sugar than* vegetables. *Vegetables are not more important than tea.*

The use of alcohol, mostly by men and some women, was cited as a problem in the farming community. The practice is perpetuated by selling their ration of milk, eggs or chickens and/or by borrowing money from friends and relatives within the farm. If there are no rations, they illegally help themselves to some of the farm produce and sell it to buy home-brewed alcohol. The home-brewed alcohol is also bought on credit, paid off on payday, and credit later given again. The women mentioned that the practice of beer drinking often results in violence. In addition it does not leave money for food. During the discussion on the maize and dairy farm, one woman remarked, *I don't stay here on Fridays. It's time for drunkenness, violence, and insults—that's the way people enjoy life here.*

5.0 DISCUSSION

Findings indicate that nutrition education, reinforced with production, preparation and cooking sessions, are likely to advance the nutrition knowledge of participants. At the baseline phase of the study, participants had poor knowledge of the preparation of vegetables, the use of different food items in the body, and knowledge of a balanced diet. Reported knowledge and practices demonstrated that women lacked skills that are complementary to nutrition knowledge and healthier practices. The practice of boiling green leafy vegetables till they changed colour from green to darkish-green and throwing away the liquid indicated lack of knowledge that compromised the health and nutritional benefits that can be derived from eating the vegetables raw, boiling vegetables for a short time, and from consuming the liquid together with the vegetables or using the liquid in another dish. This is comparable to Kruger & Gericke's (2002) study on knowledge and attitudes on nutrition of rural feeding and weaning practices of mothers/caregivers of children aged

36 months in the Moretele District (South Africa) where women overcooked and over-diluted children's food. Mealie-meal was washed and thinned with water and boiled for a long time to achieve a very soft texture.

Income, cost, preferences, likes and dislikes, the use of alcohol, and gender are reported to influence and determine dietary practices. Women in this study had fewer financial resources for the purchase of vegetables to supplement their diet. Food was purchased for its ability to sustain hunger and not for its nutritional benefits. Women reported occasionally looking for vegetables in the veld and would rather purchase potatoes that were more filling than green leafy vegetables. This finding concurs with previous findings about low-income consumer attitudes and behaviours regarding fruit and vegetables in the U.K. Fruit and vegetables were affordable to the low-income group in the amounts they habitually bought, and purchasing additional fruit and vegetables was seen as expensive (Disdall, 2002).

The limited financial resources of the families in our study manifested itself through acquiring farm produce illegally under the pretext of ensuring food security. In most cases, the practice was to perpetuate alcohol consumption. They see an opportunity in their food insecurity to get food and sell it and then take advantage by buying alcohol. The temptation to channel the proceeds to alcohol consumption is too strong to resist. A factor that possibly affected the illegal procurement of farm produce was susceptibility to get into debt at the farm shop and the drinking spot as soon as they received their wages. The rewards for work done were not felt. This pressurized them to prioritize clearing the previous month's debt in the farm shop and pineapple shebeen's to be able to get into debt again. They found themselves in a vicious circle and negative spiral. Their environment does not offer a conducive support system in order for them to break away. In retrospect, if you do not have any other prospects in life what do you do?

Food was bought more for its satiety value and its ability to fulfill emotional satisfaction than for health benefits. For example, vegetables were judged more on their ability to fill the stomach than on their nutritional value. Tea and sugar were considered more important than vegetables. Alcohol was considered first by most men and some women. Though this was often blamed on poverty of capital, it may also indicate poverty of mind. There is need for a more holistic programme to achieve desired results among this community.

Women reported spending their income on food, children, and general household running costs. The men's income was reported to be mainly spent on alcohol. This is consistent with conclusions reached by Okoli (2003) on the ignored facts on food security and women in developing countries.

From the report, in low-income households, women's income has shown to be more strongly associated with improvement in children's health and nutritional status than men's income. Men had greater control over a higher proportion of their income for personal use. In this study men's income was mainly used for alcohol. This may be an indication of conditioned social behaviour from the experiences of the past. Can practical education and change of conditioned behaviour improve the decision making of farm dwellers?

Structurally, considerable diversity exits between and within farms. Some farm workers enjoy the availability of amenities like water and electricity, while some live in squalid, abandoned and dilapidated environments. Some spend hours looking for indigenous vegetables, wood, cow dung, and maize cobs in order to prepare meals. Some families shared housing while, in the same farm in a close by distance, some families stayed alone.

The main finding of this study is that practical education has the potential to markedly improve nutrition knowledge. Our results also possibly reflect the social, emotional and economic experiences faced by women on farms in procuring food for the family. They endure abuse and walk long distance to get and barter food. There is need to emancipate women on farms.

Several limitations of our study design must be noted. Because the study did not have a control group upon which results could be compared, inferences regarding marked improvement in nutrition knowledge must be made with caution and should not be held to be conclusive. In addition, reported knowledge at baseline seems to have been made on the basis of food preparation and consumption practices and not on knowledge. However, a hands-on learning environment resulted in satisfaction from the participants and the researcher, which could not be measured by the constructs of this study.

6.0 CONCLUSION

Practical education on vegetable preparation techniques improved the nutrition knowledge and possibly enhanced cookery skills of participants. Cost, dislikes and likes, and gender determined the availability of food. Although the education programme indicated improvement on nutrition knowledge, there were indications of the need to address the practical psycho-socio-economic problems experienced among this community in addition to the problems of infrastructure, isolation, behaviour associated and related to alcohol consumption, and decision making. Findings of this research challenge education and health practitioners to design practical programmes for women on farms that not only reinforce nutrition education with production, preparation, and

cooking lessons, but also address social factors that influence consumption. There is also need to advocate for support systems.

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Table 1-Characteristics of subjects

	(n=19)	
Variable	Mean(range)	SD
Age*(years)	29(20-50)	13.2
Household size	4(3-11)	1.9
Household composition		
Male	2(0-5)	1.3
Female	3(1-6)	1.2
Children under 5 years	1(0-3)	1.1
Length of stay on farms*(years)	19(3-36)	12.2
Length of stay at present farm (years)	11(1-34)	9.2
Educational level (Grade)	5(0-11)	3.4

**(n=17)*

Table 2 Preparation, cookery and consumption of vegetable practices.

	% at baseline (n=19)	% after intervention (n=19)
How often do household members eat vegetables in a week?		
Once a week	21	16
Twice a week	33	42
Three or more times a week	13	26
Everyday	8	16
How long do you normally cook your green leafy vegetables		
Till there is a colour change from bright green to darkish green	67	47
For a short time before they lose their green colour	33	53
After cooking green leafy vegetables, is there any liquid left in the pot?		
Yes	63	47
No	38	53
If yes, what do you do with the liquid?		
Throw away	76	30
Use as gravy	24	70

Table 3-Questinnaire items: percentages answered correctly at baseline and after measurement

	Baseline Measurement (n=19) % answering correctly	End Measurement (n=19) % answering correctly
It is not healthy to eat lots of fat or fatty foods (F/N)	75	68
It is healthier to eat vegetables everyday (F)	17	84
A vegetable garden can improve variety of food available for consumption in a household (F)	100	100
It is not necessary to eat dry beans, peas, lentils and soya regularly (F)	75	11
Exercise promotes health (F)	13	90
Cooked vegetables are healthier than raw vegetables (N)	92	74
Vegetables can be eaten in the place of meat because they can also build the body (N)	83	68
A healthy meal can be pap, milk and an orange (N)	13	84
Vegetables which have been cooked for a long time are healthier than vegetables which have cooked for a short time (N)	67	26
Vegetables cooked in lots of water are healthier (N)	33	21
Morogo (green leafy vegetables) is an energy giving food (N)	88	68
Vegetables are foods that protect you against illness (N)	100	100
I think it is better to peel vegetables such as potatoes and carrots before they are cooked (N)	83	58
Vegetables should be soaked in water when washing them (N)	92	37
A large amount of land the size of a maize field is needed for a vegetable garden (G)	75	32
A vegetable garden needs watering(G)	75	100
A vegetable garden can improve food available for consumption in a household.(G)	100	100
A vegetable garden can improve food variety in a household. (H)	8	100
It is necessary to wash hands before you eat(H)	100	100
It is necessary to wash hands when you work with food(H)	100	100
One should not smoke where food is prepared(H)	8.3	95
It is not necessary to put a cloth or lid on a bucket of clean water (H)	25	15

(F) Statement related to food based dietary guidelines
(N) Statement related to nutrition issues
(G) Statement related to gardening
(H) Statement related to hygiene

CHAPTER 5

Summary, Conclusion and Recommendations

5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

In this final chapter, a summary of the main findings from the two interventions will be given. The results of both interventions are given, discussed, interpreted and compared to literature in the preceding chapters. The general discussion in this chapter will thus focus on the implications of the main findings and recommendations. The study:

1. Promoted and established vegetable gardens among women and children in a farming community;

2. Obtained data on current nutrition knowledge, vegetable gardening, and knowledge of dietary practices among women and children in a farming community;

3. Developed an educational nutrition intervention programme and used the programme to educate women and children living on farms on nutrition-related issues;

4. Evaluated the impact of the intervention on the nutrition knowledge and knowledge of dietary practices among farm dwellers; and

5. Explored barriers and factors to sound dietary practices among farm workers.

Strategically, national policy in South Africa regarding the working and living conditions of farm workers has been revamped since independence in 1994 with the introduction of minimum wages (Department of Labour 2001) and Extension of Security of Tenure Act of 1997 among others. However, there are limited (or no) management structures and monitoring programmes established to support these policies. It will be of interest to measure the impact of these policies on the general status of the farm dweller (have the policies improved or worsened the farm dwellers' situation?).

In the same context, for vegetable gardening to be sustainable and contribute positively to nutrition issues in a farming community, it is crucial as this study has implied, that appropriate structures, staff and policies are in place to motivate people to continue growing, acquiring knowledge and consuming vegetables. A study in a rural area in KwaZulu-Natal that integrated a home gardening project with community-based growth monitoring activities, linked to nutrition education, and focused on dark green leafy and yellow vegetables resulted in significant

improvement in the status of rural children. In addition, a year after the study, 114 of the 126 gardens established in the experimental village were still in operation (Faber *et* a., 2002).

5.2 Summary of findings

From the two interventions:

- Nutrition knowledge and knowledge of good dietary practices is more likely to improve through nutrition education intervention programmes.
- Incorporating a vegetable garden into nutrition education programmes may be an effective way of improving nutrition knowledge and knowledge of sound dietary practices, and may provide farm dwellers with direct access to vegetables. Vegetable gardens have shown the potential to improve food variety and serve as an educational tool.
- Nutrition education may not immediately improve nutrition knowledge of concepts that are habitually practiced. A continuous process of learning and doing is needed.
- Socio-economic and socio-cultural issues among farm dwellers may scale down the benefits nutrition intervention education programmes may have on nutrition issues. Thus, nutrition knowledge may be responsive to improvements in social issues.

5.3 Discussion of main findings

In this study, nutrition education improved the nutrition knowledge and knowledge of healthier dietary practices of women and children on a farming community. However, among this group, barriers and factors associated with nutrition issues are complex and may scale down the benefits and application of learned knowledge.

Best *et al.*, (2000) asserts that the low quality of life among farm workers can probably be ascribed to the fact that their needs, goals and wishes are not realized. This low quality of life affects the totality of the individual in every aspect of their lives as this study has shown. The farm worker environment had a great impact on the nutrition intervention as barriers and factors associated with consumption were defined within the context and culture of farm life. Although some of the problems have been addressed through legislation, the historical imbalances remain substantial (London *et al.*, 1998). Alcohol abuse, (as reported in this intervention) is still a problem among farming communities. In the Western Cape, London (2000) attributed alcohol abuse primarily to the so-called 'dop or tot' system, which has long been abolished.

- As recommended in this dissertation, a holistic approach to nutrition interventions is advocated for.

- Regarding vegetable gardening, physical structures and personnel services are needed to maintain sustainability.

There are policies in place to redress the plight of farm workers. However, these policies have not manifested themselves in substantial change in the lives of farm dweller communities due to limited legislation support structures to promote change.

5.4 Conclusions

The study has highlighted both the benefits and limitations of nutrition education intervention programmes. Nutrition education may advance nutrition knowledge among children and women on farms, however, the culture of farm life and limited psycho-social and economic empowerment may limit the benefits of acquired knowledge. Nutrition education in isolation, is not a solution to nutrition-related deficits among farm dwellers as this intervention has shown. A holistic approach needs to be employed on farms to reap desired benefits. Addressing nutrition problems revealed certain trends of social complexities among farming communities that may need to be addressed together with nutrition education. The interplay of prevailing barriers and factors associated with nutrition that are the norm and yet not normal in the farming community, complicate the life of farm dwellers, especially women and children. These experiences, which are psycho-socio-economic and socio-cultural in nature, threaten the well being of farm workers and their families. Despite adequate laws passed to redress the dire conditions facing farm workers. However, these policies have not injected substantial change in their lives due to limited policy support systems. As indicated in this study, further research on farm dweller communities is imperative. There is need for a unified view of the development process among farming communities that emphasize the important interrelationships among the physical, mental, and social aspects of human development. This may have substantial change on nutrition interventions, which aims to improve the quality of life among these communities.

5.5 Recommendations

- There is need to address basic social, economic and cultural needs of women and children in a farming community for marked improvement in nutrition issues and health. These needs should further be extended to men on farms.

- Vegetable gardens with support systems need to be promoted and established on a larger scale in order to provide food and serve as a model for education in schools among farming communities. Education on parenting among farm dwellers may need to be addressed. There is need to empower farm workers.

- Subsequent subsistence and motivation are needed by farm dwellers for extended periods of time to ensure sustainability of vegetable gardening in the farming community. Their education is minimal, they are isolated, and inexperienced to ensure sustainable gardening practices. There is need for a holistic approach to intervention programmes in the farming communities. The farm worker community also needs social support services in order to divert their interest and social inclinations away from alcohol. There is need for responsible alcohol use.

- Advocacy for nutrition education may require a holistic approach. Nutrition education alone is likely to yield results that are not conclusive.

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APPENDIX I
Vegetable Gardening and Nutrition Education Programme

CONTENTS

Introduction

The educational and nutritional status of farm dwellers motivated the development of a nutrition education programme among this group. Ideas were sought, implemented and results evaluated. The programme, the **'vegetable gardening and nutrition education programme'** comprises three components, namely; gardening, hygiene and nutrition related issues (e.g. food based dietary guidelines, nutrition messages). It was designed and carried out among children and women living and working on a farming community. The programme was informed by the baseline analysis of the questionnaire's and focus group discussions reported in chapter's 3 and 4 of the dissertation. It was designed to influence learning through play and practice. The programme should not be seen as a prescriptive model of nutrition education among this group, but a base to promote discussions, concerns, approaches, parameters and processes of nutrition education programmes. The programme was not a logical and linear process, the participants and the environment than the plan governed it more.

Steps in the development process

1. The culture of farm life and the psycho-socio-economic status in respect to nutrition related issues were determined through previous research and FLAGH reviews.
   -Poverty (e.g. services, education)
   -Low intakes of fruit and vegetables
   -likelihood of stunted and underweight children
2. Ideas were developed
   -promote and establish vegetable gardens
   -impart nutrition related information
3. Implementation/Action
   -stories
   -games
   -hands-on activities
4. Results
   -evaluation

Aim of the programme

The aim was to improve nutrition knowledge and knowledge of good dietary practices among farm workers. It was also to encourage self-reliance.

Key strategies

- to establish vegetable gardens and develop educational tools and messages to impart nutrition information
- to provide nutrition information at the point of vegetable production, harvest, and preparation
- to promote access to and availability of a wide range of vegetables and knowledge of healthier dietary practices.

Vegetable gardens were a focal point for nutrition education information and promoting knowledge of good dietary practices.

The presented notes, educational games, stories, and activities were presented in varying modes and degrees taking into consideration the grade, age and motivation of the participants. The programme was mainly practical-oriented. At the beginning of each lesson or activity, a work plan (page 92) had to be filled indicating the goal, resources and the action plan of the lesson. At the end of the lesson, the evaluation section of the work plan had to be completed. This was the basis upon which the next lesson may start.

The programme focused on increasing nutrition knowledge and knowledge of good dietary practices among farm dwellers through hands on activities.

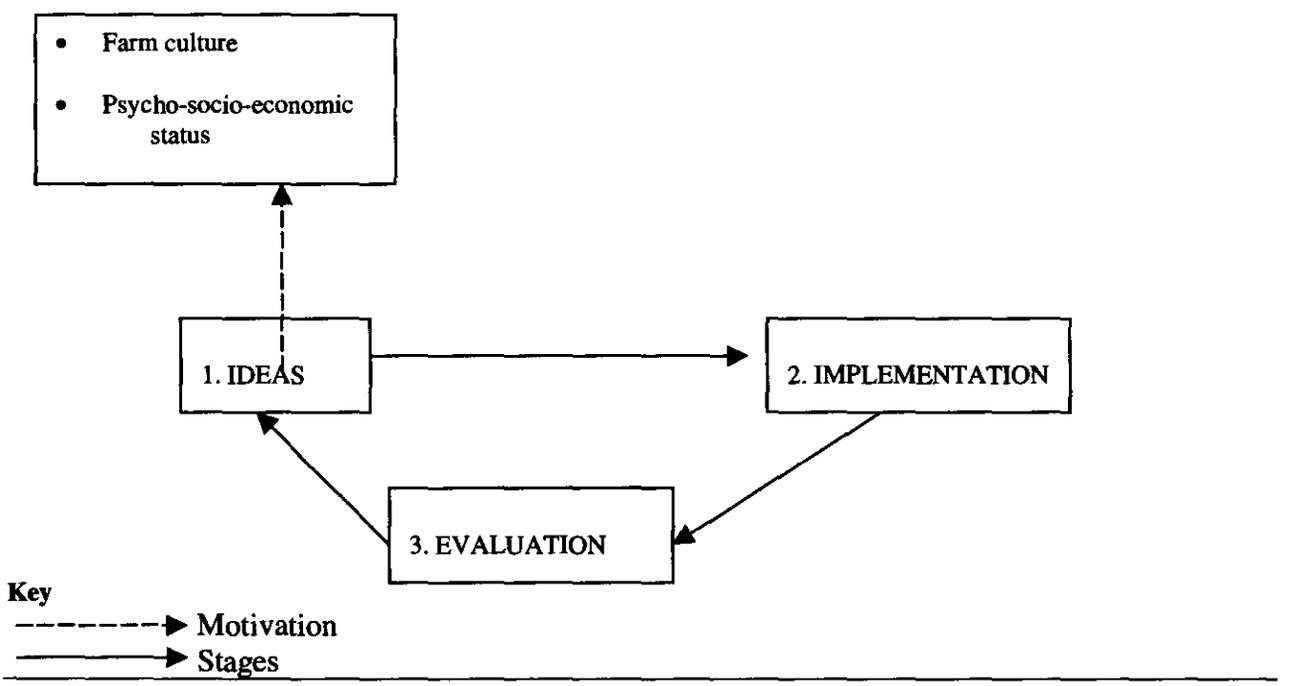


Figure 1: Approach followed in the development of the nutrition intervention education programme

VEGETABLE GARDENING

A vegetable garden needs to be done on a suitable site/place to provide maximum support for the growth of vegetables. At the beginning, it is ideal to keep it small and simple so that it could be easily managed. It should be free of stones and rocks to allow free movement of roots and water. The garden should be flat for irrigation purposes. The soil should be fertile and well drained to support the growth of seedlings. A vegetable garden needs full sunlight (at least 6hrs a day, preferably morning sun). It is ideal to choose a place with no heavy shade.

Vegetable Gardening Needs

- Bed preparation in order to keep the soil loose and suitable for water movement and root growth
- Watering: for fast growth, insufficient watering results in poor growth,, **leafy vegetables** like cabbage and thepe become tough and bitter, **Fruiting crops** like tomato become small (dwarf) flower early and produce fruit, which is tiny and hard
- Weeding: weeds compete seriously and successfully with plants for **food** (soil nutrients), **water** (moisture), **light** and **air**. Weeds also are host plants for diseases
- Weeding can be done by: hand and small cultivation
- Sometimes thinning needs to be done: Good distance between plants is needed for good light and proper movement of air
- Staking, especially for fruiting crops in order to support the plant and help it carry the weight (e.g. tomatoes)
- Pest and disease control needs to be done in order to sustain produce. If pest and disease control is not practiced infection may be spread and spoil the produce.

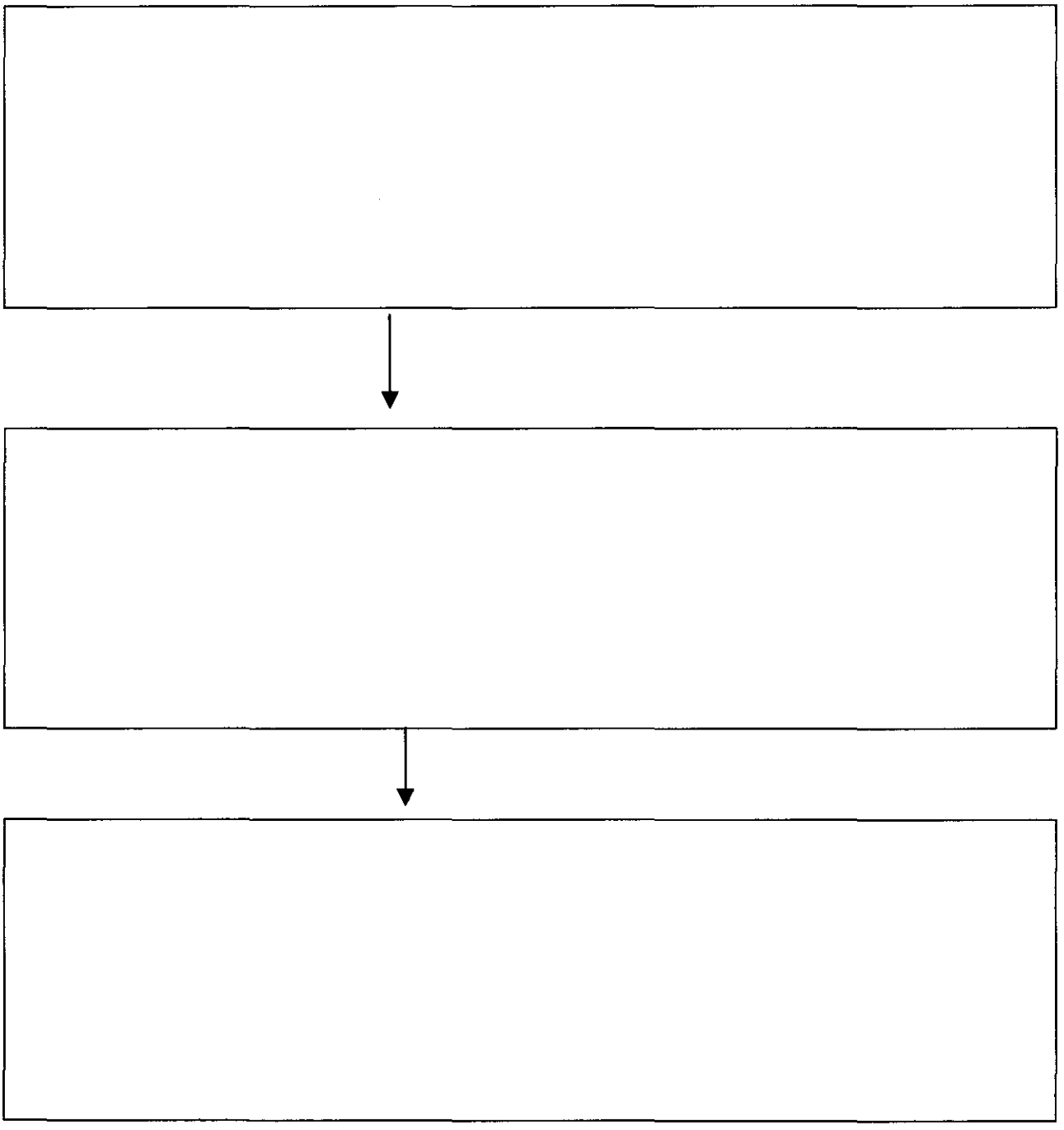
PRACTICALS (Activities)

- Weeding
- Cultivation of soil
- Thinning
- Watering

FOLLOW UP WORK

Children will be asked to look back at the place where the garden is situated and draw the garden from that time and observe from time to time for any changes, which they will include weekly on the drawings.

MY SCHOOL VEGETABLE GARDEN



Write a story about your vegetable garden here. (Do not forget the names of your vegetables)

VEGETABLE GARDENING-COMPOST

The soil should be kept fertile. Manure from chickens, horses, cattle, pigs and donkeys help plants grow.

What is compost?

It is a mixture of plants and animal remains that are broken down into smaller parts (decomposed). It is formed all the time to keep the soil fertile.

- It is done to make sure that plants grow well
- Returns nutrients to soil
- Helps soil hold water

What to use

- Leaves and sticks
- Maize cobs
- Torn-up paper
- Wood ash
- Grass
- Fruit and vegetable waste
- Eggshells and bones

What to avoid

- Do not use plasticised paper (usually used for magazines, posters and frozen food packets)
- Do not use aluminium cool drink cans, aluminium can kill plants.
- Do not use anything that does not decompose(metals and plastic)
- Do not use seeds, diseased animals and diseased plants.

Prepare the ground with children for compost. It is a good idea to start compost a few weeks before gardening.
Ask children to bring some of the materials that can be used.

Provide a sketch of the compost heap below. Label the contents of your heap.

VEGETABLE GARDENING: MULCH

What is Mulch?

Material used to cover the soil between plants. It is a form of 'blanket' for the plants.

What to use

- Leaves
- Grass
- Tree bark
- Manure

Advantages

- Stops evaporation
- Protects soil from wind, rain, and sun
- Weeds do not grow well (sunlight is blocked out)
- Soil does not spatter on leaves when watering
- Reduces erosion

Disadvantages

- Cutworms and other insects may find shelter
- May prevent seeds from germinating if placed too soon.

Follow up work

Apply mulch to the plots.

HYGIENE

Hygiene

Activity: List foods that you usually eat:

- raw and
- cooked
-

Suppose you were given a fruit or carrots from the garden to eat raw or cooked, what is the first thing you would do to the fruit or vegetable before you eat it?

DISCUSS THE BENEFITS OF THE PRACTICES

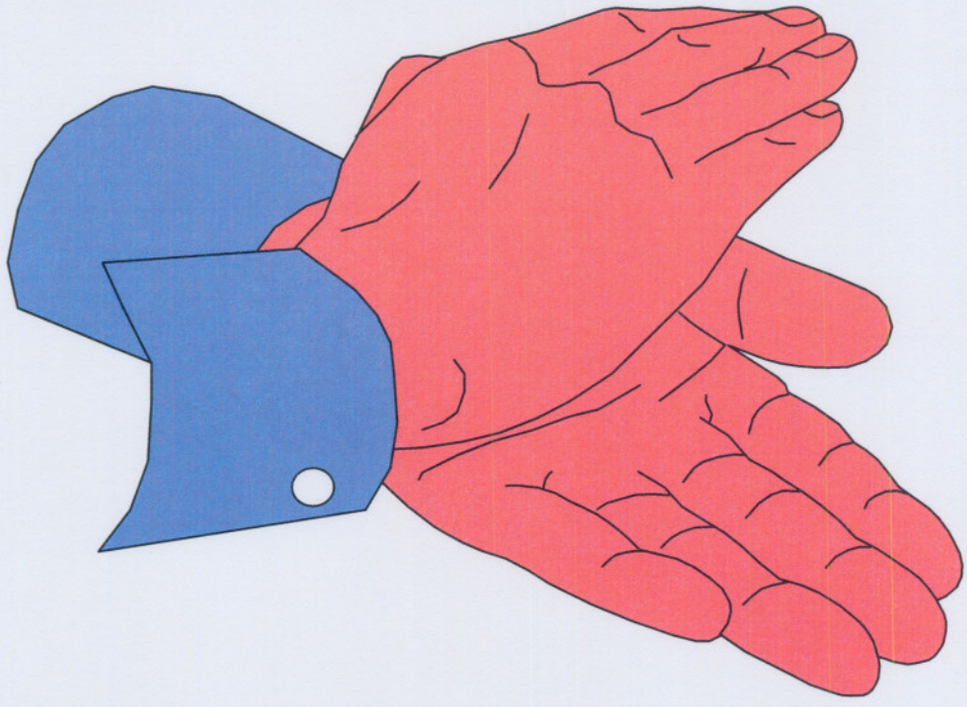
Guidelines for safe food preparation

- Wash hands before touching food and after any contact with bacteria breeding areas
- Cover cuts and wounds
- Do not lick fingers while cooking
- Avoid touching your hair or face
- Do not replace the tasting spoon in food after use.

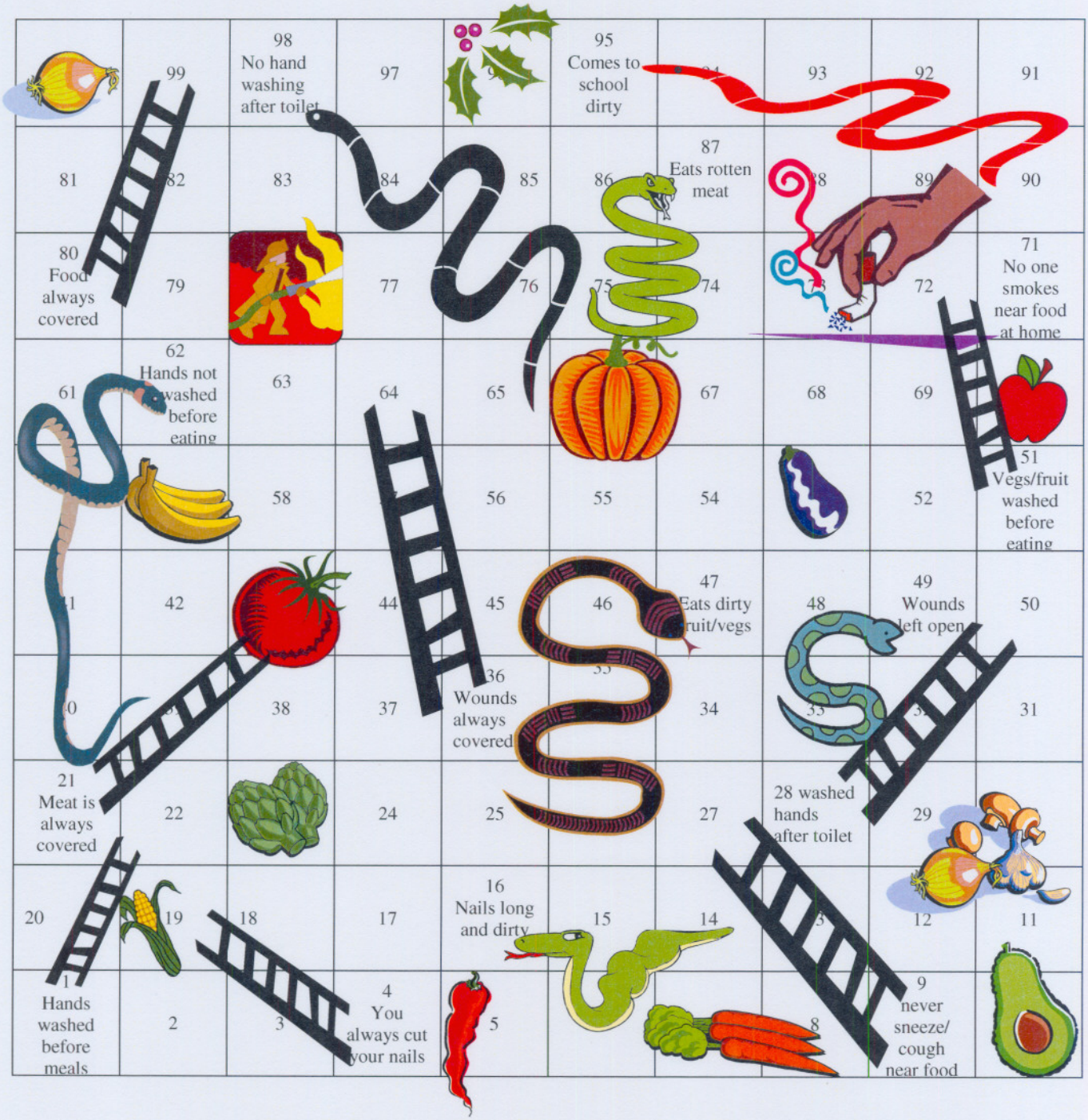
A boy named Mothusi

Mothusi is a 11-year-old boy in grade 4. When he got up this morning he had to go to the toilet. Did he wash his hands afterwards? NO.
Before going to school he played with his dog. Did he wash his hands? NO
He then had his morning tea and bread; he gave a **big sneeze**. Did he wash his hands afterwards? NO.
He left for school, arrived early and played football as a goalkeeper with friends. Did he wash his hands afterwards? NO.
At tea break, the class teacher served bread and drink gave each child a carrot from the garden.
'May I have my share please', said Mothusi.
'Only if you wash your hands' said teacher.
'You always make me wash my hands meneer' why?
Because of bacteria, bacteria are tiny little animals that live everywhere - on dirt, air, on our skin noses, throat, intestines, on clothes, animals and in sneezes. They are very small, so you cannot see them. They can get into your food and your tummy and they can make you very ill.

From that day Mothusi washed his hands from time to time kept them clean and stayed healthy.



For grade 2 and 3's let the students label what they see. For other grades let the students make hygiene rules for Mothusi.



SNAKES, VEGETABLES AND LADDERS

Adapted from the snakes and ladder game

This game was enlarged to a 25 by 25 cm and laminated.

WATCH OUT

Bacteria

Tiny organisms (living things) which we cannot see with our eyes.

Where found?

Surfaces e.g. table tops
Clothes
Air
Animals
Nose
Throat
Intestines
Skin
In small amounts, they are **harmless,** however if they have grown and **multiplied** they may become **dangerous**

What they need for growth

They are like humans. They need **food warmth** and **moisture** to **grow** and **reproduce**

Food: meat, milk, and ice cream

Warmth: They like warm temperatures, cold temperatures slow growth

Boiling kills most, some are tough they need to be heated at high temperatures to be destroyed

Moisture: bacteria live best in moist conditions and moist foods

NUTRITION ISSUES

KNOW YOUR FOODS

Food: any item which when taken by the body will not injure the body.

Name at least 5 food items you know or five food items you like

Foods I know/like
1.
2.
3.
4.
5.

Uses:

It builds the body/ it nourishes the body

It protects the body against diseases

It gives the body energy

Diet - the daily food we eat

Action

Ask some of the children to list all the individual food items they have written.

Together with the children group the food items into their food groups/uses.

Nutrients

Get to the garden

Discuss with children food items from the garden and some pictures. (They can see the food item but they cannot see the nutrients they contain).

Talk about the nutrients, - Proteins, carbohydrates, minerals, water

Talk about tea, beer, chocolates, and sweets

Play the food game.

Give 6 food items to a pair

Have a base, e.g. a picture of a carrot on the base, shout out the name and its food group.

Play the balanced meal game

Using the same food cards, ask groups to make up a balanced meal and explain why it's balanced.

Nutrition Concepts games

- Basic food groups
- Pass the parcel
- Throw the ball
- Balanced diet

Basic food groups

Divide children into main food groups or (food pyramid). One group for each food group. Let each group form a line standing about 15 feet away from pictures of food items in a plastic bag (placed at the center. At the signal, the first one on the line ran to the plastic bag, pick up a food picture appropriate to his or her group and return to the rear of the line, which release the second runner to repeat the process until all the food was gone. Collected items were checked and mistakes corrected.

Pass the parcel

Children sit in a circle, sing, and pass a plastic bag filled with scraps of paper with names of food items written on them. When the whistle is blown, whoever is holding the plastic bag draws out a food a paper, identifies the food item, the basic food group and its importance.

Throw the ball

Let the participants stand in a circle with one person in the center with a ball. At every throw of the ball, the student names a food and the following 2 students name foods that would complete a balanced diet. When the two have given correct items then they will go out of the circle and game continues until all are out.

Dress code (Variety of colours)

Give the groups 10 minutes. Distribute different pictures of food items to a group. Request the group to make a balanced meal. The meal must have 5 food items (which includes 3 vegetables of different colours).

Food based dietary guidelines

Display picture of food and drink items- sweets, alcoholic drinks, vegetables, water, etc. Discuss the advantages and disadvantages. Let the participants draw guidelines. Guide the groups.

The Healthy Diet Pyramid

Discuss the picture of the pyramid and dietary guidelines.

Eat a wide variety of food (name the food items)

Eat less fat (give examples of food to avoid)

Eat less sugar (give examples of food to avoid)

Eat less salt (give examples of food to avoid)

Eat more fibre (give examples)

Exercise regularly (give examples)

Introduction

The main aim of this part of the project was to pass information through practice. The cooking lessons were more geared towards improving handling and cooking of vegetables that complement nutritional status of vegetables rather than good looking meals.

To prepare all vegetable

Remove bad leaves and wash, green leafy vegetables should not be soaked in water, wash under running water, shred, chop or use as a whole or in quarters depending on the recipe.

Coleslaw
½ cabbage, shredded
2 carrots, shredded
1 onion
2 tbs. oil
1 tbs. spoon vinegar
Salt and pepper

Mix the vegetables together in a large bowl. Place all the other ingredients in a jar and shake well to combine. Pour over the vegetables. Use immediately.

Beetroot Salad
Slice or cube boiled beetroot. Add some onion. Serve.

Spinach/Green beans in white sauce
500g spinach or green beans
25ml oil
25ml flour
150ml milk
salt and pepper

Boil the spinach for 5-10 minutes. Retain the liquid. Heat oil in pan, add flour, add the milk and the liquid from the vegetables. Let the mixture slightly thicken. Add your cooked vegetable. Season and serve.

Spinach and carrots.
Boil strips of carrots for 10 minute. Add spinach; boil for 5 minutes, season and serve.

Potatoes in their skin.
Roast potatoes in ash. Serve in their skin.

Soups, salads, stews were prepared using different types of vegetables.

Teaching aids/activities

Use available food items (or pictures and labels) in the households to make balanced meals and identify the food groups and the importance of the food items in the diet

Learning using food pictures and labels

Use the labels to identify vegetables

School children, planting

A plant circle covered with peanut shells for keeping moisture in.

Vegetable gardening (Women at work)

Adapted from Sunday Times Read Right Supplement 3rd August, 2003.

Food preparation

Nutrition messages/Food based dietary guidelines

Translation from top to bottom

Eat plenty of fruit and vegetables every day.

If you drink alcohol, drink it sensibly.

WORK PLAN

GROUP

DATE

PRODUCTION GOAL

RESOURCES

Time needed

Seedlings/Seeds/ Ingredients	Equipment	Main Processes

HYGIENE PRACTICES FOR PRODUCTION

ACTION PLAN

EVALUATION

References

National Department of Agriculture. 1997. Resource material, ARC-Roodeplaat Vegetable and Ornamental Plant Institute. South Africa.

Sunday Times Read Right –a supplement to Sunday Times, August 3 2003.

Agricultural Research Council Infotoons-The rural farmer's step by step guides to small-scale farming, undated.

APPENDIX II

Informed Consent Form (children)

FLAGH – PROJECT : PU FOR CHE

INFORMED CONSENT FORM

Title of the project: Vegetable gardens and Nutrition Knowledge

Name of child:……

Address:……...

Age:……

School:…….. Grade:……..

I, the undersigned, ……, the parent/legal guardian of the child named above, have read the description and explanation of the project "*Vegetable gardens and nutrition knowledge among children in a farming community"* and declare that I understand it. I hereby consent that the child named above may participate in the project, which will entail taking part in vegetable gardening, and answering questions related to the project. I understand that my child will not be harmed in any way, physically or mentally.

……

Signature

Relationship to child named above:……

Date:……..

Dear parent/caretaker,

We are from Potchefstroom University for Christian Higher Education. As part of a community development project, we would like to start a vegetable garden research project at the school of your child, entitled '*Vegetable gardens and Nutrition knowledge among children in a farming community*'.

The project will require that a vegetable garden to be established at the school that your child is attending. The materials for the garden will be provided by the Potchefstroom municipality.

The involvement of your child will be to help in taking care of the garden. We would also like the child to answer questions about his/her knowledge and practice in relation to vegetable gardening and nutrition and attend activities planned for the project. None of the activities will be harmful, either physically or mentally, they instead aim to improve the skills and knowledge of the children involved.

All answers given by your child will be confidential and used for this research project only.
Of course, when the vegetables are harvested, your child will also receive his/her share to be eaten at school lunches.
No money is needed from you or the child.

When you would like to have more information, you can get this from the teachers at the school or from us as one of us will be at the school regularly. You could also contact us by telephone at the university (About the vegetable gardens: 018 299 2466). **You have the right to withdraw your child from the project at any stage, without having to give us any reason.**

We hereby ask you for your permission that the child under your care voluntarily be involved in the activities as outlined above. When you agree, please complete and sign the form attached to this letter and let the child take it back to school. You can keep this letter for your information.

With kind regards,

Dr. A. Kruger, Dr. H. van 't Riet, Mars Phometsi

APPENDIX III

Children's Questionnaire

CONFIDENTIAL

THE DEVELOPMENT OF NUTRITION KNOWLEDGE AND GOOD DIETARY PRACTICES AMONG FARM DWELLERS

(QUESTIONNAIRE)

PP NO: _____

NAME: _____

LOCATION: _____

SCHOOL _____

INTERVIEWER: _____

DATE: _____

CHILDRENS QUESTIONAIRE

The study aims at improving quality of life of communities. By participating in the questionnaire and intervention programme you will gain skill in vegetable gardening and improve your knowledge in nutrition and dietary practices. The result of an established school garden may improve the supply of fresh vegetables in school and at home.

You are requested to answer the following questions as close as possible to **WHAT YOU KNOW AND DO**. There are no right or wrong answers. The questionnaire will take 15-20minutes.

To the interviewer

Please indicate the answers given by placing an X in the box.
In sections which needs writing in, please **PRINT.**

SECTION 1

1.1 Gender

Boy	
Girl	

1.2 How old are you?

1.3. Please state your full date of birth (Date, month and year)

1.4.What grade are you doing?

1.5.How big is your family?

1.6 Who is the head of your family? (Name, relationship and Gender)

1.7 What does the head of your family do for a living?

Farm worker	
Supervisory/semiskilled work at the farm	
Labourer in another Industry	
Domestic service	
Housewife	
Other, please specify _____	

1.8 What language(s) are spoken by most people at home? (Please indicate the first language with 1 and the second language with 2 if applicable)

Tswana	
English	
Afrikaans	
Xhosa	
Other, please specify _____	

1.9 How many rooms does your house have? (Excluding the cooking area)

SECTION 2

2.1 Which vegetables do you like most?

a)	d)
b)	e)
c)	f)

2.2 If there is a vegetable garden at school or home, will you eat more vegetables?

Yes	
No	
Don't know	

2.3 What is the best way to eat the following vegetables?

	Raw	Cooked	Don't know
Carrots			
Potatoes			
Spinach			
Green pepper			
Lettuce			
Cabbage			
Tomatoes			

2.4 The best place for a vegetable garden will be a:

Sunny place	
Shady place	
Sunny and shady place	
Shady and rocky place	

How often do you: (Please repeat this statement with every question)

	Always	Most of the time	Sometimes	Never
2.5 Wash your hands thoroughly before eating?				
2.6 Cut your nails?				
2.7 Coughing or sneezing near food?				
2.8 Cover up any cuts?				
2.9 Wash hands after visiting the lavatory?				
2.10 Wash your fruit/raw vegetable before eating them?				

2.11 Which of the following categories best describes the usual main meal of your day.

Pap	
Pap, vegetable relish, meat	
Pap, meat	
Pap and beans	
Other, Please specify _____	

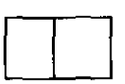
Please listen to the following statements and indicate whether the statement is true or false.

	TRUE	FALSE	DON'T KNOW
2.12 A large amount of land the size of a maize field is needed for a vegetable garden for consumption purposes of a household.			
2.13 It is healthy for you to eat lots of fat or fatty food			
2.14 Meat which has been lying for a long time can go bad and cause one to become sick			
2.15 Cooked vegetables are healthier than raw vegetables			
2.16 A person should eat anything she likes			
2.17 Vegetables can be eaten in the place of meat because it also build the body			
2.18 A healthy meal can be pap, milk and an orange			
2.19 Vegetables cooked in lots of water are healthy			
2.20 Morogo is an energy food			
2.21 Vegetables protect my body against illness better than pap.			
2.22 It is healthy to eat fruit and vegetables every day			
2.23 It is healthy to eat vegetables such as potatoes in their skin			
2.24 Exercise promotes health			
2.25 Vegetables such as morogo, green beans and potatoes are food that build the body			

Please listen to the following statements and indicate whether you agree or disagree

	AGREE	DISAGREE	DON'T KNOW
2.26 It is not necessary to put a cloth or lid over a bucket of clean water			
2.27 It is necessary to wash your hands before you eat			
2.28 It is healthy for your body to drink lots of water			
2.29 A vegetable garden needs watering			
2.30 Weeds growing in the vegetable garden should not be disturbed			
2.31 I like to know more about healthy eating			
2.32 It is necessary to eat dry beans, peas, lentils and soyabeans regularly			
2.33 If I can, I will eat a lot of processed foods high in salt e.g. polony			
2.34 When someone is hungry between meals it is healthier to eat sweets than to eat an orange			
2.35 It is healthy to eat different kinds of foods			
2.36 Tea is a body building drink			
2.37 I like to learn vegetable gardening			
2.38 It is not a good idea to smoke where food is prepared			
2.39 It is not necessary to eat breakfast			

2.40Please state the number of times you eat in a day.



2.41At what times do you eat in a day?

2.42 Please give examples of food you usually eat for the following times of the day.

In the morning. (Breakfast)

Mid-morning

In the afternoon. (Lunch)

Mid afternoon

In the evening. (Supper)

THANK YOU FOR YOUR TIME AND EFFORT IN ANSWERING THE QUES TIONS

APPENDIX IV

Children's Focus Group Discussion Questions

CHILDREN'S KNOWLEDGE-SCALE FOCUS GROUP QUESTIONS

Opening questions

1. Tell us who you are, where you stay and what you most enjoy doing.

Transition question

2. What can you say about the quality of life of the community of klipdrift?

Key questions

3. What is the first thing that comes to your mind when you think about the food you eat at:

a) school
b) home
c)

4. What can you share with us about vegetable gardening in your community?

5. What can you tell us about hygiene and hygiene practices at:

a) school
b) home

6. What may prevent people in Klipdrift from eating Vegetables?(Why?)

7. We are encouraged to enjoy a variety of foods. What do you say about this? What are your practices?(Why)

8. We are encouraged to eat plenty of fruit and vegetables, what are your practices?

9. Why is it that people in klipdrift seem to eat mostly pap and meat and pap and milk?

Ending questions

10. Suppose you had a minute to talk to the Minister of Education on the merit of nutrition knowledge and practices in your school, what would you say?

11. Of all the issues we discussed, which is the most important to you?

Oral summary of the discussion

An oral summary of the discussion will be made.
Participants will be asked about the adequacy of the summary
(Did I correctly describe what was said?)

Overview of the purpose of the intervention

(Is there anything that we should have talked about and we didn't?)

APPENDIX V

Recruitment and Informed Consent Form (Women)

FLAGH PROJECT: PU FOR CHE

RECRUITMENT AND CONSENT FORM

Title of the project: The development of nutrition knowledge and good dietary practices among farm workers

Name: ..... No. .....

Farm name: .....

Location .....

Age .....

INFORMED CONSENT

I, the undersigned.....
(full names in print), have read the details of the project or have listened to the oral presentation thereof, and declare that I understand it. I have had the opportunity to discuss relevant aspects with the researcher and declare that I voluntarily participate in the project. I hereby give consent to participate in the project.

.....

Signature of volunteer

Witnesses

1.....2.....

Signed at ..... on .....

APPENDIX VI

Women's Questionnaire

CONFIDENTIAL

THE DEVELOPMENT OF NUTRITION KNOWLEDGE AND GOOD DIETARY PRACTICES AMONG FARM DWELLERS

(QUESTIONNAIRE)

PP NO: _____

NAME: _____

LOCATION: _____

FARM NAME _____

INTERVIEWER: _____

DATE: _____

WOMENS QUESTIONAIRE

This questionnaire is part of the FLAGH (Farm Labourers And General Health) Intervention research. It aims at improving qualify of life of communities. By participating in the questionnaire and the intervention programme you will gain experience in producing different types of vegetables, and improve your knowledge in nutrition and dietary practices. Established gardens may also supply the family with fresh vegetables and cut on the cost and improve food availability.

There are no right or wrong answers. You are requested to provide as close as possible answers to **WHAT YOU KNOW AND DO**. The questionnaire will take 20-30 minutes.

To the interviewer

Please indicate the answers by filling in the empty spaces. Where applicable, place an X in the empty box to indicate the answer given by the respondent. In sections which needs writing in, please **PRINT**

SECTION 1

1.1.How old are you?

1.2. Please state the full date of your birth (Date, Month, and year)

1.3. What is the size of your household?

1.4. How many are male and how many are female?

Male	
Female	

1.5. How many children residing in the household are under five years old?

1.6. What language(s) do you mainly speak at home? (Please indicate the first language by placing 1 next to it and the second language by placing a 2 next to it if applicable)

Setswana	
English	
Afrikaans	
Xhosa	
Other, please specify _____	

1.7. What education level have you attained?

1.8. How many children do you have at Fikadibeng Primary School?

1.9 What grades are they doing?

grade	
grade	
grade	
grade	
grade	

1.10 How long have you lived on farm(s) _____

1.11 How long have you lived on this farm?_____

1.12 What is your occupation? _____

1.13 Do you own a refrigerator?

YES	
NO	

SECTION 2

2.1. Have you ever been involved in any form of vegetable gardening? (If yes continue with 2.1(a). If no go to question 2.4)

YES		• Continue with 2.1(a)
NO		• Go to question 2.4

2.1(a) How long ago?

Still involved		• Continue with 2.2
Less than 2 years ago		• Go to 2.3
2-5 years ago		• Go to 2.3
More than 5 years ago		• Go to 2.3

2.2 If still involved, is it farmer or household owned? _____

2.3 Are the vegetables for own use or selling?

Own use	
Selling	
Own use and selling	

2.4. Where does your household get its supply of fresh vegetables? (More than one answer possible)

From the shops	
From our garden	
From the veld	
Other, please specify _____	

2.5. Have you ever harvested vegetables from the veld?

YES	
NO	

2.6. Which vegetables do you like most?

a)	d)
b)	e)
c)	f)

2.7 Food in the home is covered or kept in tight fitting containers

Always	
Most of the times	
Sometimes	
Never	

2.8 When I am sick I prepare food for the family

Always	
Most of the times	
Sometimes	
Never	

2.9 After using the lavatory/toilet I wash my hands immediately

Always	
Most of the time	
Sometimes	
Never	

2.10 After handling raw food, rubbish or cleaning material, I wash my hands

Always	
Most of the time	
Sometimes	
Never	

2.11 I use oil when cooking vegetables

Always	
Most of the time	
Sometimes	
Never	

2.12After cutting fresh meat I immediately use the same knife for cutting vegetables if they are available.

NO	
YES	

2.13 When I taste food while cooking I use:

The stirring spoon	
A different spoon never to be placed back into the pot	
My finger	
A different spoon, also several times	
A spoon, to put a bit on my hand and taste from hand	
Other, please specify	

2.14 How often do you use the following fresh vegetables in a week?

	Never	Less than once a week	Once a week	Twice a week	Three or more times a week	Everyday
a) Tomatoes						
b) Lettuce						
c) Pumpkin						
d) Egg plant						
e) Sweet Potato						
f) Green pepper						
g) Cabbage						
h) Carrots						
I) Onion						
J) Spinach						
k). Other, please specify _____						

2.15 How often do household members eat vegetables in a week?

Never	
Less than once a week	
Once a week	
Twice a week	
Three or more times a week	
Everyday	

2.16 Which method do you mostly use for cooking green leafy vegetables?

Fry	
Boil and fry shortly	
Boil and fry for long	
Boil shortly	
Boil for long	
Other, please specify _____	

2.17 How long do you normally cook your green leafy vegetables e.g. spinach

Till there is a colour change from bright green to darkish green	
For a short time, before they lose their green colour	

2.18After cooking your green leafy vegetables is there any liquid left in the pot?

NO	
YES	

If yes what do you do with the liquid? _____

_____

2.19 In our household we eat plenty of fruit

NO	
YES	

2.20 In our household we eat plenty of vegetables

NO	
YES	

2.21 Please indicate the category that best explains the way you eat the following vegetables

	NOT EATEN AT ALL	RAW	COOKED
a) Tomatoes			
b) Lettuce			
c) Pumpkin			
d) Egg plant			
d) Sweet potatoe			
e) Green pepper			
f) Cabbage			
g) Carrots			
h) Onions			
I) Beetroots			
j) Spinach			
k) Other, please specify _____			

Please listen to the following statements carefully and indicate whether it is TRUE or FALSE.

	TRUE	FALSE	DON'T KNOW
2.22 Vegetables such as morogo, green beans and potatoes are food that build the body			
2.23 It is not healthy to eat eat lots of fat or fatty foods			
2.24 Cooked vegetables are healthier than raw vegetables			
2.25 Vegetables can be eaten in the place of meat because it can also build the body			
2.26 A healthy meal can be pap, milk and an orange			
2.27 Vegetables which have cooked for a long time are healthier than vegetables which have cooked for a short time			
2.28 Vegetables cooked in lots of water are healthy			
2.29 Morogo is an energy giving food			
2.30 It is not necessary to put a cloth or lid on a bucket of clean water			
2.31 Vegetables are foods that protect your body against diseases			
2.32 It is healthier to eat vegetables every day			
2.33 Vegetable gardens are beneficial to households			
2.34 A large amount of land the size of a maize field is needed for a vegetable garden for consumption purposes of a household			
2.35 A vegetable garden needs watering			
2.36 Weeds growing in the vegetable garden should not be disturbed			
2.37 A vegetable garden can improve the amount of food available for consumption in a household			
2.38 A vegetable garden can improve the variety of food available for consumption in a household			
2.39 It is necessary to wash hands before you eat			
2.40 It is necessary to wash your hands when you work with food			
2.41 One should not smoke where food is prepared			
2.42 Meat which has been lying for a long time can go bad and make one sick when consumed			

Please listen carefully to the following statements and indicate whther you AGREE or DISAGREE with the statement

	AGREE	DISAGREE	DON'T KNOW
2.43 I think it is better to peel vegetables like potatoes and carrots before they are cooked			
2.44 I like giving my family just pap			
2.45 I like vegetables because they protect my body against illness			
2.46 I would rather buy vegetables than make my own vegetable garden			
2.47 It is better to cook vegetables in lots of water			
2.48 I like vegetables cooked in the skin			
2.49 It is bettter to eat foods like vegetables raw as far as possible			
2.50 I think it is healthy if vegetables are cooked till soft			
2.51 I think that vegetables cooked in just a little water will protect me against illness better than vegetables cooked for a long time			
2.52 I think that cooked vegetables are healthier than raw vegetables			
2.53 Vegetables protect my body against illness better than pap			
2.54 It is necessary to eat vegetables to be healthy			
2.55 I always prepare what the family likes			
2.56 I always prepare whats available			
2.57 I like to know healthy ways of cooking vegetables			
2.58 It is not necessary to eat dry beans,peas,lentils and soybeans regularly			
2.59 Exercise promotes health			
2.60 Vegetables should be soaked in water when washing them			

THANK YOU FOR YOUR TIME AND EFFORT IN ANSWERING THE QUESTIONS.

APPENDIX VII

Women's Focus Group Discussion Questions

WOMENS KNOWLEDGE SCALE FOCUS GROUP DISCUSSION QUESTIONS

Opening question (Each person must answer this question)

1. Tell us who you are, where you stay and what you most enjoy doing.

Introductory question

2. What is the first thing that comes to you mind when you think about feeding your family?

Transition question

3. What can you say about the quality of life of your community?

Key questions

4. What can you say about vegetable gardening?

5. What can you say about hygiene? Personal/chidren/ home.

6. What can you say about vegetable consumption and procurement in klipdrift? (why?)

7. What can you say about cooking of vegetables?

8. What prevent people from eating vegetables in klipdrift?(why?)

Ending questions (Each person must answer this question)

9. Suppose you had a minute to talk to the director of Health on the merit of Nutrition Education in your area, what would you say?

10. Of all the needs we discussed which is the most important to you?

Oral summary of the discussion.

Participants will be asked about the adequacy of the summary.
(Did I correctly describe what was said?)

Overview of the purpose of the intervention
(Is there anything that we should have talked about but didn't)