NUTRITIONAL IMPACT OF A SUPPLEMENTARY FEEDING PROGRAMME ON WOMEN AGED 20-49 YEARS WITH HIV AND AIDS:A CASE STUDY OF COMPREHENSIVE CARE PROGRAMME AT THIKA DISTRICT HOSPITAL IN-KENYA

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A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTERS OF SCIENCE IN APPLIED HUMAN NUTRITION IN THE DEPARTMENT OF FOOD SCIENCE, NUTRITION AND TECHNOLOGY IN UNIVERSITY OF NAIROBI

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Declaration

This dissertation is my original work and to the best of my knowledge has not been presented for a degree in any other university

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We confirm that the work reported in this dissertation was carried out by the candidate under our supervision as university supervisors. It has been submitted with our approval

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Dedication

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This work is dedicated to my son Andrew who came at the time of this degree programme, but cooperated to the very end, my husband Creek Buyonge, son Nashon, daughter Almaz and my cherished mother Pacifica Nyabate for their support. Mama your prayers and encouragement are pillars for my success.



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Abbreviation and acronyms

P

AIDS	Acquired Immune Deficiency Syndrome
AMPATH	Academic Model for Prevention and Treatment of HIV/AIDs
ANP	Applied Human Nutrition
ART	Anti-Retroviral Therapy
BCC	Behaviour Change Communication
RMI	Body Mass Index
CBS	Central Bureau of Statistics
CCC	Comprehensive Care Clinic
FANIA	Food and Nutrition Technical Assistance
FAO	Food and Agriculture organization.
FRP	Food by Prescription
FGD	Focus group discussion
GoK	Government of Kenya
0	Gram5
B HBC	Home based care
HIV	Human Immunodeficiency Virus
IDDS	Individual Diet Diversity Score
KAIS	Kenya AIDS Indicator Survey
KEBS	Kenya Bureau of Standards
KENWA	Kenya Network for women with AIDS
KDHS	Kenya Demographic and Health Survey
KGS	Kilograms
MOH	Ministry of Health
MHAC	Mid Upper Arm Circumference
NACC	National AIDS Control Council
NASCOP	National AIDS and STI Control Programme
NENC	National Food and Nutrition Commission (Zambia)
01	Opportunistic Infection
PEPEAR	President's Emergency Plan for AIDS Relief
PEWHA	People Living With HIV and AIDS
PMTCT	Prevention of Mother to Child Transmission
RDA	Recommended Daily Allowance
RUFT	Ready to Use Therapeutic Food
SEP	Supplementary I ood Programme
SET	Skin Fold Thickness
SPSS	Statistical Package for Social Sciences
SSA	Sub-Saharan Africa
STI	Sexually transmitted infections
TB	1 uberculosis
UNAIDS	Joint United Nations Programme on HIV/AIDS
USAID	United States Agency for International Development
VCT	Voluntary Counselling and Testing
WFP	World Food Programme
WHO	World Health Organization

Operational definitions

Anthropometry	fool used to identify malnutrition and monitor body
	measurements
Asymptomatic	A person infected with a disease but without clinical signs
	and symptoms
Balanced diet	A meal containing all nutrients in right proportions to
	ensure adequate nourishment to the body
CD4 cells	A subset of specialised lymphocytes that are essential in
	fighting (attacking) infections used as a marker for HIV
	progress
Clients	HIV positive women who were used for the study
Comprehensive Care Centre	A site where a person with HIV/AIDS can go for a package
	of care and treatment services. It is usually based in
	hospitals or health centres in Kenya
Dietary Diversity	The number of foods or food groups (in this study)
	consumed in the reference period
Exit strategy	How the programme intends to withdraw its resources
	while protecting the programmes achievements and
	ensuring continued progress towards its goals.
Food by Prescription	A supplementary feeding programme that provides
	therapeutic and supplementary fortified foods for PWHA

Food by Prescription

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Supplement	Fortified blended foods containing corn, soy, sorghum,
	millet, vegetable oil, sugar, salt, protein concentrate and
	micronutrients.
Fond supplement	Food intended to complement the normal diet of a client to
	prevent or treat undernutrition. It was a precooked blend of
	maize, soya, sugar and fat.
Impact	Potential change in health and wellbeing
Malnutrition	A condition in the body brought about by inadequate or
	excess intake of required nutrients, or malabsorption.
Nutrient	A substance or component of food, including
	carbohydrates, proteins, fats, vitamin, mineral and water
Nutrition	Process of food ingestion, digestion and absorption to
	provide the body with the required nutrients
Nutritional status	A measurement of the extent to which an individual's
	physiological needs for nutrients are being met.
Recommended Daily Allowance	The amounts of selected nutrients considered adequate to
	meet the known nutrient needs of healthy people.
Symptomatic	Infection with signs and symptoms

ABSTRACT

Malnutrition contributes to morbidity and mortality in HIV infected persons. In HIV, malnutrition is different from simple starvation and requires targeted interventions, which are meant to halt and reverse its impact on the infected and disease process and progress. One of those interventions is supplementary food programme like the bood by Prescription. The objective and purpose of this study was therefore to determine the nutritional impact of supplementary food intervention programme on HIV positive women. The sample consisted of 66 IIIV positive women between the ages of 20-49 years receiving the Food by Prescription supplementary food at the Thika district hospital comprehensive care clinic. Data were collected using structured questionnaires, focus group discussion, key informant interviews and anthropometric measurements, which were weight and height. Proximate analysis was for the food that was used in the study was carried out at the at the Kenya Bureau of Standards laboratory. Data entry, cleaning, management and analysis was done using the statistical package for social sciences software (version 12.0.1) Data were analysed by simple descriptive statistics, correlations and tests of quality of means. Results showed that 39% of the clients complied by consuming the full amount (9000g) of the supplement issued which lead to a relatively higher body mass index monthly increases compared to those who consumed less. Those who consumed 6000g of the supplement accounted for 48%, while 13% consumed 4500g. The respondents who had stayed in the programme for one to three months had a higher body mass index monthly increases compared to those who had stayed for longer than three months. Those who had stayed for more than six months had the least BMI increment per month. The food supplement ration supplied to the HIV positive women when fully consumed improved nutritional status as required. The factors that influence the sharing of the food is household food. insecurity. Other factors are the supplement acceptability, which was evaluated through the organoleptic properties of the supplementary food and using it as a tool to encourage other people who are HIV positive to attend the comprehensive care clinic.

The current three-month period of supplementation is adequate only when other strategies are in place that will improve their income status. This will play a role in improving their nutritional status thus ensures that they continue meeting their nutrient requirements, which they lacked before joining the programme.

CHAPTER ONE

1. INTRODUCTION

1.1 Background

Developing countries are facing many challenges in different sectors. In the public health sector, Bloom et al. 2006 identifies four key challenges namely transformation of epidemiology, the HIV and AIDS epidemics, the emergence of new diseases and a high sanitation imbalance. HIV is an acronyms for the Human Immuno-deficiency Virus which causes a gradual decline in the body's capacity to resist and withstand infections. It's effects on the immune system occur in distinct phases (Piwoz and Preble, 2000) namely the asymptomatic period where there are no visible symptoms, the early symptomatic period when signs of a weakened immune system begin to show, and the late symptomatic period which constitutes what is officially called Acquired Immune Deficiency Syndrome (AIDS)

HIV and AIDS is currently a threat to human population especially in the developing world. The first HIV/AIDS case was identified in Africa in 1982 after that of the United States of America in 1981. In Kenya it was first diagnosed in 1984 (NASCOP, 2005). Since then there has been concerted effort worldwide to understand the HIV/AIDS epidemic and creating awareness. Nonetheless, HIV and AIDS remains the number one cause of deaths in Sub-Saharan Africa (SSA) and among the leading causes of deaths worldwide. It is also a major threat to long-term economic developments (UNAIDS, 2007). The latest estimates from Joint United Nations Programme on HIV/AIDS (UNAIDS) and World Health Organization (WHO) indicates that between 2001 and 2007, the number of people living with HIV and AIDS globally rose from 29

million to 33.2 million due to the continuing new infections, people living longer with HIV and general population growth. The global prevalence rate levelled at 0.8%. Annual deaths however increased from 1.7 million in 2001 to 2.1 million in 2007 (UNAIDS, 2007).

According to UNAIDS, most of the HIV cases reside in low and middle-income countries. SSA has been hardest hit followed by South and South East Asia (UNAIDS, 2007). Although HIV and AIDS affect both men and women, the women are shouldering much of the burden of the infection given the reported numbers and their responsibilities for providing food and care for family members. For example in South Africa, the HIV prevalence rate is reported to be 10.04% in females and 8.36% in males (Smit, 2007). The impact on women is more significant in SSA where they represent 61% of all adults living with HIV and AIDS (UNAIDS, 2007). This is caused by gender inequalities in social and economic status and in access to prevention and care services which increase their vulnerability to HIV/AIDS. Sexual violence may also increase women's risk.

Kenya like many of the SSA countries is seriously hit by HIV and AIDS. According to the 2003 Kenya Demographic Health Survey (CBS, 2003) prevalence was estimated at 7% among the ages of 15-49 years. However according to the latest report from the Kenya National AIDS Control Council (NACC), a total of 1.3 million are HIV-positive with a prevalence of 5.1% between the ages of 15 to 49 years (NACC, 2007). A preliminary report by Kenya AIDS Indicator Survey (NASCOP, 2007), shows that more than 1.4 million Kenyans are living with HIV/AIDS of which 7.8% among the ages of 15-49 years are infected.

The link between nutrition and HIV and AIDS is that HIV-negative people with poor diets have reduced immunity to HIV and are more susceptible to infection. On the other hand, HIV positive people with poor diets develop AIDS more quickly and those with AIDS have increased nutritional requirements. Both malnutrition and HIV and AIDS have a direct effect on the immune system, impairing people's ability to resist and fight infections. However, nutrition interventions to prevent or reverse the weight loss and wasting associated with HIV may help to preserve independence, improve quality of life and prolong survival (Piwoz and Preble, 2000). Infections affect the nutritional status by reducing the dictary intake and nutrient absorption and by increasing the utilization and excretion of proteins and micronutrients as the body mounts its "acute phase response" to invading pathogens. Infections also result in the release of pro-oxidant cytokines and other reactive oxygen species. This leads to increased utilization of "antioxidants" vitamins (vitamin E, C and beta carotene) as well as the impounding of several minerals (iron. zinc, selenium, manganese, copper) that are used to form antioxidant enzymes (Cimoch, 1997). "Oxidative stress" occur when there is an imbalance between the pro-oxidants and antioxidants, causing further damage to the cells, proteins and enzymes (Piwoz and Preble, 2000).

Malnutrition associated with HIV infection has serious and direct implications for the quality of life of HIV/AIDS patients. Weight loss is often the event that begins a "vicious cycle of increased fatigue and decreased physical activity, including the inability to prepare and consume food" (Piwoz and Preble, 2000). This calls for supplementary feeding which is defined as the distribution of food to supplement energy and other nutrients missing from the diet of those who have special nutritional requirements (Patel et al. 2005). The main purpose of supplementary feeding is in short term to alleviate undernutrition through reducing the gap between an

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individual's actual consumption and nutrient requirements. A secondary objective is to facilitate the caring capacity of the household (Allen and Gillespie, 2001). There is growing evidence that adherence to Anti-Retroviral Therapy (ART) is linked to adequate food and nutrition and that people on ART who receive food supplementation recover much faster (Samuels and Simon, 2006; Edstrom and Samuels, 2007).

Food supplementation can be received in various forms and ranges from dry food stuff like maize, beans, wheat and soybeans. It can also be in the form of blends like maize/soy blend or wheat soy/ blend. Other forms are Ready-to-Use Therapeutic Food (RUTF) and food by prescription (FBP). RUFT is a specialized food like product developed specifically for the nutritional rehabilitation of malnourished individuals like the fortified spreads and the WHO F-100 or F-75. RUTF are typically nutrient dense and can be eaten with little preparation. They resist bacterial growth because of their low water content, and can be stored without spoiling for several months and is being used currently in Kenya. Malawi and Uganda for malnourished people living with HIV/AIDS (FANTA, 2007). FBP are fortified blended foods containing corn, soy, sorgum, millet, vegetable oil, sugar, salt, protein concentrate and micronutrient fortified (Muyunda et al, 2007). This study focuses on the impact of a supplementary feeding programme using the Food by Prescription method on women 20-49 years at the Thika district hospital in Kenya.

1.2 Problem statement

Good nutrition is important for all people irrespective of their physiological state. HIV positive individuals are especially in need of improved nutrition through whatever means that are appropriate and feasible. This is because energy requirements for people living with HIV and AIDS (PLWA) are elevated and fail to maintain body weight and physical activity.

IIIV positive women from low socio-economic status are highly likely to have problems meeting their dictary requirements and that of the family. This makes provision of the supplementary food for the mother only necessary. The food supplement ration given at the district hospital is meant only for the IIIV positive woman attending the comprehensive care clinic (CCC). However when there is food deficits at the household, she may share it with other members of the family she perceives are most vulnerable. As a result she may not consume enough to meet her nutritional requirement. This manifests itself as an apparent failure to achieve the intended target in nutritional improvement. Given that feeding programmes eventually come to an end or individuals are phased out of the programme, there is need for mechanisms to ensure that the clients continue to meet their nutritional needs once out of the programme

Supplementary feeding programmes (SFP) exist in a number of CCC in Kenya, but their impacts on the nutritional improvements of HIV positive women have not been well established. The reason why some who are participating in SFP do not improve their nutritional status has not been established. Although ultimately the SFP will either end or an individual is phased out of it, mechanisms to ensure that clients continue to meet their nutritional needs are apparently not well established.

1.3 Justification

FANTA (2007) highlighted various factors that need to be taken into consideration when designing a food assistance programme in an HIV context. In many cases some of these factors are ignored hence the food does not meet its intended objectives. Some of these factors include ration size, duration and design, monitoring ration use and lastly planning the exit strategy.

1 imited studies like Academic Model for Prevention and Treatment of HIV/AIDS (AMPATH) have been carried out in Kenya to find out whether these factors are being taken into consideration from the initiation to phase out of a supplementary feeding programme. Also very few studies have examined compliancy patterns as gauged against instructions that guide consumption of the supplement (FANTA, 2007).

1.4 Aim of the study

The aim of the study was to improve supplementary food intervention programme for people living with HIV and AIDS.

1.5 Objectives of the study

1.5.1 Overall objective

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To determine the impact of supplementary food intervention programme on HIV positive women in terms of their nutritional status and the possible sustainability of their nutritional status once out of the programme.

1.5.2 Specific objectives

The specific objectives were:

- 1 To determine the socio-economic status of the HIV positive women receiving the supplementary food through the Thika CCC in Thika district hospital.
- 2 To determine nutritional status of non-pregnant HIV positive women aged 20-49 years who are benefiting from 1 BP supplementary food.
- To assess the nutritional quality of the supplementary food given to the HIV positive women at the CCC using proximate composition.
- 4. To determine the coping strategies in place by the target HIV positive women upon phase out from the supplementary food programme.
- 5. To determine the relationship between supplementary food consumption and nutritional status
- 6. To assess the relationship between supplementary feeding programme and the supportive care services at the health facility and at the household

1.6 Hypothesis and research questions

1.6.1 Hypothesis

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 The food supplement ration supplied to HIV positive women when fully consumed improves their nutritional status as required.

1.6.2 Research questions

- 1. What are the means of livelihood of the HIV+ women receiving the supplementary food?
- Does the ration improve the nutritional status of the recipients as desired?

- 3 Does the HIV positive woman consume all the supplementary foodrationand if not how much of the total amount is consumed
- 4 What are the differences in nutritional status between those who share their supplement and those who do not share?
- 5 What factors influence the sharing of the supplementary food at the household?
- 6. Is the supplementary food adequate in quality for the individual receiving it?
- 7 Is there adequate preparation of programme participants on exit from the supplementary food Programme?

1.7 Scope and limitations of the study

1.7.1 Scope

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The study covered a population of HIV[®] women in Thika district who were attending the CCC[®] at the Thika district hospital, and were receiving the Food by Prescription supplementary lood.

1.7.2 Limitations and challenges

The study was limited to the amount of resources that were available and amount of information that the HIV positive women were willing to provide. The results of the study can therefore be used in communities similar to the inhabitants of the area which is an industrial town.

CHAPTER TWO

2. LITERATURE REVIEW

2.1 HIV and AIDS

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Human Immunodeficiency Virus (HIV) is a retrovirus that compromises human immunity making the human body susceptible to many kinds of infections. HIV breaks the body's defence against infection and disease by infecting specific white blood cells, leading to a weakened immune system (WHO, 2004). Acquired immune deficiency Syndrome (AIDS) is a disease condition caused by HIV that impairs the body's natural defence system against disease and infection and hence the most advanced stage of HIV (WHO 2004).

HIV may take years to make the infected person ill and therefore called the asymptomatic stage. During this stage, the immune system of the infected person progressively gets weaker and other virus and bacteria may take "opportunity" of the weakened immune system leading to illness. The time it takes for a person to progress from HIV to AIDS depends on the individual s general health and nutritional status. If HIV infected persons ensure that they have good nutrition and take care of their health, the progression from HIV to AIDS-related diseases is delayed, thus improving the quality of life. It is therefore, very important to give nutritional care and support as part of the comprehensive care and treatment of persons infected with HIV (NFNC, 2004).

HIV prevalence and incidence by region in the World and the prevalence in Kenya by province respectively is as indicated (Table 1 and 2)

Table 1: HIV prevalence and incidence by region globally

Region	Total No.(%) With HIV/AIDS, End of 2007	Newly Infected In 2007)	Adult(15- Prevalence Rate,2007
Global totals	33.2 million (100%)	2.5 million	0.8
Sub-Saharan Africa	22.5 million (67.8%)	1.7 million	5.0
South South Fast Asia	4.0 million (12*4)	340,000	03
Eastern Central Europe	1.6 million (4.8%)	150,000	04
Latin America	1 6 million (4 2%)	100,000	0.5
North America	1.3 million (3.9%)	46,000	0.0
East Asia	800,000 (2.4%)	92,000	01
Western Central Europe	760,000 (2.3%)	31.000	03
Middle East North Africa	380,000 (1.1%)	35,000	0.3
Caribbean	230,000 (0.7° a)	17,000	1.0
Oceania	75,000	14,000	11.1

Source UNAIDS, Slides and Graphics, Global Summary of the Epidemics December 200

SSA had the highest number of individuals living with HFV and AIDS and the highest prevalence among age 15-49 years. Prevalence by province in Kenya indicates that Nairobi has the highest prevalence (10.1%) followed by Nyanza with 7.8%. The lowest is North eastern with a prevalence of 1.4%. Central province has a prevalence of 4.4%. In all the provinces, women have the highest prevalence compared to men.

	Prevalence				
Province	Number	Total	Male	Female	
	HIV Positive	*/=	*/=	%	
Mairobi	197,000	10.1	8.0	12.3	
Custral	96,000	4.1	1.7	6.5	
Canal	93,000	5.9	5.0	6.9	
Zentern	72,000	2.8	1.1	11	
North Eastern	9,000	Le	0.9	1.8	
Nyanza	183,000	7.8	6.1	9.6	
Rift Valley	171,000	38	2.6	4,9	
Western	112.000	5.3	4.2	6.4	
Tatal	931,000	5.1	3.5	6.7	

Table 2: Adult HIV prevalence by province in 2006 in Kenya

Source, National HIV Prevalence in Kenya (NACC and NASCOP, 2007)

Thika district is in central province and in 1994 was rated as having the highest HIV prevalence in the country (39%). However the prevalence has declined drastically in the area to 5.1% as per the sentinel surveillance for 2006, though the prevalence is still the highest in the central province in Kenya (NASCOP, 2006).

2.2 Women and HIV

Women's contribution to food production, food preparation and childcare are critical underpinnings for the social and economic development of communities. Their socio-economic and nutritional status is critical for protecting themselves, their children and the entire society from HIV and AIDS and other infectious diseases. HIV and AIDS has huge implications for the performance of the female labour pool. Proper nutrition would improve the quality of life of those infected with the HIV and AIDS by boosting their immunity. It will also decrease women's susceptibility to opportunistic infections such as tuberculosis (Oniang'o and Mukudi, 2002). This calls for supplementation especially when the HIV positive women are unable to meet their

nutritional needs. Women too shoulder much of the burden of HIV infection in the developing world in terms of their numbers and their responsibilities for providing food and care for orphans and other family members who become sick (Piwoz and Bentley, 2004). Estimated number of HIV positive men and women and the ratio of female to males in selected countries in the world is as shown in Table 3. It indicates that women are more infected than their men counterparts

Table 3: Estimated number of HIV positive women and men

Country	No. Women IIIV	No Of men HIV positive	Ratio Female: mate
ladie	1500,000	2,300,000	0.65
Malaw!	440,000	340,000	1.29
South Africa	2700.00	2,000,000	1.35
Tenzellia	820,000	580,000	1 41
Zimbabwe	1,200,000	800,000	1.50
United States	180, 000	710.000	0 25

Data source: UNAIDS 2002

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for every infected man in Kenya, there are about two infected women, and among 15 to 49 years old, the ratio of infected women to men is 3:1, with the peak prevalence (13%) being found among women aged 25 to 29 years (GoK, 2003).

According to a research by FANTA (2007), women are biologically more vulnerable to getting IIIV than men. This is because of the following reasons:

- High rates of asymptomatic untreated sexually transmitted infections (S11s) make young women more susceptible to acquiring HIV.
- Women are more likely to receive blood transfusions than men because of higher rates of anaemia and complications during childbirth.
- Women may resort to transactional sex to provide for their families during acute food shortages.

- During civil unrest and violent conflict women and girls could be sexually exploited by soldiers and/or militants.
- Many cultural practices allow men to have multiple sexual partners and make it difficult for a woman to insist on safe sexual practices including asking a man to use a condom.

There are also several programs directed at preventing mother to child HIV transmission (PMTCT). As a result of these expanding PMTCT programmes, it is often women who are the first to learn about HIV in the family. As a result of this knowledge, women are often the first to be accused of bringing HIV to the family, even when their husbands are also infected, and the consequences are often severe, including beatings, abandonment, and social rejection

It is the women who experience the daily fear and the blame for passing on the virus to the offspring and it's the woman's nutritional and health status, and her own survival, not that of her husband that largely determine whether her child will be uninfected with 111V, grow well and reach appropriate development. It is the woman too who has to ensure that her family feeds well even when she is ill.

2.3 Nutrition and health

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Nutritional status is the result of complex interactions between food consumption and the overall status of health and care practices. Undernutrition may be indicated by foetal growth retardation, low body mass index (BMI), stunting, wasting, underweight, anaemia and micronutrient deficiencies (Allen and Gillespic, 2001). Poor nutritional status is one of the most important health and welfare problems facing Kenya today and afflicts the most vulnerable groups, namely women and children (CBS, 2003). A nutrition intervention may be defined as one that has the

prevention or reduction of undernutrition as at least one of its primary objectives. Such interventions are usually intended to have an impact on the main immediate causes of undernutrition namely inadequate dictary intake, poor caring practices and disease (Allen and Gillespie, 2001).

2.3.1 Conceptual framework of determinants of women's health

The magnitude of female undemutrition and the enormous social-economic responsibilities, poor health and female nutritional status provide a compelling rationale for systematic interventional action. There are reproductive consequences and long term effects of childhood malnutrition and adult physical and intellectual productivity as well as the widespread impact on women's health and nutrition on child survival. Also women's productivity, family welfare and poverty reduction in the community as whole together with securing adequate nutrition of women particularly before and during pregnancy as a socially and economically important goal for developing countries.

Throughout their life cycle, women's health and nutrition are affected by complex socio-cultural, psychological and health service related factors that are highly interrelated (Figure 1). Social, economic and cultural factors include social status, female discrimination and temale fertility patterns (pregnancy intervals, teenage pregnancy, unplanned pregnancies) that influence both exposure to and consequences of disease. Individual behaviour and psychological factors include dietary practices, reproductive patterns, health seeking behaviour and use of health and nutritional services. On the other hand biological factors include age of menarche, menstruation,

pregnancy and increased risk of infection. Access to quality of and quantity (coverage) of health and nutrition is equally important (FAN1A, 2000).



Conceptual framework for women's health and nutritional status Figure 11 (Adapted from Tinker et al 1994) UNIVERSITY OF HAIM

2.3.2 The link between Nutrition and HIV/AIDS

According to the Kenyan National Guidelines on Nutrition and 111V AIDS (NASCOP, 2007), HIV infection increases nutrient requirements and at the same time impairs nutrient intake and absorption. It also increases the risk of malnutrition through altered food intake and or its nutrient absorption and utilization. Consequently, one risks opportunistic infections (OIs) and progression of HIV to AIDS if their nutritional status is not good.

EAST AFRICANA GOLLECTION

Good nutrition helps one to live a healthier life especially those who are HIV positive. According to Nutrition Access project, HIV changes the structure and function of the cells that line the gut. It also interferes with metabolism of nutrients. The nutrients are inappropriately converted into fat in the liver and fats are stored preferentially instead of being converted into energy. Energy needs are met by sugars and when they are gone, the body converts protein into energy. This

protein is taken from lean body mass and the liver continues to make fats in preference to noteins so that lost protein is not replaced (Low, 1999).

Finally, there are changes in metabolic rate that reflect the way energy is used by the body. People with HIV will expend more energy while resting. The body will compensate for this by reducing the energy spent during activity.

2.3.3 Nutrient needs of people with HIV/AIDS

The nutritional needs of PWHA is influenced by several factors including age, physical activity and an individual's clinical state of health. To maintain good nutrition, an adequate intake of energy-giving foods, proteins, vitamins and minerals, fibre and water is vital. The human body expends energy, when resting. Infections, including HIV/AIDS, increase the body's energy needs depending on the severity of the infection. Protein requirements increase with age from earty childhood to adolescence. An optimum protein intake is about 1 gram of protein per kilogram (g/kg) of body weight. Pregnant and lactating women require more protein. Vitamins and minerals are micronutrients, which play a significant role in immune system functions. Some vitamins are water-soluble such as vitamin C and B-groups. Other vitamin such as A. D. E and K are fat-soluble. They are stored for longer periods in the body, but regular optimum intake is still required. Fortified and blended foods are essential in a population where many are at risk of micronutrient deficiency and adding selected vitamins, minerals and trace elements to staple foods increases nutritional quality of food in a cost effective manner (NASCOP, 2007).

The most important micronutrients in HIV are selenium, vitamin B12, vitamin A, vitamin C and vitamin I- (Henrik, 2005). Low scienium levels in AIDS patients have been directly correlated

with decreased disease progression and risk of death. Selenium normally acts as antioxidant therefore low levels of it may increase oxidative stress on the immune system leading to more rapid decline of the immune system. Vitamin B12 is important in the formation of proteins, messengers in the nervous system, red blood cells, proper functioning of a targe number of enzymes and in maintaining a good immune system. Vitamin C is an important antioxidant, which has the ability to regenerate antioxidant form of vitamin E. The need for vitamin C increases with infection or injury and is essential for the maintenance of bones, teeth, blood vessels and connective tissue. Vitamin E is an antioxidant that plays an important role in protecting the cell membrane, bone marrow toxicity, fats, the immune system and vitamin A from oxidative stress (Henrik, 2005).

Infections including HIV/AIDS increase the body's energy needs depending on the severity of the infection PWHA's energy needs increase with the progression of the disease as shown in Table 4 (NASCOP, 2007). An adult HIV-infected (asymptomatic stage) need 10% more energy. Those at symptomatic stages need 20%-30% additional energy depending on severity of symptoms

2.3.4 Food Assistance in HIV context

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As highlighted by FANIA (2007), the rescarch process through which interventions are designed to combat undernutrition is a dynamic and iterative step by step process. There are various factors that need to be taken into consideration. In many cases some of these factors are ignored so that the food ration used in the intervention does not meet its intended objective. The factors include reviewing the vulnerability assessment data to get the root cause of malnutrition.

or hunger and serve as a guide in ration design. For example, if dependency ratios are uniformly higher than normal in programme area, then the ration should be increased. It months of selfprovision are low, the information can be used to calculate the household calorie gap and provide information for determining ration size.

lioman status	Energy requirement (kenl/day)	Asymptomatic Energy requirement (kenl/day)		Symptomatic Enorgy requirements(kcnl/day)		Protein requirements in(g/day)
		10% extra	Energy	20-30 ⁴ 4	Energy	
SERVICE STREET	2500	260	2840	122-149	Gine Past	37
Manut de marie	27110	280	3060	140-240	1300-3620	57
antevity)	1990	200	2190	100-600	2390-2590	41
Terrel a Maderate activity)	2140	220	2440	640-000	1.45-2168	18
Tapas vonce	2200(290 cvtra)	200	(Jeen)	400-600	2600-2880	- 35
Continent woman	2490(500 astra)	200	2690	400-600	2890-3090	61

Table 4: Energy and protein requirement for PWHA



The use of food can have several objectives which include, preventing malnutrition in vulnerable target groups, rehabilitating malnourished individuals and improving participation in services or activities. When the ration's role is to maintain or improve targeted beneficiaries' nutritional status, the ration should include commodities that appeal to the targeted groups and are high in nutritional value.

Another important factor is considering the appropriateness of various commodities in the HIV context Palatability and digestibility is important especially when providing rations for chronically ill people and PWHA with reduced appetite, cating difficulties or gastrointestinal problems such as diarrhoea, nausea and vomiting from infections or side effects. Therefore when rations are designed, should be designed to minimize discomfort or aggravation of these symptoms. The ration size can also be determined through assessing the increasing requirement for PWHA, high dependency ration or larger household size. Monitoring household resiliency and ration's use in the HIV context is essential for guiding decisions in the duration of the ration. Monitoring also help programmes redefine and improve ration distribution, composition and complementary intervention to maximize the ration's effectiveness. Information should often be collected about use of ration by beneficiaries and perceived acceptability and quality, beneficiary satisfaction with the food, intra-household distribution and extent of sharing.

Exit strategy to ensure sustained nutritional status once out of SFP should be put in place. Improvement or maintainance of nutritional status can be achieved through a combination of strengthened home food production, behaviour change communication (BCC), food storage and preparation practices, and income generation (FANTA, 2007).

A study done in Kenya by Academic Model for Prevention and Treatment of HIV/AIDS (AMPATH) in Western Kenya relating to intervention aimed at strengthening the nutrition and the household food security of people living with HIV. For instance, AMPATH highlighted that provision of an important source of food support to the most vulnerable patients on treatment and their households improves the well-being of HIV infected persons and also contributes to a greater dietary diversity and plays an important role, in the emotional wellbeing of clients by lowering stress caused by insufficient access to food. Clients in the supplementation programme self reported recovery of physical strength that allowed them to return to productive life and greater adherence to treatment. Observable improvements in patients' nutritional and health status acted as a catalyst for increased support from family and community. Recommendations from this study were that the criteria to determine a patient to be phased off food support needed to be better clarified among programme staff and patients (Byron et al, 2006). In a related study done in Malawi, it was also found that food supplementation had a positive effect on nutritional status (Bowie et al, 2005). In both these studies the ration given catered for the whole family using food rations like muize and beans hence meet the nutritional requirement of the HIV people.

2.3.5 Nutritional Assessment

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Nutritional status can be measured for individuals as well as populations. Population measures are more important in research. They can be used to describe nutritional status of the group, identify population or population segments at risk of nutritional related health consequences and to evaluate interventions.

The choice of nutritional status assessment method depends on the objective and the level at which one wants information as well as the validity and reliability of the method. The assessment of the nutritional status is commonly summarised as "ABCD" which stands for anthropometric **measurement**, biochemical or laboratory tests, clinical indicators and dictary assessment

2.3.6 Supplementary feeding

Children and other vulnerable groups at risk of malnutrition are identified by low weight-forheight if they are children and body mass index (BMI) for adults. If identified as malnourished, they are put on a supplementary food programme. Results for supplementary feeding programmes for malnourished children have been disappointing, with over 50% of the programmes in sub-Saharan Africa reporting no significant weight gain with take-home supplementary feeding (Beaton and Ghasemi 1982). An analysis of supplementary feeding programmes in Lesotho found no improvement in weight gain, but there was improvement in clinic astendance. In Malawi a RUTF was introduced in conjunction with home-based therapy for severe childhood malnutrition.

Some of the supplementary foods for PWHA in Kenya include PlumpyNut, F100, F75, com/Soya blend and vegetable oil. Others are cereals like maize and pulses like beans, green grams and green vegetables which given to the PWHA like in the AMPATH programme. The different foods are given to different target groups as indicated in the Table 5.

Туре	Content	Comments	Larget group (mainourished)
PlumpyNut	Peanut buttermilk powder-based paste	Energy dense fortified	OVC particularly children: 2 years born of HIV positive mothers, HIV positive pregnant and lactating women, HIV positive patients on ART or eligible with clinical evidence of malnutration. Others are PWHA on care programmes severely malnourished
F100 mid F75	Dried milk puwder, Mgar, cercal flout, vegetable oil, mineral mix and water to make 1000ml	Supplies 100kcal and 2.9g proteins per 100ml and 75 kcal and 0.9g proteins per 100ml respectively	Same as for PlumpyNut
blend	Pre-cooked com flour and soys flour	Fortified-blended flour	HIV positive adults and children
	Vitamin A supplement and vegetable oil	Fortified vegetable oil	Severely malnourished HIV infected adults and children and also for populations in emergency

As highlighted by FANTA (2007), supplementary feeding is used in HIV programme objectives which include prevention, treatment and care and support. In prevention, food is for foodinsecure vulnerable groups to prevent or reduce high-risk behaviours or reliance on negative coping strategies. It is also for replacement feeding or weaning food where mother is 1IIV positive. In treatment, the food is for high risk groups (pregnant lactating women who are 1IIV positive, HIV-exposed, non-breastfed children), for replacement or weaning where mother is HIV positive and to support nutritional management of symptoms of opportunistic infections. It is also for persons who are losing weight and/or do not respond to medication, to improve ART and TB treatment efficacy and also help manage drug side effects. Finally in care and support, the food is for use in home, clinic, hospice and community based care programs as part of nathative care (FANTA and WFP, 2007).

2.3.7 Supplementary feeding for PWHA in Kenya

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In Kenya Food by Prescription (FBP) and AMPATH are the two major supplementary food programmes for PWHA. In the review of Kenya's FBP programme (2008), FBP provides therapeutic and supplemental foods fortified at HIV care and treatment facilities and targets malaourished PWHA adults. Pregnant and lactating women living with HIV and orphans and vulnerable children (OVC). It was initiated in January 2006 and by 2008 there were 58 MOH. mission and private facilities with more than 24,000 clients. FBP is manufactured locally by Insta Products, Ltd. With three products, each tailored to adults, PMIC1 clients, and children Ihese are

1. Advantage B, which is developed for pregnant and nursing mothers.

2. First food 8, which is suitable for older infants of ages six months to 10 years.

3 Foundation 8 Plus + for children above 11 years and adults.

1 BP are fortified blended foods containing corn, soy, sorghum, millet, vegetable oil, sugar salt, protein concentrate and micronutrient fortified (Muyunda et al, 2007).

AMPATH in Western Kenya initiated a project that was to provide supplementary food to patients through the Highly Active Antiretroviral Therapy (IIAART) and the Harvest Initiative (HIII) in response to poor nutritional status and access to food among many of the initial AMPATH patients placed on ARVs (Byron et al. 2006) The programme established production farms in close proximity to lour of AMPATH treatment sites enabling the provision of locally acceptable, nutritionistprescribed food for any of their patients found to be malnourished and food insecure. There was however concern about whether the rations were reaching the intended beneficiaries or whether the households dilute rations through unfair distribution or even non-consumption. On the transition off food supplementation, there were those who were unable to meet their nutritional needs compared to the period they collected food from the programme. In the AMPATH programme, it was recommended that AMPATH and similar programmes strengthen their investment in the process of transitioning clients off food supplementation. Weaning should ideally occur when secure strategies for meeting food needs are in place either through a patient's return to productive activities or their households' generation of lood and or income.

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2.3.8 Thika Supplementary feeding intervention

Thika supplementary feeding intervention aims at providing comprehensive treatment and care services to HIV positive clients. It is funded by United States Agency for International Development (USAID) as part of the Emergency Plan for AIDS Relief (PEPFAR). PEPFAR has mandated INSTA to support primary care of PWHA by addressing nutrition related medical problems using therapeutic nutrition supplements that are tailored to standards of problem-based management. The programme was started in 2006 at the hospital and issues the three Insta products. The supplementary food used in this study was Foundation & Plus +. According to MOH et al (2005) foundation plus is FBP programme which is a problem based intervention that provides a model for caring for the whole person as an individual. Table 6 and 7shows the nutrient composition and micronutrient composition for FBP respectively. The major aims of FBP include strategies to:

- Maximize the effectiveness of medical and Pharmacological treatments
- Prevent the development of specific nutrient deficiencies
- Optimize the nutrition status, immunity and overall well being
- Prevent and manage medication side effects
- Prevent loss of weight and lean body mass and facets of malnutrition
- Minimize health costs.

2.1
Table 6: The nutrient composition for Foundation & Plus +

Sutrition Facts per 100g (dry)		
amount per serving	100g	
Total fat	12	
Saturated	3.32	
Trans fat	0	_
Polyunsaturated fat	6.71	
Monounsaturated fat	1.76	-
Total carbohydrate	61	
Dietary fibre	4	
Sugars	5	
Protein	15	

Source: MOH et al (2005)

Table 7: Micromutrient composition for Foundation # Plus +

Marriant	Unit	Per 100g	Nutrient	Unit	Per 100g
Venere A(RE)	mcg	240	lodine	mcg	77.3
Vanan B1	me	0.37	Copper	Mg	0.27
Venuen H2	mg	0.43	Iron	Mg	3 20
Huncith (B3)	1000	4.80	Zinc	Me	2 93
Vision B5	mg	1 87	Phosphorus	My	186
Vitamia B6	mg	0.53	Magnesium	Mg	106
Vision H12	mcg	0.75	Calcium	Mg	153
Failute	mcg	160	Manganese	Mg	0.61
Vinmin C	mg	32.0	Molybdenum	mcg	13.3
Vannan D	mcg	1.33	Polassium	Mg	1110
Vitamin E	mg	5 07	Selenium	men	18.6
Vannin K	mcg	24	Sodium	Mg	390

Source MOH et al (2005)

2.4 Gaps in knowledge

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A gap in knowledge is the impact of food supplementation on nutritional status of PWHA in Kenya There is very little information reported on the effects of leakage during food supplementation and the exit strategies in place by both family and institutions offering the supplementary food.

CHAPTER THREE

3. RESEARCH METHODOLOGY

31 Study setting

The study was conducted in Thika district hospital in Central province in Kenya The study site was selected purposively as one of the sites that is issuing food by prescription by I SAID due to the following reasons. first it has a well established CCC with a total number of 601 adults receiving the supplementary food. Secondly, the CCC is at close proximity to the Huka town which is a cosmopolitan town due to the many industries in the area and agricultural plantations. Finally because it has the highest HIV prevalence in the province of 5.1% and in 1994 had been ranked as having the highest prevalence in the country (NASCOP, 2006).

The district lies between latitude 3" 35" and 1" 45" south of equator and longitudes 36° 35" and 37" 25" East. It borders Nairobi city to the south, Maragwa district to the North, Gatundu District to the west and Machakos District to the east. The District has 1479.1 Km sq. It is divided into five administrative divisions, 11 locations, 38 sub locations as shown in 8 and two political constituencies, namely Juja and Gatanga (Thika MOH, 2008). Thika district hospital is located in Juja constituency in Thika municipality division a few meters from the District betadguarters office situated in Thika town. It lies 40Km north east of Nairobi.

DIVISION	AREA (KM2)	LOCATIONS	SUB- LOCATION
Manacipality division	220.2	1	1
Kakuzi	481.2	4	11
Ruleu-Clithurat	526.6	1	7
Gelanga	251.1	4	17
Total for the district	1479.1	11	38

Table 8: Thika district area and administrative units by division

Source Ministry of Health (2008). Thika district annual operating plan

e Population of Thika District was estimated to be 701,664 in 2002 with a growth rate of 2.8% r annum. By the year 2008 this population was expected to have increased to 828,531 auming that the same growth rate persisted. (Ministry of Planning and National Development, 05).

1.1 Distribution of health facilities and morbidity in the district

uka district has 75 health facilities of which 35 are government owned health facilities (Tuble 9). If the 35 government health facilities 28 are dispensaries, 6 are health centres and one district spital. There are a total of 4 CCCs in the district situated at Thika district hospital and at Ruiru, goliba and Kirwara health centres. The other 40 health facilities are either run by faith based ganizations or private organizations. The private owned facilities are mainly concentrated in the ban areas of the district.

DIVISION	NO. OF FACILITIES	NO. OF COMPREHENSIVE CARE CENTRES
Remu'Githurai	27	1
Gatanga	18	1
Kakuzi	7	1
Manicipality	2)	
TOTAL	75	1

ble 9: Distribution of health facilities within the district

a bighlighted in Thika district strategic plan 2005, the most prevalent diseases in the district are
alaria, HIV.AIDS and broncho-pneumonia, while the childhood diseases include anaemia,
ansanus, eye infections, pneumonia, malaria and Kwashiorkor. It is also indicated that
IV/AIDS is a major health problem with the prevalence averaging 34% within the district. The
Broup between 20-49 years is the most affected with the majority of the affected being
male (Ministry of Planning and National Development, 2005). This has resulted in high

wree Ministry of Health (2008) Thika district Annual Operating Plan

increase in number of HIV/AIDS orphans in the district as well as loss of family incomes, some of which are directed towards addressing costs of the pandemic at the household level. The main causes of the spread of HIV/AIDS in the district include unsafe sexual behaviour, drug abuse especially drinking of illicit brews, high levels of peer pressure and ignorance of facts and family breakdowns (Ministry of Planning and National Development, 2005).

Thika district hospital offers the following services, in patient, out patient, casuality, Intensive Care Unit (ICU), theatre and maternity. Other services include X-ray, eve/ear,nose and throat clinic (E.N.T), laboratory, pharmacy, counselling, public health, orthopaedic, amenity, dental clinic, psychiatry clinic, physio and occupational therapy, mother and child health clinic/ family health, comprehensive care clinic(CCC). There is also a rehabilitation centre for malnourished patients.

There are 11 wards which include male surgical, female, paediatric, two amenities, maternity, two general wards, one at the casuality, one for E.N.1 and the mortuary. The hospital has a bed repacity of 265 although it sometimes accommodates over 300 patients. The staff comprises of the following, clinical officers, clinical oral health officers, medical officers incharge, dental officers and technologists, nursing officers and enrolled nurses, nutritionists, surgeons, physicians, gynaecologist, E.N.1 surgeons, paeditricians, radiologists, anaestacians and psychiatrist and pharmacists and the pharmacitical technicians. Others are the health administration officers, health records and information officer and technicians, physiotherapists, medical laboratory technicians and technologists, occupational therapists, orthopaedic technicians and technologists. There are also social welfare officers, secretary, drivers, morgue altendants, clerical officers and support staff. The Thika CCC is an open access centre for patients and clients with HIV which was started in 2004. It provides quick and accurate diagnostic services to patients with HIV and related illnesses like tuberculosis (TB). It also provides medical services for treating opportunistic infections (OIs) in PWHA. Other services offered at the centre include administering ARV drugs, nutritional counselling and support, counselling services and ARV drug adherence support to PWHA. It also provides laboratory testing and monitoring for PWHA on ARV drugs. The social worker based at the CCC helps in the co-ordination of Home Based Care (HBC) services as part of the continuum of care for patients with HIV/AIDS attending both inpatient and out patient services and other non-medical care and support for PWHA. In 2006 the HBP supplementary food was introduced under PEPFAR as a problem based intervention programme.

3.2 Research methodology

3.2.1 Study population

All the women 20-49 years old between August and November 2008 attending the CCC at Thika district hospital and who were receiving the FBP supplementary food ration.

3.2.2 Sampling frame

It included HIV' women aged 20-49 years who were registered at the Thika CCC children. This was by use of the register at the nutrition unit at the Thika hospital CCC.

3.2.2.1 Inclusion Criteria

The inclusion criteria entailed only non pregnant HIV' women aged 20-49 years who were altending Thika CCC receiving the FBP supplementary food and who consented to participation in the study. They were selected from age 20-49 years because according to the Thika strategic plan 2005, women between the ages of 20-49 are the most affected with HIV/AIDS in Thika strict (Ministry of Planning and National Development 2005). This necessitated the study to nover this age group.

12.2.2 Exclusion Criteria

The study excluded HIV' women who were less than 20 years and above 49 years receiving the polementary food. They were considered not to have children and had no dependants at home inspectively.

32.3 Ethical and Human Rights considerations

This study was carried out with full consideration of the ethical guidelines as governed by the **CNAIDS** international Guidelines on HIV and Human Rights. The legal and ethical issues relating to HIV are brought about by people's reaction to the epidemic and they include among others fear and stigmatisation, breach of confidentiality and unethical research (KANCO, 2006). To have a legal ground to undertake the study, a research permit was obtained from the Ministry of Education. Science and Technology Further consent was obtained from the District Commissioner's office and Medical Officer In-charge of the Thika District hospital.

Finally informed written consent was obtained from each respondent before they were interviewed Explanation of what was expected of them was explained. Where consent was funced, the client was asked to sign a consent form (Appendix 1) as all the respondents were to write. Confidentiality of the information received was assured to the respondents. Feedback to the study population was through issuing of a report of the findings to the Medical Officer in charge of the Thika district hospital.

3.2.4 Recruitment and training of field assistants

One field assistant with a good command of English and Kiswahili was recruited. The assistant was selected from a group of who were on internship at the hospital, nutrition department. This was based on a list provided by the nutritionist incharge of the hospital. From the list, the one who was familiar with nutrition education and counselling at the CCC was selected based on the information from the nutritionist at the CCC. The field assistant was then trained by the principal investigator for three days using a training curriculum (Appendix 4) developed by the principal investigator. The curriculum included: interviewing techniques, data collection procedures, use of survey instruments and ethical and human rights issues. Hands-on training was done for two days during the pre-testing of research tools

3.3 Study design

The study was cross-sectional and descriptive in nature and was carried out from August to November 2008. The study subjects included HIV⁺ women clients aged between 20-49 years receiving the nutritional supplement at the CCC at Thika district hospital

3.4 Sampling

3.4.1 Sample size determination

This was exhaustive sampling of study participants using the sampling frame which was limited to the HIV^{*} women who were enrolled in and were receiving supplementary food and met the indicated inclusion criteria. All those who met the inclusion criteria were selected. At the time of study, a total 601 adults were receiving the supplement of which 422 were women and included, pregnant and non pregnant, lactating and none lactating. Out of the 422 a total of 66 HIV⁺ women qualified, gave consent and therefore constituted the sample.

3.4.2 Sampling procedure

The clients were selected at the at the point where they collected their supplement and had their weights monitored when they came to the CCC monthly clinic. The key informants were purposively selected from the staff working at the CCC under the nutrition department while the I GD participants were members of a support group that meets at the hospital x CCC premises with some of the members having benefited in the 1-BP programme. Only members who had received the supplement participated in the FGD.

3.5 Data collection tools and equipments

The study tools included a semi structured questionnaire, key informant and focus group discussion guides. The equipments used included anthropometric measurement tools this is. Stadiometer (Model.CM61HU, England) and digital measuring scale (Secca Scale, Model 7621019009, Germary).

3.5.1 Questionnaires

2

A semi-structured questionnaire which had been previously pre-tested was used to collect information from respondents (Appendix 1). Pre-testing was done on clients attending the same CCC receiving FBP supplementary food but were not included as part of the study sample as no participant was to be interviewed twice. A total of 10 respondents were used for pre-testing, and the data obtained from the pre-testing of the questionnaire was used to modify the questionnaire and was not included in the final research data. The questionnaire included sections on socioeconomic status of the women, health and nutrition, use of the food supplement, food frequency and anthropometric assessment.

3.5.2 Key informant question guide

The key informant guide (Appendix 2) was used to collect indepth information from the service providers on supplementary food. The two service providers were the nutritionist based at the CCC and the other a nutrition assistant whose responsibility was issuing the supplementary food. Some of the information obtained from this interview included the following

- When the programme was started
- The objectives of the programme at the time of initiation.
- The contribution of the programme to management of HIV/AIDS.
- How the programme can be improved to serve the needs of the clients better.
- Strategies in place for sustainability.

3.5.3 Focus group discussion guide

This instrument was used to collect information from a group of HIV women that comprised of individuals who were enrolled in the FBP or who had been in the programme at any one time before the study was carried out. Two focused group discussions were held with one group comprising of eight HIV + women while the other had six HIV + women

3.6 Data collection

Using a pre-tested structured questionnaire, key informant and FGD guides, data were collected on: socio-economic status, health and nutrition, food frequency, human rights and HIV. To obtain informed consent, an explanation of the study including its objectives and how the findings were expected to help the country and specifically PWHA was given to the respondents. Where consent was granted, the respondent was asked to sign a consent form (Appendix 1). All the data was collected at the CCC as here were rooms where the interviews were carried out.

3.6.1 Socio-economic characteristics

Under this the following information was collected, marital status, household size, income level, source of livelihood and the total amount spent on food, and how they planned to cope after exit from the programme.

3.6.2 Health and nutrition status

Nutrition status was assed using anthropometry, frequency of illness, type of food supplement received, the total amount of supplement that is consumed and organoleptic characteristics of the supplement.

3.6.2.1 Measuring weight

The participating women were weighed by using digital scale (Secca Scale Model 7621019009 Germary). The scale was placed on a flat hard surface. The subjects were weighed while standing on the scale bare foot and with light clothing. The balance was tarred to zero before each weighing. The weight was then read to the nearest 100gms (0.1kg) and recorded immediately. I wo measurements were taken in immediate succession and the average calculated using a calculator and recorded. No weight adjustments were done as the respondents were in light clothes.

3.6.2.2 Measuring height

The participating women heights were taken by asking them to stand with heels together, arms to the side, legs straight shoulders relaxed and bear foot. The head was then positioned on the Frankfort horizontal plane (Model.CM611IU, England) and the subject was asked to look straight • head. The heels, buttocks and shoulder blades and back of the head was positioned against the vertical board of the stadiometer. The headboard was then lowered upon the highest point of the head with enough pressure to compress the hair. The measurement was then read to the nearest 0.1cm with the reader's eye in level with the headboard to avoid errors due to parallax. Two measurements were taken in immediate succession and the average calculated using a calculator and recorded.

3.6.2.3 Classification of nutritional status

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BMI was calculated by dividing weight in Kilograms by the square of the height in metres. According to the WHO(2000), according to the Kenya health policy, 111V-infected individuals with a BMI of less than 18.5 are to be supported with therapeutic food supplement for the purpose of improving their nutritional status to a BMI above 18.5 (NASCOP, 2007). Increase in BMI from time of registration was used to assess improvement in nutritional status as a result of the intervention.

3.6.2.4 Frequency of illness

The respondents were asked whether they had been ill in the last 30 days prior to the study and for how many days. Recall was enhanced by asking the respondent from the last time they were at the CCC whether they had been ill and for how many days and the type of remedy that as used This was used to check on the effect of illness on BMI increase (Khongsdier, 2002).

3.6.2.5 Supplementary food issued

Information on type of supplementary food, frequency of collection, total amount consumed and whether it lasted until the next visit was collected. The total amount consumed was estimated using a cup that was normally used during demonstrations on how they are to prepare and consume the supplement that was present at the nutrition unit at the CCC. The number of bicspoons of the supplement prepared and the number of cups of supplement consumed were used to estimate the total amount of supplement consumed in grams. Eighteen spoons of the supplement was equivalent to 300g. The respondents also rated the food's appearance, odour, taste and after taste using, 1-4 with one as very good and 4 as bad.

3.6.2.6 Proximate analysis

Proximate analysis was done to validate the nutrient label information. Proximate analysis is the analysis of foods and feeding stuffs for moisture and dry matter, total nitrogen (protein), ether extract (fats) crude fibre, ash (mineral salts) and soluble carbohydrates. The last is obtained by calculation, by subtracting the other values from 100% of dry matter. A sample of the 1 BP (foundation plus[#]) that was issued to the women was obtained from the Nutrition Department at the CCC. Guidelines for the quantity to be used for analyses was given by Kenya Bureau of Standards (KEBS) where the analyses was carried. The proximate chemical composition of the food is given in Table 10.

1001010.		
Fraction	Major components	Procedure
Moisture	Water and uny volatile compounds	Sample was heated to constant weight at a temperature just above boiling point of water. The loss in water= moisture
Ash (Mineral matter)	Mineral elements	Was burned at 930°F to 1.110°F (500°C to 600°C) for 2 hours
Crude protein	Proteins, Amino Acids and non protein nitrogen	Nitrogen was determined by Kjeldahl Sulphuric Acid digestion
Ether extract (Pat)	Fats, Oils, Oil soluble substance	Extraction with Ether
Crude fibre	Cellulose, hemicelluloses	

TIDIC 10: Proximate enemical composition of the	ί ΠC 100G
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3.6.2.7 Food frequency method

Food frequency is a dictary assessment tool that was part of the questionnaire and was used to collect information on individual dict diversity score (IDDS). This was the type of food

consumed by the HIV* women and frequency of consumption three days before the interview. A food frequency form was used (Appendix 1)

3.7 Data management and analysis

3.7.1 Quality control

The following control strategies were applied: data collection tools were pre-tested and this made the collection and management of data easy and reliable. Close supervision of the enumerator as she collected the information was done by the principal investigator. The principal investigator observed ten percent (10%) of the enumerator's interviews. Anthropometric instruments were calibrated and tested prior to the actual use. The questionnaires that were filled each day were checked thoroughly and appropriate measures were taken in cases where mistakes were identified. Pre-testing of the questionnaire and other data collection tools was conducted to validate and ensure that the questions, tables and forms were well understood and filled correctly by enumerators. The pre-tested questionnaire was modified in relation to the feedback that was obtained. Supportive supervision by a supervisor was also done to ensure that the right data was collected.

3.7.2 Data Entry, cleaning and analysis

Data management using SPSS: - Data entry templates were developed after pre-testing the **questionnaire while data entry was carried out during and after the period of data collection Data validation** - This was done before analysis. The BMI (Kg/M⁻) was compiled from weight **dwided by the square of the height in metres**

Data Analysis. -The data was cleaned using SPSS 12.0.1 for Windows. Using this package, **Diss**ing values, wrong entries and outliers were identified and omitted during analysis, in order

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o avoid the exaggeration caused by them. Classification of weight according to BMI was done using the cut-off points given in the WHO (2000) as shown in Table 11

anic 11. Classification of Nutritional Status according to fimit				
Nutritional Status	Kg m ¹			
Severe underweight	Below 16kg/m2			
Moderate underweight	16kg m2-17 49kg/m2			
Mild underworght	17.5kg/m2-18.49kg in2			
Normal	18 5kg m2-24 9kg m2			
Preubese	25kg m2-29 99kg m2			
Obesity class 1	30kg m2-34.99kg m2			
Obesity class 2	35kg/m2-39.991/m/m2			
Obesity class 3	10kg/m2 and above			

Source. WHO (2000)

Data analysis was first done using initial processing which involved use of cut-off points and baseline data Basic statistics was done using descriptive statistics which included, percentages, means and standard deviation, plus their 95% confidence interval and frequency distribution for categorical data. The second level analysis using SPSS was aimed at establishing significant differences between the various outcome variables. The analysis involved repeated measure of analysis of variance. Strength of relationship between two variables was calculated using Pearson's correlation.

Individual diet diversity score 14 (IDDS 14) was calculated using FAO method based on 14 food groups and a 3 day consumption recall (excluding consumption of the supplement (FAO, 2008).

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to avoid the exaggeration caused by them. Classification of weight according to BMI was done using the cut-off points given in the WHO (2000) as shown in Table 11.

Nutritional Status	Kg m'
Severe underweight	Below 16kg m2
Moderate underweight	16kg m2-17 49kg m2
Mild underweight	17 5kg m2-18 -19kg m2
Normal	18 5kg m2-24 9kg/m2
Preobese	25kg m2-79 99kg m2
Obesity class 1	30kg m2-34 99kg m2
Obesity class 2	35kg m2-39.99kg m2
Obesity class 3	10kg m2 and above

Table 11: Classification of Nutritional Status according to BMI

Source. WHO (2000)

Data analysis was first done using initial processing which involved use of cut-off points and baseline data. Basic statistics was done using descriptive statistics which included, percentages, means and standard deviation, plus their 95% confidence interval and frequency distribution for categorical data. The second level analysis using SPSS was aimed at establishing significant differences between the various outcome variables. The analysis involved repeated measure of analysis of variance. Strength of relationship between two variables was calculated using Pearson's correlation

Individual diet diversity score 14 (IDDS 14) was calculated using FAO method based on 14 food groups and a 3 day consumption recall (excluding consumption of the supplement (FAO, 2008).

CHAPTER FOUR

4. RESULTS

The chapter presents results on socio-demographic characteristics including age, mantal status, economic status and ethnicity. The other results presented include nutritional status of the respondents and nutritional quality of the supplement and the coping strategies by the individual after phase out. Finally it highlights the integration of the supplementary feeding programme to the care and support services at the hospital.

4.1 Socio-demographic characteristics of respondents

This was determined to give background information about the study population.







the sample was limited to between age 20 and 49 years hence, the mean age in years of the 66 spondents was $34.34 \pm 8 13$. The highest proportion of the respondents in the study were within c age range of 30-34 years old representing 26% of the total sample as illustrated in Figure 2. This was closely followed by 35-39 and 45-49 age groups with 20 and 18% of the respondents spectively. The 40-44 age groups had the lowest number of respondents across all the age proportion was 11%.

he distribution of the age of the respondents with the number of months one stayed in the ogramme is displayed in Table 12. An individual was required to stay in the programme for mee months upon which she was expected to have attained a BMI of 18.5 or more and hence scharged.

	Number of months in the programme						
onths	1-3	4-6	>6	Total (n)	(%)		
se Ktonb							
20-24	5	3	0	8	12.1		
25-29	7	2	0	9	13.6		
30-34	13	3	1	17	25.8		
15-39	10	2	[13	19.7		
40-44	4	2	1	7	10.6		
45-49	7	1	4	12	18.2		
Total (n)	46	13 -	7	66			
(%n)	69.7	19.7	10.6		100		

able 12: Distribution of respondents by age and number of months in the programme.

be study showed that the number of months one stayed in the programme was significantly osticized with age in years of respondents (r-.252; p < 0.05).

the study also showed that majority (69.7%) of the respondents had been beneficiaries in the ogramme for between one and three months while 19.7% had been in programme for four to wonths as indicated in Table 11. Only 10.6% had been in the programme for more than six on this of which 57.1% were above 44 years of age. There were no respondents between 20-29 ars who had been in the programme for more than six months.

1.2 Marital status of the respondents

		Marital status	5		
	Married	Single	Widow	Divorced	Total
ge					
1-24	4	2	Ú	2	8
i-29	7	1	1	0	9
-34	8	4	0	5	17
-39	4	4	3	2	13
)-44	2	2	2	1	7
-49	3	3	6	0	12
atal					
n)	28	16	12	10	66
%)	42.4	24.2	18.2	15.2	100

ible 13: Distribution of respondents by age group and marital status

he respondents were classified according to their marital status and age.

s shown in Table 13, the highest percentage (42.4%) of the respondents were married, while e single respondents accounted for 24.2%. The widows accounted for 18.2%, while those who ere divorced accounted for 15.2%. Over three quarters (75.8%) of the respondents were at one me in their lives married; this is summing up the married, widows and divorced. e widowed respondents had the highest mean age of 42 ± 6.4 that was significant (p < 0.05) in that of the respondents in the other marital classes. The other marital classes had mean ages 35 ± 8.6 , 32 ± 7.5 , 31 ± 5.6 for the singles, married and divorced respectively.

3 Ethnicity of the respondents

ost of the respondents were from the Kikuyu community (65%) followed by 18%, 6% and 3% the Kamba, 1 uo and Luhya respectively (Figure 3), while the other tribes accounted for 8% respondents.



gure 3: Ethnicity of respondents.

4 Economic status of the respondents

4.1 Source of livelihood

E livelihood sources for the respondents were mainly small scale business, casual labour, ming and donations.

	Business	Casual	Farmer	Donations	
Marital status					
Married (n 28)	32	11	25	32	
Single (n 16)	25	25	25	25	
Widow (n=12)	8	17	25	50	
Divorced (n - 10)	20	70	0	10	
Total (N-66)	24	24	21	31	
Total (N-66)	24	24	21	-51	

Table 14: Sources of livelihood across marital status Source of invelihood (%)

The respondents who received donations from either relatives or Kenya Network for Women with AIDS (KENWA) were 30%. The remaining respondents obtained income from informal business activities (24%), provision of causal labour (24 %) or farming activities (22%). As indicated in Table 13, half of the widowed respondents received support from either relatives or KENWA while 70 % of the divorced respondents engaged in provision of casual labour in the borticultural farms in Thika, in people's farms or doing laundry work for households. A similar percentage (32%) of those who were married obtained their income from informal businesses that included small retail shops, selling of fruits and vegetables or on support from their spouses. The single women were almost equally distributed across all the sources of livelihood including business, casual labour, and in farming and similar number received donations. As indicated in Table 14, no divorced respondent was involved in farming. Those who were involved in business, 31.2% were also supported by relatives while the rest did not have any other source of fecome. For the casual labourers, 12.5% got support from relatives while 6.3% were involved in Imall scale farming the remaining 68.8% did not have any other source of income. For those who depended on farming as the main source of income, 21.6% were also casual labourers, 7.2%

were also involved in small scale business but 71.9% did not have any other source of income Those who depended on donations, only 9.8% practised small-scale farming.

4.1.4.2 Monthly income

The overall mean monthly income was KSh. 2323.8 \pm 2268.6 while the mean amount of monthly income spent on food was KSh. 2062 \pm 1081. The expenditure on food accounted for 88.7% of the total monthly income spent on food. The monthly income for the respondents was positively correlated to the amounts spent on food (r=0.479, P<0.01). The median monthly income of respondents was KSh. 2000.

4.2 Nutritional status

4.2.1 Supplement consumption and nutritional status

The improvement in the nutritional status of the respondents was assessed in terms of the rates of increase in the BMI among the respondents, according to the total amount of supplement consumed. The nutritional supplement was supplied to the respondents once a month and each received 9000g. It was issued in bags that contained 15 packets each weighing 300g and a packet was to be prepared and consumed per day. The total amount consumed was calculated using the number of cups consumed using a standard cup (300ml). Proper preparation of the daily supplement yielded four cups of porridge. Calculation of avarage monthly consumption showed that there were respondents who consumed 9000g (39%) while others consumed 6000g (48%) and 4500g (13%).





As indicated in Figure 4, the highest percentage of the respondents (48%) consumed 6000g of the total supplement issued while the lowest proportion of the respondents (13%) consumed 4500g of the supplement. About 39% of the respondents were able to consume the full ration of the supplement issued (9000g).

It was not possible to use the total increase in the BMI over a period because the clients had not all joined the programme at the same time. From the Figure 4, 1 or those who consumed full amount of supplement per month, the mean BMI increase was 0.7 with approximate range of 0.00 to 1.45 while for those who consumed 6000g, the mean BMI increase was 0.6 with approximate range of 0.2 to 1. BMI increases for those who consumed 4500g was almost zero with approximate range of -0.4 and 0.4. Using the Pearson's correlation, there was a positive association between BMI and quantity consumed (r=.101) but this was not statistically significant.

4.2.2 Respondents source of livelihood and autritional status

Results on source of livelihood and nutrition status showed that source of livelihood and nutrition status were associated. Those with a regular source of income was better for those who depended on donations.



Figure 5: Respondents source of livelihood and nutritional status

As shown in Figure 5, there was a relationship between BMI and the source of livelihood. A higher number of those who had some source of income had a normal BMI compared to those who depended on donations who had a higher number that was under weight. However, this was not statistically significant. Similarly, the monthly income of an individual also played a role in one's nutritional status. This was arrived at after by plotting respondent's monthly income against WHO classification of nutrition status.



Figure 6: Respondent's income status and BMI

As shown in Figure 6, the respondents who had a normal BMI (29) which accounted for 64.4% had a monthly income that was above the Kenya's poverty line (Ksh 1562). This may imply that the higher an individual's monthly income, the more likely their nutritional status will improve with others factor constant.

4.3 Quality of the Food Supplement

4.3.1 Nutritional composition of the food supplement.

The nutrient composition of the supplement (Foundation & Plus -) as indicated on the label was compared against results from laboratory analysis. This was to validate the contents mainly for proteins and energy. The results of Table 15 shws the label indications and the results of laboratory analysis of 1at, protein and soluble carbohydrates. The Table also shows results of laboratory analysis of moistureand total ash.

ligredient	*u Indicated	% on Analysis	% Difference
Moisture		8.7	
Ash	-	2.1	
Fat	12.0	97	-2.3
Protein	ES.0	13.0	-2.0
Fibre	4.0	3.6	-0.4
Soluble Carbohydrate	61.0	62.9	+[.9

Table 15: Nutrient composition of the supplementary food

The fat, protein and fibre were slightly lower and the soluble carbohydrates slightly higher from laboratory analysis than from the label but the differences were not significant. Based on label indications, consumption of full amount of the supplement supplied 1,350 kcal and 45g of protein per day. From the analysis it means they will consume 1.9% more of the energy and 2% less of the protein which is a total of 1,375.7 kcal and 44.1g of proteins per day.

4.3.2 Organoleptic properties of the supplementary food

Sensory evaluation of the supplement was done using consumers to check whether it was acceptable. As shown in Table 15, almost 82 percent of the respondents said that the food was Bood in appearance and 65 percent said the odour was good. A higher percentage said it was very good in taste and 60 percent said the after taste was very good. Only a very small percentage seemed not to like the supplement. The taste was most preferred by the respondents as almost 73% said that the taste was very good. Only one respondent strongly said she did not like the supplement but takes it because she has had been told it would help her improve her weight.

	Rating by respondents (%) (N=66)				
	Very good	Cloud	Fair	Had	
(baracteristics					
Appearance	9.1	81.8	7.6	1.5	
Smell Odour	18.2	65.2	12.1	4.5	
Taste	72.7	16.7	6.1	4.5	
After taste	60.6	27.3	7.6	4.5	

Table 15 Organoleptic properties of the food supplementary food

4.3.3 Number of months respondents had stayed in the programme

good in taste and 60 percent said the after taste was very good. Only a very small percentage seemed not to like the supplement. The taste was most preferred by the respondents as almost 73% said that the taste was very good. Only one respondent strongly said she did not like the supplement but takes it because she has had been told it would help her improve her weight.

	Rating by respondents (%) (N=66)				
	Very good	Good	Fair	Bad	
Characteristics					
Appearance	9.1	81.8	7.6	1.5	
Smoll/Odour	18 2	65.2	12.1	4.5	
Taste	72 7	16.7	6.1	4.5	
After taste	60.6	27.3	7.6	4.5	

Table 15: Organoleptic properties of the food supplementary food

4.3.3 Number of months respondents had stayed in the programme





The number of months one stayed in the programme were determined by ones nutritional status that is if one had a BMI of less than 18.5 at the end of three months after registration, they remained in the programme. I igure 7, the rate of increase in BMI for those respondents who had stayed in in the programme for 1-3 months, 4-6 months and more than 6 months. Those who had stayed in the programme for one to three months had a BMI monthly increase of 0.66 with approximate range of 0.22 to 1.20 while those who had stayed in the programme for four to six months had an increase of 0.57 with approximate range of -0.05 to 0.66. The least were those

who had been in the programme for more than six months with a mean monthly increase of 0.25 with approximate range of -0.25 to 0.68.

4.3.4 Individual diet diversity score

The individual dietary diversity score (IDDS) aimed to capture nutrient adequacy for the PWHA and was accessed using frequency of consumption three days before the interview. This was by use of other foods consumed by the respondents besides the nutritional supplement issued which were categorized into 14 groups, according to FAO guidelines for measuring diet diversity. The IDDS in percentage is as shown in Table 16.

Oils /fats and cereals were consumed by almost every respondent with marze and Ugali as the main cereal. Vitamin A rich vegetables included the pumpkin and amaranth leaves which were consumed by only 15% of the respondents while the white tubers were not consumed by any of the respondents. Dark green leafy vegetables were predominantly consumed by the respondents with Kales (Sukuma wiki), spinach and traditional vegetables (especially amaranth and night shades) as the most consumed in the group. Similarly, tomatoes were the most consumed in the group of other vegetables. Animal products were sparingly consumed except milk and milk products which was consumed by 74% of the respondents. Beans and green grains were the most consumed of the legumes. In the fruit group 7% consumed the vitamin A rich truits like and ...? a consumed other fruits. Bananas and oranges constituting the main truits consumed

Table	16:	IDDS	by the	HIV	+ women

	% of respondents who consumed the food (N=66)
Food groups	
1. Cereals	98.5
2 Vitamin A rich vegetables and	
tubers	15.2
3 White tubers	0
4 Dark green leafy	
vegetables	95.5
5 Other vegetables	84.8
6 Vitamin A rich fruits	7.6
7 Other fruits	27.3
8 Organ meat (Iron rich)	0
9 Flesh meat	30
10 Eggs	16.7
t1 Fish	16.7
12 Legumes, nuts and seed	89.4
13 Milk and milk products	74.2
14 Oils and fats	100

The distribution of the scores ranged between three and 10 with a mean of 6.6 ± 1.5. The scores for the respondents were as follows, 27.3% of the respondents having a score of six, these were followed by 19.7%, 16.7%, 15.2%, 10.6% and 7.6% who had a score of 7, 8, 5 and 9 respectively, 1.5% had scores of 3 and 10.

The nutritional status was found to be positively significantly associated with IDDS

(r =.259; p <.05).

4.3 Coping strategy by the individual on phase out

4.3.1 Plans for the individuals

The respondents had different plans on phase out. As shown in figure 6 approximately 10 percent of the respondents said they plan to prepare flour which they can use when they are not able to get the supplement. The highest percentage of the respondents (51%) planned to seek assistance from elsewhere with some expecting support from KENWA. Almost 38% said they could plan to eat well, but never gave suggestions as to how they would do it.



Figure 8: Plans for the respondents after phase out from the programme There was no distinct plan in place by the facility after phase out. However qualitative data obtained from the key informants indicated that they would still seek dependence on donor funding. This alternative donor would be looked for when the USAID give notice to wind the programme.

4.4 Supplementary feeding programme and other care and support services

4.4.1 Services available at the hospital and home for the PWHA

Almost all the respondents agreed that they received nutrition counselling, medication (ARVs) and the supplementary food ration from the hospital. They also received treatment whenever they were ill. At home, they took part in the household activities and other income generating activities as source of livelihood for the family. At home the family members were aware about their status and were free to indicate that whenever they were unable to pick their supplementary food, they could send one of the family members.

The food supplement ration supplied to HIV positive women when fully consumed improves their nutritional status. However only 29% of the respondents said that they consumed the full amount of the supplement and results showed that their BMI increases were better than for those who never consumed the full amount. Of the 61% who never consumed the full amount, 12% consumed 4500g while the remaining consumed 6000g and their nutritional status was greatly determined by the amounts consumed. Some of the factors that influence the sharing of the food include household food insecurity and staying in the programme for too long.

The food supplement ration issued to the respondents was found to be adequate in nutritional quality in terms of protein and energy and organoleptically acceptable for the individuals receiving it.

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CHAPTER FIVE

5 DISCUSSIONS

The time it takes for a person to progress from HIV to AIDS depends on the individual's general health and nutritional status. It is therefore important to give nutritional care and support as part of the comprehensive care and treatment of persons infected with HIV. The investigation made emphasis on the demographic and socio-economic factors, anthropometric measurements and dietary adequacy. It also included information on receiving, management and consumption of supplementary food issued at the CCC. It therefore generated data on the implementation of a supplementary feeding programme to HIV⁺ women and recommendations on implementation of such a programme.

5.1 Socio-demographic characteristics of respondents

The study established that compared to other sources of livelihood, those who received donations were more than those in business, casual labourers and farmers. This may imply that majority are not engaged in sustainable income generating activities they can depend on especially for savings that can help them during times when they are incapacitated so as to purchase food. This is because 30% respondents depended on donations while 24% were on casual labour. From the study, with a regular source of income like having a, an individual's BMI was likely to increase as indicated in figure 5. This is in comparison to individuals who depended on donations. Similarly those with monthly income was below the Kenya poverty line (figure 6), had a relatively lower BMI. This might be attributed to the positive association between the monthly income and the amount spent on food. This may imply that the higher the income the higher the

amount allocated for food. Therefore, access to higher incomes most likely enables one to save money for buying food hence better nutritional status.

5.2 Supplement consumption and nutritional status

The study established that a monthly increase in BMI was associated to the total amount of supplement one consumed per month. There was a decrease in BMI monthly increases with the reduction in the total amount of supplement consumed per month. Those who consumed the full amount (9000g) of supplement supplied to them, had higher BMI monthly increases compared top those who consumed less. The majority of those who never gained any weight consumed as little as 4500g. However, this was limited to the number of months one was in the programme. The longer one stayed in the programme the less they consumed and hence less monthly increases in BMI. This may imply that the longer one stayed in the programme, the less compliant and hence drops in monthly increase of the BMI. This might be because of client getting accustomed and consequently shares with family members. Thus staying in the programme for more than three months with consumption of the full amount is adequate for supplementation. However, the results could have been better if an experimental design consisting of respondents with different BMI was used.

Study on effect of supplementation on weight gain of growth faltered under two children in a tural area in Bangladesh found that found supplementation even for as short as 30 days could be beneficial in some children. However, momentum of weight gain does not depend on duration of supplementation and increasing supplementation from 60 to 90 had insignificant effect on weight gain (Tasnim et al, 2007). Similarly, in another study done in Bangladeshi urban slum children

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revealed that during the first months of intervention, the monthly weight gain of supplemented children was significantly higher than the controls, but there was no change in the subsequent three months of supplementation (Fauveau et al. 1992).

Leakage to other members might be due to the organoleptic properties of the food supplement that is issued. From the results the respondents like the appearance, taste, odour and after taste of the supplement. This might imply that it was acceptable by most people and hence easily shared with other members other than the recipient. Some indicated that they shared it with neighbours who were HIV positive to encourage them to attend the CCC especially those who feared due to stigma. Leakage could have also been due to food insecurity in the household as stated by the key informants, the highest numbers of clients were registered between September and early February which is attributed to food insecurity in the homes which affects the nutritional status of the PWHA.

IDDS aimed at assessing the frequency of foods consumed that are rich in key nutrients (animal proteins, fortified food, vegetables, fruits) but does not indicate the quantity of food consumed (FAO, 2004). Apart from maize, and maize flour as the main cereal consumed, milk, vegetables (excluding vitamin A vegetables) plus fats and oils, other foods from the other food groups were consumed minimally (Table 16). This might imply that most of the micronutrient requirements supplied from animal proteins and fruits cannot be met from their diet but mainly through the supplement that they receive. Therefore, energy requirements can be met from the diet alone without supplementation.

5.3 Nutritional quality of the supplementary food given to the respondents

The respondents were in the symptomatic HIV staging with a total energy requirement of between 2410 and 3210. When they consumed the full amount of the supplement (9000g), they received 1350 keal while those who consumed 6000g and 4500g received 900 and 675 keal respectively. To get the required amount of between 2410 and 3210, one was expected to get it from the diet they consumed other than the supplement ration reducing the gap between the individual actual consumption and nutrient requirements. Therefore one required approximately 1034.3 keal from their diet hence the supplement supplied more of the total RDA.

Generally, the food was acceptable to the respondents also appropriate, as it was easy to prepare and consume. Palatability and digestibility are extremely important particularly when providing rations for PWHA, who may have reduced appetite, eating difficulties or gastrointestinal problems such as diarrhoea, nausea and vomiting; the organoleptic results showed that it was appropriate

5.4 Coping strategy by the individual

From the results, the plans that the individuals had to ensure that they continued receiving the nutrients they received from what the supplement supplied, had the highest percentage planning to look for assistance from elsewhere. This implies that there is no sustainable plan that will ensure they continue meeting their diet requirements. Given that, result on the quality of the supplement showed that the supplement supplied the individuals with relatively higher amounts of keal than what they will require from the diet to have the RDA, there is need t have a sustainable system in place like in the community.
In a supplementary feeding programme implemented by the ministry of health in Zimbabwe, it had a long term measure of meeting the nutritional requirement of the affected children which can be replicated in other supplementary food programmes. This was by local production of supplementary food through establishment of communal plots. Through the communal farming enterprise, the weaker people in the community were helped by the better off members who farmed with them, and by technical support given by government agricultural extension workers, the beneficiaries are able to meet their nutritional needs even after phase out (FAO, 2003).

5.5 The integration of the supplementary feeding programme into the care and support services

Nutrition education and counselling are integral to providing nutritional care and support to PWHA. They are important in letting the individual understand the need to maintain an adequate diet and how to manage common health problems related to HIV that may negatively affect the nutritional status. This service is provided at the hospital when nutrition counselling is done to the individual to examine the options one has and help them make the best choices. However nutrition counselling is not done by conducting a dietary intake and habit assessments. Reviewing of previous advice is necessary as food habits are difficult to change and hence suggestions on new realistic changes are important.

CHAPTER SIX

6 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

The findings of the study showed that supplementation using (FBP) played a positive role in mitigating the impact of HIV/AIDS among the individuals through the reduction of the gap between the individual's actual consumption and nutrient requirements. Although the impact of supplementation was assessed using the nutritional impact produced by consumption of the full amount received, duration and income status are major factors that influence the quantities consumed and thus the nutritional status

6.2 Recommendations

BMI is used to determine whether someone should receive food supplementation. While BMI is important, the study suggests the need to identify more focused and context specific indicators such as household size, number of income earners and source of livelihood need to be included as part of the assessment. These will tell the likelihood of leakage of the supplement to other members of the household.

There is need to start or encourage set-up of community based supplementation programmes that are developed to address the need for food supplementation within HIV/AIDS treatment program which will have long term benefits.

Finally, nutrition counselling should include the diet assessment so that one is advised appropriately and should not only be done once at the time of registration but should be offered throughout the entire of the programme. Counselling should also include knowledge on how to combine foods into meals providing sufficient essential nutrients for PWHA. This will help them provide adequate nutrients from meals based on foods available from the homes.

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APPENDICES

Appendix 1

Confidential

.

Survey questionnaire

This questionnaire seeks information from you in relation to the supplementary food that you receive from this health centre. I'm requesting you to voluntarily answer the questions. The information I will get will only be used for this research study and will handle it with care and confidentiality

Resp. no.

Do you consent to participating in this study?

organisation

I. Demographic information

Date dd/ mr	n/ут	Respondent No
Time start		Time end
Name of interview	wer	
Name of respond	ent	
Tribe	***	
Marital status		
I= Married	2= Single	
If married, what i	s your spouse's tribe?	
When were you r	egistered in the program	
Month	Year	

Let me know the members of your household?

[Use the codes below to key in the responses from the respondent]

No	Names member	of	ΠВ	Sex	Age in years	Do they eat ration
1						
2						
3						

Sex	Do they eat ration
I=Malc	1= Yes
2=Female	2- No

Economic Status

2. What is you main source of livelihood?(I ill in the space provided below)

3. What are your other sources of livelihood?

4. On average, how much do you earn per week? Ksh------

5. On estimate how much money do you spend on the following items per week or month?

(1 ill in the space provided below)

Goods and services	[xpen	diture
	KSh week	KSh month
Food		
Rent		
Fuel		
Water		
Others(Specify)		

6. How often do you collect the ration? (Specify in the space provided)

7. Which days of the week? (Indicate in the space provided)

8. Does this confli	ct with another of your other activities? (Tick appropriately)
1 Yes	2= No
9. If yes, what hap	opens(Explain briefly)
10. Can someone e	lse collect the ration on your behalt? (Tick appropriately)
1= Yes	2-No
11(a) Do you lear b	seing seen collecting the ration?(Tick appropriately)
1=Yes	2- No
(b) If yes, why?	
(Specify in the spa	ce provided)

12. Are there times	you have failed to collect your ration? (Tick appropriately)
1= Yes	2= No
13. If yes, why?(Sp	secify in the space provided)
il	01000000
jii.	

Health and Nutrition

13. Anthropometric Assessment

(Fill appropriately)

	Weight (Kg)	Height (Meters)	CD4 Count (a point of entry	BMI point entry	(ā) of
1					
2					
Average					

14. Have you had any illness for the last 1 month? (Specify illness and the action taken in the space provided)

liiness	Action	

16. Record number of days ill during one month period.

17. What food supplement are you given?

(Specify in the space provided type and use the codes for how often received)

Food supplement	Frequency received
-Once a week	2=Once every two weeks

3- Once a month

18 (a) How of much of the food supplement do you receive in grams?(Please specify below)

l._____ 2. 3. 4.

(b) low much do you eat per day? (Indicate in the space provided below)

(c) How many days is the food supposed to last? (Specify in the space provided)

19. Does the supplement last you till the next visit? (Circle appropriately)

1-Yes 2=No

20. If no, what are the reasons? (Please specify below)

1. _____ 2.

3. 4.

21 Of the total amount, how much do you actually consume in grams? (Indicate in the space below)

22(a) What can you say about the food supplement?

(Use the codes below the table to fill appropriately)

Characteristics	Rating		
Appearance			
Smell/ Odour			
Taste			
After taste			
L-Verv good	3= Fair 2-Good	4= Bad	

(b) Do you like eating it? (Circle appropriately)

I+Yes 2=No

(c) Why or why not? (Indicate in the space provided)

Food frequency

23. In the last 3 days, what foods did you consume? (V) the appropriate in the box provided

Carbohydrate	5	
Ugali	aYes	ΠNυ
Rice	QYes	nNo
Sweet potatoes	oYes	DNo
Maize	oYes	DNo
Polatoes	OYes	DNo
Bread	D Yes	ΠNo
Other (Specify)		
	oYes of	lo
Proteins		
Meat	aYes	DNo
Fish	OYes	DNo
Beans	@Yes	
Green grams	OYes	⊡No
Milk	DYes	DNo
Egg	□Yes	ΠNo
Others(Specify)	
	aYes	ciNo

Sukuma wiki-Sninach	DYes	σNo	
Traditional Vegetables		σY	CS
		CN	0
Cabbage	OYes	aNo	
Amaranthus	QYes	oNo	
Bananas	QYes	DNo	
Mangoes	aYes	DNo	
Pincapples	aYes	DNo	
Ornerstern	DYes	DNo	***********
Lemons	UYes	DNO	
Others			

24. What other services do you receive at the health facility when you come to collect your ration which you could not receive if you were not getting the food supplement?(Fill in the spaces provided below)

 	 -	
	 	_
the second se		

25. How far in Km is the CCC from your home?

26. What is your general comment about this supplementary food program? (Write in the space provided below)

27. What suggestions can you give on how it can be improved so as to serve your nutritional needs hetter?

1	 	 	
2	 	 	
3	 	 	
4			

28. What is your view about the service providers? (Circle appropriately)

1-Kind	2= Cruel 4= Impatient in explaining			
3=Spend time explaining				
5= Knowledgeable	6 Not conversant with what they offer.			

29. How do you manage supplement when travelling? (Please specify below)

١		
2.		

3.

30. If the program winds up today or you are phased out of the program, how will you or your family ensure that you continue meeting your nutritional requirements? (Fill in the space provided below)

1	_		 	
2.			 	
3			 	
4				
5.		_		

Human rights and HIV

31. Are you aware of the rights of people living with HIV/ AIDS? (Circle the appropriately)

Appendix 2

Key informant guide

Date / /

Name of the respondent

Sex_____

- Job Title at the Health centre_____
- 1. When did you start this program at this health centre?
- 2. What were the objectives of the programme?
- 3 Who are the majority in programme and why do you think they are more?

Age

- 4. Is there any stigma that is associated with the collection of the nutritional food supplement?
- 5. How much ration do you give them and for how long?
- 6. How do you ensure that the amount you give is consumed by the clients and not shared at home?
- 7. How long does one stay in the program and how do you phase them off?
- 8 How do they meet their nutritional needs after phase off?
- 9. In your opinion, what can you say about the program and how can it be improved?

Appendix 3

Facus group discussion guide

- 1. In your opinion, is it necessary to receive this supplementary food ration? Why
- (a) I would like to know how much you receive and how much of the supplementary food you take per day

(b) Is it adequate?

- 3. For those of you who have children, do you sometimes mix it with their food? Why?
- 4 What information do you normally recieve before being given the supplement?
- 5. (a) Is the food supplement beneficial to you?(b) What do you think will happen to you if you are not able to get the supply from here?
- Please give suggestions as to what you can do as individuals and as a group so as to still meet your nutritional needs if the program ends.
- Give suggestions as to what can be done in similar program to be very successful in meeting nutritional requirements for people who are HIV positive.

Appendix 4

Training curriculum

Introduction-What this curriculum is all about

This curriculum is designed to guide the training of research assistants who will undertake the collection of data during my research that will take place at Thika district hospital on nutritional impact on women (20-49 years) with HIV and AIDS phase out structures of a supplementary feeding programme.

The purpose of the curriculum is to develop competencies to perform the specified job during the research period starting July to October. The minimum qualification for the assistant is Kenya Certificate of Secondary Education (KCSE). The training will take three days.

Training methodology

A range of training techniques will be used which encompass lecture, discussion, demonstration and practical

Objectives:

By the end of the training the learner will be able to:

- 1 Explain the ethics and rights of respondent
- 2. Take weight, height and fill detail in the questionnaire
- 3 Interview the clients within 30mins
- 4. Introduce themselves well and assure clients of confidentiality
- 5 Ethics and rights of respondent
- 6. Right to be respected
- 7 Obtain consent from them before interviewing them
- 8. Maintain confidentiality of the client not discussing them with other people.

Taking weight and height

Weight

4

Using a bathroom scale, the zero weight on the scale should be checked before any weight is taken.

Scale should be placed on a flat hard surface

The subject will then stand still in the middle of the scale without touching anything and the with the body weight equally distributed on both feet

Read the weight to the nearest 100gms.

It should be taken twice and an average is then calculated. Note: This will be taken for those clients who are able to stand

Height:

Using a heightometer, the subject will stand with heels together, arms to the side, legs straight, relaxed and bear foot. Position the head in the horizontal plane and let the subject look straight ahead The heals, buttocks, shoulder blades and back of the head should be against the vertical board of the heightometer Measurement should be read to the nearest o.lcm Ensure that the eye level should be with the headboard to avoid errors due to parallax Interviewing Start by introducing yourself Explain the purpose of the study and assure the client confidentiality Ask for consent

Record time started and time you finish ensuring that you take not more than 30 minutes.