



MAKERERE UNIVERSITY

FACULTY OF AGRICULTURE

DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY

**FACTORS INFLUENCING THE NUTRITIONAL STATUS OF
WOMEN OF REPRODUCTIVE AGE IN
ERUTE INTERNALLY DISPLACED PERSONS' CAMP-LIRA DISTRICT.**

BY

AGETTA GRACE L. KOMAKECH

**A THESIS SUBMITTED TO THE DEPARTMENT OF FOOD SCIENCE AND
TECHNOLOGY IN FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF A
MASTER OF SCIENCE DEGREE IN APPLIED HUMAN NUTRITION OF
MAKERERE UNIVERSITY**

AUGUST 2010

DECLARATION

I, Agetta Grace L. Komakech, hereby declare that the work contained in this report, is original and has not been presented partially or in total to any institution for publication, academic award or other use.

SIGNED

.....

Date:

SUPERVISORS:

Associate Professor A.N. Kaaya (PhD)

.....

Date:

Dr. C. Muyanja (PhD)

.....

Date:

DEDICATION

This work has been dedicated to my family who patiently endured the difficulties caused by my absence and busy schedule during the programme. May the Good Lord bless and reward them abundantly.

ACKNOWLEDGEMENT

Sincere gratitude goes to my supervisors associate professor .A.N. Kaaya and Dr.C.Muyanja who helped me shape this thesis report. Am very thankful to the Ministry of Education - Uganda whose financial support enabled me to attend the programme. Appreciation is made of my colleagues, John Bukusuba, Jennifer Mugisha and Robert Rwamukwaya who persistently reviewed the many drafts and helped make relevant adjustments. I am greatly indebted to the internally displaced women of Erute IDP camp, Lira District who enthusiastically participated in the study. This work would not have been possible without the support of my husband, Mr. Richard Komakech and my children, Barbara, Daniel, Denis, Rachael, Emmanuel, Moses and Happy. Finally I would like to thank Mrs E. Gabona whose support and parental guidance enabled me to complete this course. To all those who in one way or another contributed to the making of this report, I will always be grateful.

DEFINITIONS OF TERMS

Adequate Diet: Is a diet that contains sufficient energy from staple foods (e.g. cereals, roots and tubers), fat/oil, legumes, and adequate amounts of micronutrients (vitamins and minerals) from vegetables, fruits meat and fish.

Anthropometrics: Measurement of the human body e.g. weight, height, mid-upper arm circumference (MUAC).

Conflict: It is a term used by the development community, usually intended to denote violent conflict

Food Security: Is defined as existing when “all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life”. (FAO, 1996).

Insurgency: An organized movement aimed at the overthrow of a constituted government through use of subversion and armed conflict.

Nutritional assessments: Measurements of body size, body composition, or body function, intended to diagnose single or multiple nutrient deficiencies.

KAP: Knowledge, attitudes and practices.

GAM: Global acute malnutrition: proportion of children with a weight / height index < -2 Z-scores or oedema.

SAM: Severe acute malnutrition: proportion of children with a weight/ height index < -3 Z-scores or oedema.

Body Mass Index (BMI): is used as an indicator for adult nutritional status. BMI is an indicator that is supposed to reflect thinness, by measuring weight and controlling for height. BMI is calculated as $\frac{\text{weight}}{\text{height}^2}$.

LIST OF ABBREVIATIONS

IDP	Internally Displaced People
IDW	Internally Displaced Women
LRA	Lords resistance army
BMI	Body Mass Index
MUAC	Mid Upper Arm Circumference
UBOS	Uganda Bureau of Statistics
GAM	Global Acute Malnutrition
ACF	Action against Hunger
SAM	Severe Acute Malnutrition
UNOCHA	United Nations Office for the Coordination of Humanitarian Affairs
MSF	Médecins Sans Frontières
FEWS NET	Famine Early Warning Systems Network
UPDF	Uganda Peoples Defence Force
IMR	Infant mortality Rate
ICN	International Conference on nutrition
HRW	Human Rights Watch
RI	Refugee International
GFDs	General Food Distributions
CMR	Crude mortality rate
RDAs	Recommended Dietary Intakes
STIs	Sexually Transmitted Diseases
MISP	Minimal Initial Services Package
ISIS-WICCE	Isis-Women's International Cross Cultural Exchange
OCHA	Office for the Coordination of Humanitarian Affairs
DDHS	District Director of health Services
NGO	Non governmental Organization
FBA	Food Based Approach
WHO	World Health Organization
WFP	World Food Programme
KAP	Knowledge Attitude and Practice
USA	United States of America
FAO	Food and Agricultural organization
UNICEF	United Nations International Children Education Fund
HIV/AIDS	Human Immuno-deficiency Virus/Acquired Immune deficiency syndrome

TABLE OF CONTENTS

Declaration	i
Dedication	ii
Acknowledgement.....	iii
Definitions of terms.....	iv
List of abbreviations	v
Table of contents	vi
Abstract	ix
Chapter one.....	1
1.0 Introduction.....	1
1.1 Background	1
1.2 Health and Nutrition Conditions of women in IDPs	3
1.2.1 Food insecurity	3
1.2.2 Poverty	4
1.3 Problem Statement	5
1.4 Objectives	7
1.4.1 Overall objective	7
1.4.2 Specific objectives	7
1.4.3 Hypothesis	7
1.5 Significance of the study	7
Chapter two	8
2.0 Literature review	8
2.1 Malnutrition among women of reproductive age in IDP camps	8
2.2 Vulnerability of women in IDP camps	9

2.3	Conflict and displacement in Northern Uganda	11
2.4	Impact of war/conflict on women's health	14
2.5	Food distribution to IDP camps in Uganda	16
2.6	Health, Nutrition and the status of women in IDP camps.....	17
2.7	Factors that determine maternal health and nutrition	18
2.7.1	Maternal education.....	18
2.7.2	Knowledge, attitudes and practices (KAP)	18
2.7.3	Pre-existing under nutrition among women	20
	 Chapter three.....	 22
3.0	Materials and methods.....	22
3.1	Study setting.....	22
3.2	Study design.....	22
3.3.1	Study population.....	22
3.3.2	Study subjects	22
3.4	Sampling methods	22
3.4.1	Sample size establishment	22
3.4.2	Sampling technique	23
3.5	Data collection methods and instruments	23
3.6	Measurements	24
3.6.1	Determination of nutritional status of women.....	24
3.6.2	Determination of dietary intake	24
3.6.3	Determination of adult equivalent unit measure of calories	25
3.7	Data Analysis.....	25
3.8	Ethical Considerations	26
	 Chapter four	 27
4.0	Results and discussion	27
4.1	Social demographic characteristics of IDW.....	27
4.1.1	Age of IDW.....	27

4.1.2	Education level of IDW.....	27
4.1.3	Marital status of IDW.....	27
4.1.4	Source of income.....	28
4.1.5	Household size.....	28
4.2	Nutritional status of IDW in Erute camp.....	31
4.2.1	Nutritional status of IDW in Erute camp by BMI	31
4.2.2	Distribution of Nutritional status of women (MUAC) by age group.....	32
4.3	Dietary Intake of study women	32
4.3.1	Frequency of Food consumption among the studied women	34
4.4	Factors affecting nutritional status.....	34
4.4.1	Age	35
4.4.2	Marital status of IDW	36
4.4.4	Household size	37
4.4.5	Previous nutrition Knowledge	38
4.5	Risk factors associated with malnutrition in Erute IDP Camp	40
	Chapter five	42
5.0	Conclusions	42
5.1	Recommendations	42
	References	44
	<i>Appendix 1: Research questionnaire</i>	<i>57</i>

ABSTRACT

Introduction: More than 1.5 million Ugandans were displaced and lived in camps from 1996 to 2005. The camp conditions were associated with poor sanitary facilities, disease and malnutrition among women and children (WFP 2004). **Objectives:** to establish the underlying factors influencing the nutritional status of women of reproductive age in Erute Internally Displaced Persons (IDP) camp. **Methods:** A cross sectional survey involving non-pregnant and non-lactating women of reproductive age (15 - 49) was carried out in Erute IDP camp-Lira District, Northern Uganda (May-July 2005). Data was collected by structured, food frequency questionnaires (FFQ) and included socio-demographics, food security, dietary intake and nutrition knowledge. The nutritional status of women was assessed by anthropometric methods (weight, height, and mid upper arm circumference (MUAC) measurements). **Results:** A total of 224 women, most (60%) of whom were young (<25years) single or widowed (64%) had low levels of education (46.3%) and were of low socioeconomic status, were investigated. A significant proportion (48.7%) were underweight with a mean BMI of less than 18.5% while 3.5% were overweight and 1.0 % was obese. The mean MUAC among study women was 25.5 ± 6.3 cm. Younger women were more likely to show low BMI and or MUAC compared to older women ($p < 0.05$). There was indication of inadequate dietary intake due to insufficient food available at the household level and consumption of calories from low cost staple foods. The main foods consumed by study women were; maize flour, beans, and vegetables. Corn-soy blend and vegetable oil were given by WFP on a 3 monthly basis. **Conclusions:** The nutrition status of IDW in Erute IDP camp was poor. Low socio-economic status, inadequate information/knowledge, poverty and low educational levels greatly undermined the women's welfare and were key contributors to poor nutritional status. **Recommendations:** To improve the nutrition status of IDW in Erute IDP camp, interventions should target raising their socio-economic status through providing information, education and alleviating poverty levels among IDW.

CHAPTER ONE

INTRODUCTION

1.1 Background

The loss of livelihoods, together with the disruption of social and cultural norms, has a negative impact on the availability of, access to utilization of food. This can lead to increased levels of malnutrition, which is manifested as macronutrient (protein, energy) and or micronutrient deficiencies. Malnutrition is one of the most important health and welfare problems among women in Uganda and the rest of the developing world. It is usually a result of a combination of inadequate dietary intake and infection (Kakitahi, *et al*, 1981). Inadequate food intake is a consequence of insufficient food available at the household level, improper feeding practices or both. Feeding practices include both the quality and quantity of foods taken by the individual. Poor sanitation puts women at increased risk of illness, which affects their nutritional status. Both inadequate food intake and poor environmental conditions reflect underlying social and economic conditions (UBOS, 2001). It has been reported that dietary factors concerning the mother, socio-economic and environmental factors contribute to the risk of malnutrition in developing countries. Kakitahi *et al*, 1981 and Kikafunda *et al*, 1998) also reported that the major risk factors for maternal malnutrition in Uganda had been identified as short birth intervals, poor feeding practices, low – energy and nutrient dense foods, low maternal education, use of water from unprotected sources, lack of fuel and low social economic status of the households.

The United Nations World Food Programme (WFP) reported global acute malnutrition (GAM) rates of 19.8% and 19.7% for Kitgum and Pader districts in northern Uganda respectively (WFP, 2004), while Action Against Hunger-USA (ACF, 2003) reported a chronic malnutrition rate of 41.4% among under-fives in Gulu district in Uganda. Internationally, a level of wasting greater than 40% indicates a crisis that is out of control (FAO, 2005). In June /July 2004, WFP reported that malnutrition had declined in severity in the three districts. The GAM rate in Kitgum IDP camps ranged from 7.4 – 18.3% of children less than five years, and from 4.4- 12.2% in Pader district. A reduction in severe acute malnutrition (SAM) rates was also reported in nearly all camps in June/July 2004. In Kitgum district SAM ranged from 0.8 - 3.8% and Pader district it ranged from 0.9 – 3.8%, with over half of the IDP camps experiencing high malnutrition rates

above 10% (UNOCHA, 2004). Medecins Sans Frontiers (MSF, 2004) also reported rates of SAM at 4.4% and GAM of 8.2 % for Lira and Pader districts, with an under fives' mortality rate of 5.4/10000/day, indicating a catastrophic situation according to international standards (FAO, 2005).

According to United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA), by the year 2005, there were 1,670,000 internally displaced persons (IDPs) living in rural camps in the Northern and Eastern parts of Uganda mostly women and children (UNOCHA, 2005a). Out of these, 1,117,000 were found in the three Acholi districts of Gulu, Kitgum and Pader, representing 90 – 95% of the sub - region's population. In the Lango sub - region, there were a total of 474,000 IDPs in Lira and Apac districts; and despite the restored peace in the Teso sub-region then, there were 80,000-100,000 IDPs in Katakwi district, most of whom had escaped Karimojong cattle rustling. However, IDPs in the Lango and Teso sub- regions would commute between the camps and their villages of origin, unlike their compatriots in Acholi-land. Furthermore, in 2004, there were an estimated 200,000-300,000 IDPs living in urban areas such as Gulu, Kitgum, and Lira and in the neighbouring districts of Adjumani, Masindi and Hoima. Therefore, the total number of IDPs in northern Uganda was estimated at between 1.9 and 2 million, with 1.4 million (in rural Acholi and Lango camps) depending on WFP relief food assistance to meet their net food gaps (UNOCHA, 2005b).

Under normal conditions, the majority of the population in northern Uganda are dependent on agriculture to supply their food needs, and to provide income with which to supplement their subsistence production (FEWS NET, 2005). As a consequence of the delayed progress in the peace process, it will take some time for the IDPs to become food self-sufficient. In emergency situations such as the Lords Resistance Army (LRA) insurgency in northern Uganda, food security is often severely threatened, causing increased risk of malnutrition, disease and death. Emergency health workers/organisations have the responsibility to try to cure the malnourished, prevent malnutrition among the vulnerable and promote adequate distribution of food to allow a healthy existence (Toole and Waldman, 1990).

In the Teso sub-region and southern Lira district, relative peace prevailed following a combined

effort by the Uganda Peoples Defence Forces (UPDF) and local militias, who forced the LRA out of the two areas in early/mid 2004 (UNICEF, 2005). Thus an estimated 350,000 IDPs were able to return to their areas of origin, with the exception of 80,000 in Usuk County, Katakwi district, which feared both Karamojong and LRA raids (UNICEF, 2005). Similarly, in Lira, an estimated 60,000 IDPs from Lira municipality (75% of the original number) had returned to rural camps closer to their villages of origin, cautiously accessing their fields.

A survey conducted in 2005 by GOAL (an Irish Humanitarian Relief Organization) in three sub-counties in Pader district indicated that the humanitarian consequences of the environment at the time included congestion in the camps, with poor water and sanitation, which caused cholera outbreaks (UNICEF, 2005). There was also the “night commuter” phenomenon (night commuters” are children who regularly moved from insecure areas to shelters or other locations within urban centres such as on verandas and in the streets to sleep at night)(UNICEF, 2005). The phenomenon was a serious issue as the children most especially girls were exposed to abuse and the risk of sexually transmitted diseases, including HIV/Aids.

1.2 Health and Nutrition Conditions of women in IDPs

1.2.1 Food insecurity

UNICEF (2005) reported that inappropriate assistance, particularly in the quantity and quality of food assistance, increased the vulnerability of women and girls to sexual abuse and exploitation. Inequitable distribution of resources within camps resulted in women having inadequate access, particularly to food, forcing them to resort to coping strategies that put them at greater risk of sexual violence and HIV/AIDS. Some women and girls were compelled to engage in transactional sex because they lacked livelihood options to help fend for their families. In many cases, these amounted to “survival sex” which occurred when displaced women and girls had no economic alternatives (MoH, 2005). Displaced women were also at particular risk due to having to assume multiple roles, including those of single mothers, caretakers and breadwinners. The additional responsibilities, without additional or adequate resources, often left women with few options but to prostitute themselves.

Food insecurity was prevalent in Lira IDP camps as well as among urban displaced populations living on the margins of society (FEWS NET, 2005). Food insecurity can be a result of many factors such as: inadequate food baskets that do not meet minimal caloric standards, food distributions which may meet caloric requirements but lack nutritional value, breakdowns in the food assistance pipeline, ration cuts due to funding problems and the selling of rations to meet other basic needs (MoH, 2005). Further, when inadequate food rations are distributed, women would often be the first to deny themselves food in favour of others, particularly their children and male partners. This resulted in malnutrition and high morbidity and mortality rates among women in IDP camps.

In urban settings of Lira, food insecurity was particularly noted to be problematic as access to humanitarian assistance and income generation activities were often minimal. Women who managed to find employment to earn money for food were found to suffer from discrimination, harassment and exploitation by their employers or fellow employees and would be paid far below market wages because of their uncertain legal status (FEWS NET, 2005).

1.2.2 Poverty

Extreme poverty and the inability to adequately provide for self and family, lack of economic opportunities and economic dependency on others led to a host of risks (MoH, 2005). For example, the women and girls had particular difficulties in leaving or avoiding risky relationships. The financial vulnerability of women and girls was linked to their lack of access to productive resources such as land, property, credit, training and education (UNICEF, 2005). Rampant poverty exposed women and girls to all types of exploitation, including trafficking. Faced with malnutrition, hand to mouth survival and potential starvation left women with few options (MoH, 2005). They became particularly susceptible to transactional sexual relationships (that is, exchange sex for food or other assistance or services). They lacked understanding and education on sexually transmitted infections, including HIV/AIDS. Further, most were burdened with overwhelming responsibilities: caring for children, at times as head of a female - headed family; performing multiple domestic tasks, such as cooking, cleaning, fetching water; and collecting firewood for either their own family or other families. Consequently, they were unable to attend school or participate in normal developmental activities that could have helped mitigate vulnerability to risk (UNICEF, 2005).

1.3 Problem Statement

Malnutrition has significant health and economic consequences. The most serious of which is increased risk of death. Other outcomes include an increased risk of illnesses and a reduction in workers' productivity and increased absenteeism in the workplace; these reduce a person's lifetime earning potential and ability to contribute to the national economy (MoFPED, 2000). In women of reproductive age, malnutrition can result in adverse pregnancy outcomes (UNICEF, 1998).

The maternal and infant health and nutrition conditions of women in conflict areas are poor, compared with the rest of the country. The situation is especially worsened in IDPs whose environment is not conducive to proper infant growth and development. For example, the Infant Mortality Rates (IMRs) were 290 per 1,000 births, 274 per 1,000 births, and 274 per 1,000 births for Gulu, Kitgum and Lira, respectively in contrast to the national average which was 88%

(MoH, 2004) Part of the problem to the prevailing situation then, was the education conditions in northern Uganda. Education in northern Uganda had been severely affected due to the destruction of school buildings, looting of books and burning supplies, or the targeted killings and abduction of teachers and children by the LRA. Many schools had been closed or displaced, and many children were not attending school. The forceful displacement of people from homesteads into the camps had resulted in overcrowding and lack of basic supplies, including adequate water and sanitation facilities, which led to health and therefore nutritional problems among resident populations. The most affected group had been the children under five. Latrine coverage was estimated at over 145 persons per latrine stance as compared to the standard of 20 persons per stance, for emergency situations (MOH, 2004) Water provisions were also not adequate in IDP camps in northern Uganda: availability of water from non-rain water sources was between 4-12 litres per person per day when the emergency standard is at 15 litres per person per day.

As a result of poor environmental conditions, malnutrition was acute especially in IDPs and particularly Erute IDP camp, which was the largest. Malnutrition in Erute IDP was noted as the underlying cause of infant death then, though parents also reported diarrhoea, fever and respiratory infections as being the main cause of mortality. For example, results of a nutrition survey conducted jointly by World Food Programme (WFP) and the Ministry of Health in Anaka and Pabbo IDP camps in Gulu indicated that the malnutrition rates of children under-five in IDP camps were 31% and 18%, respectively.

In response to the nutritional problems in Northern Uganda in general and particularly the IDPs, different parties took several measures. For example, the Government of Uganda, World Bank and other international organisations implemented several programmes in the northern region aimed at reconstructing and revamping of health programmes to improve the infant nutritional status. Activities of the programs included: Firstly, institutional development to strengthen nutritional based project management capacity, disseminate information, monitor and evaluate activities; secondly, capacity building at the local government and community level, to undertake bottom up planning, deliver and manage health services, mobilise and organise communities for peace building and conflict management; and thirdly, infrastructure development (roads, water

and sanitation, livestock and classrooms). A glaring lacking ingredient of these programs had been the exclusion of assessment of maternal nutritional status despite studies in other parts of the world having observed a strong correlation between maternal nutritional status and infant nutritional status. Maternal care, which is the provision in the household and the community of time, attention and support, has been shown to enhance not only the nutritional status but also physical, mental, and social needs of the growing child and other household members (ICN, 1992).

This study therefore sets out to assess the nutritional status of women of reproductive age in Erute IDP camp receiving food AID with a view to support health policy makers to devise strategies which will further enhance improved infant nutritional status through better maternal nutritional status.

1.4 Objectives

1.4.1 Overall objective

To establish the factors influencing the nutritional status of women of reproductive age (15-49) in Erute IDP camp.

1.4.2 Specific objectives

1. To describe the socio-demographic characteristics of women of reproductive age (15-49) in Erute IDP camp.
2. To determine the dietary intake and nutritional status of women of reproductive age (15-49) in Erute IDP camp.
3. To identify risk factors associated with malnutrition among women of reproductive age (15-49) in Erute IDP camp.

1.4.3 Hypothesis

H_A = Despite the humanitarian and food aid given to people living in IDP camps in Northern Uganda, the dietary intake and nutrition status of women of reproductive age in Erute IDP camp are poor.

1.5 Significance of the study

Malnutrition has significant health and economic consequences, the most serious being increased risk of death. Other outcomes of malnutrition include an increased risk of illnesses and a reduction in workers' productivity and absenteeism in the workplace; these reduce a person's lifetime earning potential and ability to contribute to the national economy. In women of reproductive age, malnutrition can result in adverse pregnancy outcomes.

This study set out to investigate the trend and cause of macro- and micro- nutrient deficiencies that accelerate maternal mortality, morbidity, poor development and performance in IDW in Erute IDP camp, as well as providing data to the Ministry of Health, policy makers and all stakeholders necessary for designing interventions that can enhance the impact of food aid particularly in IDP camps.

CHAPTER TWO

LITERATURE REVIEW

2.1 Malnutrition among women of reproductive age in IDP camps

The loss of livelihoods, together with the disruption of social and cultural norms, has a negative impact on the availability of and access to utilization of food. This can lead to increased levels of malnutrition, which is manifested as macronutrient (protein, energy) and or micronutrient deficiencies. Malnutrition is one of the most important health and welfare problems among women and children in Uganda and the rest of the developing world. It is usually a result of a combination of inadequate dietary intake and infection. In a study to investigate risk factors for early childhood malnutrition in Uganda, (Kikafunda *et al* 1998), feeding practices included both the quality and quantity of foods taken by the children. The study demonstrated that inadequate food intake was a consequence of insufficient food availability at the household level, improper feeding practices or both. Both inadequate food intake and poor environmental conditions reflect underlying social and economic conditions (UBOS, 2003).

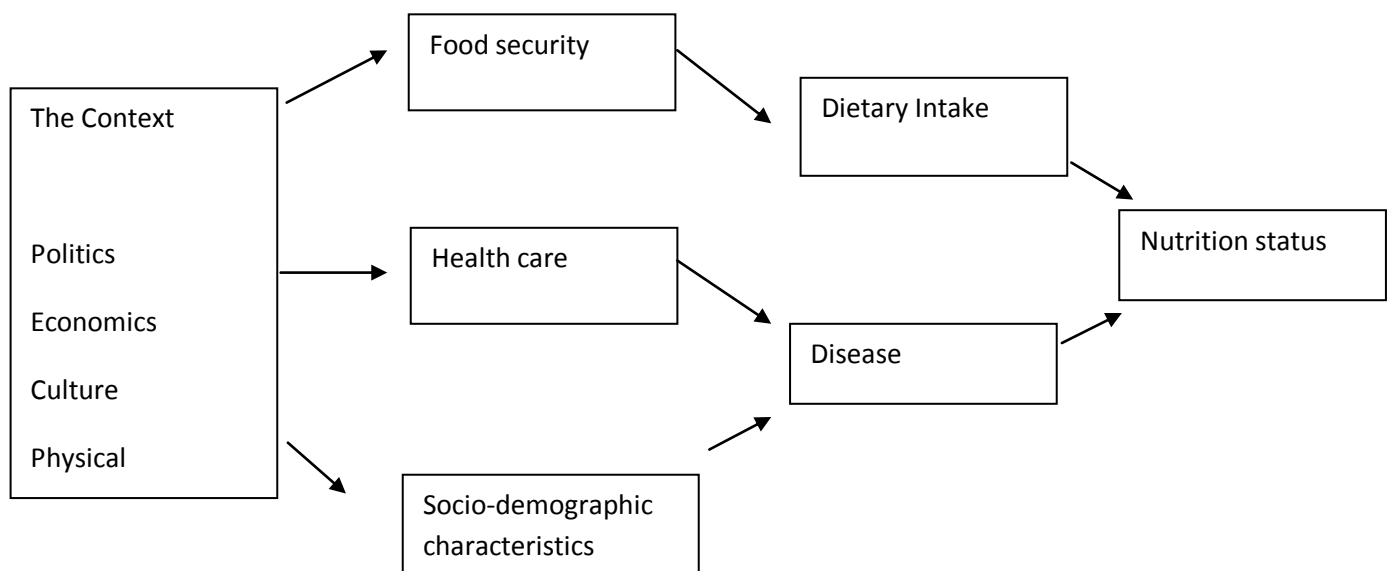
Poor sanitation put children at increased risk of illness, which affected their nutritional status. These are factors that also influence the nutritional status of an individual. Similar studies in the Africa region have also reported that dietary factors concerning the mother and socio-economic and environmental contribute to the increased risk of malnutrition (Kikafunda *et al* 1998), In Uganda, the major risk factors for maternal malnutrition included; short birth intervals, poor feeding practices, low – energy and nutrient dense foods, low maternal education, use of water from unprotected sources, lack of fuel and low social economic status of the households. Conclusions were made based on women and child data from Western Uganda. However nutrition data on women and children in Northern Uganda is still limited. The extent to which similar factors influence the nutritional status of women in IDP camps needs to be evaluated.

2.2 Vulnerability of women in IDP camps

According to a study carried out by WFP (2004), food production in Uganda had not kept pace with population growth. Growth in food production was estimated at 2.2% while population growth was estimated at 3.4%. The primary causes of food insecurity in Uganda are continuing

civil conflict, poverty, poor nutrition and health among young children, HIV/AIDS and natural disasters, including drought and floods. Poverty limits access to an adequate supply of food to maintain minimum nutritional requirements (WFP 2004). An estimated 38% of the Ugandan population (or 9.5 million people) have insufficient income to provide minimum family consumption requirements in addition to other non-food necessities (WFP, 2004).

Fig 1: Conceptual frame work: Determinants of nutrition status



According to the conceptual framework in Figure 1, major underlying determinants of nutritional status include dietary intake, health status /health care systems, food security, and socio-demographic characteristics. All these factors exist within a given environmental context. Feeding practices, dietary intake and health status, are the immediate determinants of nutritional status. Malnutrition increases vulnerability to infections, and infections aggravate malnutrition (Tomkins and Watson 1989). Inadequate dietary intake reduces the body's ability to fight infection and therefore contributes to increased incidence, severity and length of infections. Symptoms that accompany infections, such as loss of appetite, and fever, lead to reduced food intake, mal-absorption, nutrient loss, and altered metabolism, which lead to weight loss, growth faltering, and further weakening of the immune system.

Food and nutritional insecurity among the displaced population results from several factors, including limited production, limited access to land, limited availability of food commodities, lack of access to food, lack of income-earning opportunities and inadequate social services, including water, health services, sanitation and maternal-care practices (WFP, 2004). Food security is defined as “having the quantity, quality and diversity of food needed at all times to lead a healthy and productive life” (CARE, 1994). Basing on general income and food security parameters, WHO in its 1996 survey found that IDPs were substantially very badly off (WHO, 1996). Food insecurity is also defined as limited or uncertain availability of nutritionally adequate and safe foods or a limited or uncertain ability to acquire acceptable foods in socially acceptable ways. Food insecurity plays a big role in nutritional status (Mathesan *et al.*, 2002). Female-headed households, particularly those with many children, can have severe food insecurity. On a national scale, regardless of displacement status, female-headed households with many children comprise a highly vulnerable population group. Acute protein-energy malnutrition is a significant cause of morbidity and mortality among displaced populations especially women (Brennan *et al.*, 2001).

A study conducted by ISIS-WICCE covering the period between 1986 and 1999 found that the prolonged war in northern Uganda had not only forced the women to abandon their primary occupations, it had also considerably reduced the amount of property they owned, thus leaving them poorer than before. The study also found that many women had been de-linked from farming as their main source of livelihood. For example, while 31% of the women reported that their main occupation before the war was cultivation, fewer than 20% of them were still having cultivation as the main occupation and source of livelihood. The main cause for this shift in categorization was refuted to be the effect of war on accessibility to land. Access to land was limited to a 2 km radius around the camps and tall-growing cereals like sorghum, millet and maize were prohibited, as they were considered security risks" (OCHA, 2004). Before the war, Gulu, for example, had a mixed-farming system, which included the cultivation of crops and the rearing of animals. While cattle - and goat rearing was largely a men's/boys' affair, cultivation was predominantly in the hands of the women. In the course of the war, in the late 1980s an estimated 98% of cattle and other livestock were rustled. The loss of livestock had two main consequences for the population in Gulu. First, to all household members it entailed loss of

wealth invested in for years. Second, the ability to sell cattle and other livestock to meet family needs in education, shelter, clothing and medical bills was curtailed for most households. This had a significant impact on family livelihood, security and coping mechanisms (Isis-WICCE z 2000).

To the displaced women the loss of livestock meant increased responsibilities. Since animal rearing, the primary contributor to household welfare, was no longer feasible, the household economic burden fell squarely on the women's shoulders. Men's contribution in cultivation remained minimal and they resorted to heavy drinking. The war increased the proportion of unemployed women and housewives. Many disabled women suffered from permanent deformations, which made it difficult for them to take care of themselves. As a result many of them became totally dependent on relatives for food and shelter. Several of the women had been abandoned by their husbands and or lost their sources of income.

Thus the war not only resulted in massive displacement of the study population, especially women, but also considerably reduced the amount of property owned. It had a significant impact on family means of livelihood and coping mechanisms, such that in late 1996 severe malnutrition among the encamped population in Gulu district was as high as 70% before NGOs and agencies such as ACORD, World Vision and IRCR began distributing emergency food and seeds. This situation was further compounded by natural calamities such as the drought of 1997 (ISIS-WICCE, 2000).

2.3 Conflict and displacement in Northern Uganda

According to WFP, (2005) report, the conflict in northern Uganda caused the displacement of close to 2 million people, of whom approximately 1.7 million were receiving food assistance from the United Nations. UN Office also reported that, LRA attacks displaced people, more than 80% of whom were the ethnic Acholi from Gulu, Kitgum and Pader districts. It is estimated that since the beginning of the conflict, about 25,000 children were abducted; 7,500 were girls, with 1,000 having conceived during captivity (UNICEF, 2005).

In emergency contexts, there is often a sudden and massive reduction in food availability during

conflict, or reduction in accessibility to food by some sections of the community (displacement, reduced purchasing power, increased prices). The result is often acute and severe food insecurity, which may lead to high levels of malnutrition and mortality (Toole and Waldman, 1990). Emergency health workers/organisations have the responsibility to try and cure the malnourished, prevent malnutrition amongst the vulnerable and promote adequate distribution of food to allow a healthy existence (Toole and Waldman, 1990).

The United Nations World Food Programme reported that many IDP camps lacked adequate protection, sanitary facilities, health care, and were vulnerable to disease (WFP, 2005) it further stated that the lack of safe access to basic services such as water, health care, food, income-generating activities and shelter had resulted in substantial fatalities in northern Uganda. A study conducted by the Ministry of Health Uganda revealed that over 1,000 deaths occurred each week in northern Uganda, with the majority of deaths being attributed to malaria/fever and HIV/AIDS (MoH, 2005)

The MoH (2005) also observed that lack of proper sanitation also remained an acute problem in Kitgum and Pader districts. The number of persons per latrine in each district was 80 and 37 respectively. In addition, as farm animals lived in close proximity to IDP areas, their excreta were deposited throughout the camps (MoH, 2005). The MoH (2005) observed that the majority of deaths occurred outside a health facility, highlighting a serious deficiency regarding health care. It was also found that education remained a neglected sector, as 60% of schools in northern Uganda were displaced and only 2% of children aged three to five years had access to early childhood opportunities (UNICEF, 2005).

According to Oxfam (2002), the poor health among the displaced population has been aggravated by the congestion in camps and a breakdown of social structures. The conflict and displacement in northern Uganda had undermined community support systems, and there has been an increase in crime, alcohol and drug abuse since the 1990s. The conflict had also brought into existence “night commuters”, an estimated 30,000 children who regularly move from insecure rural areas to shelters or other locations within urban centres such as on verandas and in the streets to sleep at night (UNICEF, 2005). However, the numbers of night commuters had

subsided in subsequent months. While the numbers of night commuters had declined, children were still commuting in areas where LRA threats had subsided, resulting in many among the humanitarian community questioning the root causes of commuting. An assessment carried out in Gulu indicated that 25% of child night commuters trekked into towns every night owing to family issues rather than a specific fear of LRA abduction (UNOCHA, 2005b).

Refugees International (RI) reported that in the past years, the United Nations and non-governmental organizations had strengthened their responses to the crisis of displacement in northern Uganda, but their actions had not translated into an appreciable improvement in the conditions for IDPs (RI, 2004). It was further observed that, owing to insecurity and lack of staff, most humanitarian interventions tended to be infrequent and short-lived. A UN official was reported to have commented, that, "...the camps are substandard and ...the level of humanitarian assistance, except for food, is disgraceful." Access to water and sanitation was one of the biggest gaps identified (UNICEF, 2005). They also noted that in some camps people had access to only two litres of water per day, while 15 litres a day is considered acceptable; schools were overcrowded with the teacher-student ratio averaging 1:150; NGOs were not involved in camp management activities; services in most of the camps were sub-standard, and there were shortages of qualified health personnel. There had also been confirmed cholera outbreaks in seven camps in the north. Malaria was widespread, but mosquito nets were only provided to pregnant women. UNICEF, (2005) also reported a gap in the reproductive health services available to women, particularly survivors of rape. Emergency rape kits, which include emergency contraception and post-exposure prophylaxis to prevent the transmission of HIV/AIDS, were unavailable in most camps (UNICEF, 2005).

The IDPs mainly depended on non-governmental and humanitarian organisations for most of their non-food assistance. Several organisations were involved in the provision of health, water, and sanitation services (FEWS NET, 2005). Eighty-five percent of IDP households in northern Uganda receive food aid, whereas approximately 50% receive non-food items such as jerry cans, blankets, tools and seeds.

2.4 Impact of war/conflict on women's health

Women are typically the primary caretakers in families and their educational and social status will also determine to a great extent their own health as well as their families.' McGinn (2000) explained that displacement affects women's reproductive health status in the following ways: Fertility levels may go up or down in these populations; in the short term, they may be affected by the severity of the emergency; and in the long term, however, they may be affected by broader social and demographic factors. McGinn (2000) noted that, displacement and the presence of the military increase the spread of sexually transmitted infections (STIs) during conflicts; this affects host communities as well as refugees. While refugee women probably experience rape and other forms of sexual violence more often than settled women, it may not affect them in the same way because of the multiple traumas they suffer (McGinn, 2000).

A study of 3,000 pregnancies among women besieged in Sarajevo found that the number of live births decreased from 10,000 per year before the war to 2,000 per year during the war (Carballo, 1996). Contraceptive use during the siege decreased to about 5%, while the number of abortions increased until there were more than two abortions for every live birth. The data also documented increases in prenatal mortality (from 15.3% to 38.6% per 1,000 live births), low birth weight (from 5.3% to 12.8% per 1,000), and congenital abnormalities (from 0.37% to 3.0%). The authors ascribe the increases in morbidity and mortality to chronic stress, poor food intake, and reduced access to health services (Carballo, 1996). Jamieson (2000) reported similar results in Tanzania where a cross-sectional record review and survey to measure pregnancy outcomes over a five-month period among Burundian refugees living in a refugee camp in that country was conducted. Poor pregnancy outcomes were common: the foetal and neonatal mortality rates were 45.5% and 29.3% per 1,000 live births respectively. 22.4% of all live births were low birth weight. Jamieson (2000) noted that three factors significantly increased the risks of all three outcomes: high socio-economic status prior to becoming a refugee, first or second pregnancy, and three or more episodes of malaria during pregnancy. Neonatal and maternal deaths together accounted for 16% of all deaths in the refugee camp during the study period, which made reproductive health problems the third leading cause of death, after malaria and acute respiratory infections. Jamieson (2000) cautioned that their findings probably

underestimated the true extent of poor pregnancy outcomes, including deaths, because of difficulties in data collection.

Kalpieni and Oppong (1998) in their article described how the violence that leads to refugee flows also disrupts livelihoods and health services, creating conditions that promote the transmission of infectious disease, including outbreaks of dangerous new viruses. Kalpieni and Oppong (1990) also pointed out that refugee status is linked with reproductive health and mental health problems. During complex emergencies, rape, the use of sex as a survival strategy, host-refugee interactions, high rates of STIs, mother-to-child HIV transmission, and transfusion risks all contribute to the transmission of HIV Kalpien and Oppong (1990). At the same time, the silent nature of the epidemic, the stigma associated with the diagnosis, limited attention by aid organizations, and the lack of a functioning health care system, have all discouraged the problem from being addressed. Khaw (2000) argued that after the initial phase of emergency, HIV-prevention activities must be far more extensive than those offered as part of the Minimal Initial Services Package (MISP) in order to prevent an epidemic.

A major conclusion of a United Nations report was that in countries where nutrition improvement had lagged behind, economic growth was slow and social discrimination against women was common (UNICEF, 2005). Inadequate food intake, micro-nutrient-deficient diets, high energy expenditure and the stress and strain of menstruation, childbirth and breast-feeding, coupled with the responsibility to work the land, cook, build houses, and travel long, stony roads to gather wood and fetch water and care for several small children lead to weak, over-stressed women in poor health (Gillespie, 1997).

Intestinal parasites and chronic malaria cause even more complications. The functional consequences of chronic energy deficiency in women include heightened susceptibility to infection, reduced activity levels and lower productivity (Shetty and James, 1994). The cumulative effect of frequent, closely spaced pregnancies, negative energy balance, and micro-nutrient deficiencies can lead to a condition known as “maternal depletion syndrome” (Winskivist, *et al*; 1992).

2.5 Food distribution to IDP camps in Uganda

In emergency situations, food security is often severely threatened, causing increased risk of malnutrition, disease and death. Emergency health workers/organisations have the responsibility to try to cure the malnourished, prevent malnutrition among the vulnerable and promote adequate distribution of food to allow a healthy existence under the circumstances (Toole and Waldman, 1990). Under these conditions, general food distributions (GFDs) aim to bring the nutritional value of the diet, for the whole population, up to a “sufficient” level for survival. GFDs are often insufficient to meet the needs of all the members of the population, and/or distribution of food is frequently unfair, so that certain vulnerable groups (growing children, pregnant and lactating women, the elderly, and the handicapped) are at particular risk of becoming malnourished (Toole and Waldman, 1990).

The IDPs continue to experience precarious food security despite the presence of the emergency health workers/organizations. They are unable to produce much of their own food and mainly rely on food assistance provided by WFP (FEWS NET, 2005). The local food production significantly decreased in 2003 owing to high insecurity. However, improved security in the Lira and Teso sub-regions had enabled limited access to cultivatable land but had not resulted in large-scale food production owing to insufficient rains (FEWS NET, 2005). The current crop harvests are enabling households to replenish stocks and improve their food security. Although the majority of the camp populations were excluded from their land, some IDPs were able to supplement their income and diet as a result of petty business and small agricultural activities (FAO, 2005). The number of households with access to land had generally increased throughout the northern Uganda (FEWS NET, 2005).

FEWS NET (2005) observed mixed agricultural activities as communities and the IDPs with access to cultivable land in Lira were busy weeding and / or harvesting crops such as millet, beans, cassava, groundnuts, rice and green vegetables. Sowing of second-season crops, such as sorghum and cassava, was also ongoing during the month of August 2005 in some areas. Methods of food acquisition and income strategies had also improved, and the WFP planned to cut back rations to 50 % for able-bodied households in Gulu, Kitgum and Pader by December

2005 (WFP, 2005). Harvests were also increasing and supplies to markets were expected to improve market access for households (FEWS NET, 2005).

2.6 Health, Nutrition and the status of women in IDP camps

Overall mortality and malnutrition rates in IDP camps in Lira district had declined owing to improved services. Available results of malnutrition studies carried out in Apac and Lira districts of 2005, demonstrated that conditions were improving in IDP camps in northern Uganda (UNICEF, 2005). The results indicated improved nutritional levels among internally displaced persons in Lira district due to improved response and delivery of health, water and sanitary services through the concerted efforts of humanitarian organisations (UNICEF, 2005). Results for camps in Lira district showed a crude mortality rate (CMR) of 0.7/10,000/day, calculated retrospectively for three months prior to the survey (February to March 2005) (UNICEF, 2005). This is still very high as compared with most sub-Saharan African countries, which have a crude mortality rate of 0.4/10.000/day (Toole and Waldman, 1990).

Similarly, anthropometric analysis carried out on children revealed a global acute malnutrition (GAM) of 2.5 % {95% CI 1.4-3.6%} while severe acute malnutrition (SAM) was 0.2 % {95% CI 0.0 %-0. 5%}, both of which are low. This showed that conditions in Lira's IDP camps had improved. However, in both Apac and Lira districts, malaria and diarrhoea remain the leading causes of death among the age groups studied. Poor public health, and limited water and sanitation were cited as key factors (FEWS NET, 2005).

Nutrition and the status of women in IDP camps were defined as women's status relative to men in the households, communities, and nations in which they live (Smith *et al.*, 2003). Compared to their higher status counterparts, women with low status such as the IDW tend to have weaker control over household resource; tighter constraints on their time; more restricted information and health services; and poorer mental health, self-confidence, and self esteem. All of these contribute to the women's (IDW) nutritional status and the quality of care they receive.

According to Gillespie (1997), another period of nutritional stress is during adolescence and the reproductive years. Gillespie (1997) observed that additional energy is needed to support

adolescent growth, foetal growth during pregnancy, and milk production during lactation. Gillespie (1997) noted that adequate energy and micronutrient intake is critical at all stages in a woman's life, and recommended that for adolescents and women of reproductive age, improved energy intake, a diversified diet, and increased micro-nutrient intake through food fortification can help to improve their health and nutrition as well as birth outcomes.

2.7 Factors that determine maternal health and nutrition

2.7.1 Maternal education

The other factors impacting on women's health include illiteracy and lack of access to information. Numerous studies have consistently concluded that maternal education is a critical resource for maternal and child health, nutrition and survival (Armar-Klemesu *et al*, 1991). Women with some education tend to be better able to use healthcare facilities; interact freely with healthcare providers; comply with treatment recommendations; and keep their living environment clean (Engle *et al*, 1990)

2.7.2 Knowledge, attitudes and practices (KAP)

Nutrition education involves a combination of activities, including providing information, increasing people's knowledge of why specific foods and feeding practices are beneficial (FAO, 1995), (for example, exclusive breastfeeding up to six months, the introduction of complementary foods from six months onwards, feeding them separately from the family and other children so that they get their fair share, feeding actively by giving children preference in feeding etc.). Such information can influence people's attitudes and beliefs (for example low value placed on vegetables, high value placed on meat), helps them to develop personal skills (for example preparing an energy dense complementary food, learning how to feed a child actively) and motivate and support them to adopt healthy eating practices (for example forming mothers' support groups, providing information sessions for mothers on child feeding at monthly growth monitoring and promotion sessions, following up with mothers at home for individual support and counselling). Nutrition education also involves influencing public policy and promoting access to a variety of nutritious foods that are rich in macro and micronutrients.

Food and nutrition education plays a vital role in protecting and promoting household food security and nutrition. In situations of scarcity, it is essential that people know how best to make use of limited resources to acquire a variety of knowledge of what constitutes an appropriate diet, as well as the skills and motivation to practice good care and feeding practices. These are vital for households' survival, especially during times of crisis (FAO, 1983). Learning how to make optimal use of the foods available, including local foods and unfamiliar relief rations, and practicing healthy eating patterns are essential skills that can help households and individuals meet their nutritional needs.

Cultural beliefs and practices may also impose restrictions to foods eaten by IDW of reproductive age. Compared with European and other developed countries, animal product intakes among women are generally lower in developing countries and even lowest in IDP camps. For example, in the US, 60% of energy intake is from animal products, compared to a community study in Mexico where only 7% of total calories were from animal products among pregnant women (Allen *et al.*, 1997). In a corollary study in Egypt, pregnant women consumed only 17% of calories from animal products and 35% of calories from the traditional bread (Kirksey *et al.*, 1992). Figure 2 in *Appendix 2*, compares the most recent US Recommended Dietary Allowances (RDAs) for women of reproductive age (25-50), pregnant women and lactating women. As illustrated, the RDAs increase substantially during pregnancy and lactation. Fruits and vegetables are often only seasonally available or of limited variety in developing countries. For example, a national survey in Honduras found that among households in the poorest region, the average number of servings of vegetables per day per woman was only 1.2 (Rogers *et al.*, 1996). Currently developing-country diets of many women are unable to meet even the lower RDAs for women of reproductive age (Cuskelly, *et al.*, 1996). It even becomes more increasingly difficult to ensure adequate diets for women in displaced camps.

2.7.3 Pre-existing under nutrition among women

According to the UBOS, 2006 report, about 10% of non-pregnant, non-lactating women in Uganda had a BMI of less than 18.5%. However, there are no national data available as yet on the prevalence of overweight, low MUAC, obesity, and weight gain during pregnancy or energy intake. Most pregnant women make infrequent antenatal visits, which makes systematic follow

up difficult. Nevertheless, many pregnant mothers are unaware of their special nutrition requirements. They continue to carry a workload that requires considerable energy throughout pregnancy.

The three micronutrients of interest as far as women of reproductive age are concerned are iodine, iron, and vitamin A. These nutrients need to be addressed since much information about their contribution to human health and nutrition is well known today (Yip 1998, Zavaleta 1997, West *et al* 1997). However, concern is also growing in other micronutrients such as zinc, calcium, selenium, folate and others. Although the problem of micronutrient deficiencies is widespread and on the increase, the situation impacts more severely in the developing world and IDP camps in particular. Micronutrient malnutrition leads to high social and public costs, reduced work capacity in populations due to high rates of illness and disability and tragic loss of potential (FAO, 1997). It has been observed that poor dietary quality rather than quantity is the major determinant of inadequate micronutrient status among women in developing countries (Allen and Ahluwalia, 1997). Low-income populations, such as those found in IDP, camps consume most of their calories from low-cost staple foods and less from more expensive foods such as animal products, fruits, and vegetables, which are rich in micronutrients. A poor diet among women results in insufficient intake of several nutrients. In conjunction with infections and infestations that increase the demand for nutrients, deficiencies occur that impair women's health; this in turn affects the outcome of their pregnancies and the growth, development, and health of their breastfed infants (Winskvist *et al*, 1992).

CHAPTER THREE

MATERIALS AND METHODS

3.1 Study setting

The study was conducted in Erute IDP camp which is the biggest IDP camp, located in the south of Lira town in Lira District. The camp has a population of over 25,000 people mostly women (60%) and children (ACF 2003). The camp was divided into 3 sections, according to the counties the people were displaced from, i.e. Moroto (10,000), Erute, (15,000) and Dokolo (5,000). Erute IDP has had interventions such as tap water, mobile toilets, Food Aid. Clients are registered on arrival. There was a massive influx from Moroto and Dokolo at time of study. Sudden expansion limited access to services and registration. The camp was being reorganized at the time of this study.

3.2 Study design:

The study was cross-sectional and took place between May and July 2005. The descriptive study used quantitative methods to examine dietary intake and nutritional status of women receiving food aid from WFP.

3.3.1 Study population

The study population was women living in IDP camps - Lira District, Northern Uganda and receiving WFP aid.

3.3.2 Study subjects

The study subjects were non pregnant and non lactating women living in Erute IDP camp and receiving food aid from the WFP.

3.4 Sampling methods

3.4.1 Sample size establishment

The sample size was calculated using Epi-Info version 6.0 (*Epi-Info calculator*, CDC, Atlanta, GA, USA). The sample size was based on literature on the prevalence of malnutrition among women in Northern Uganda estimated at 17.7%, 95% CI level, at significance level of 5% and

power at 80% (UBOS 2004). The calculated sample size (n) was derived by the following proportions probability formula: $n = pqZ^2/d^2$

Where:

n- Sample size

Z- Parameter related to error risk, equals 1.96 or 2 for an error risk of 5%.

P = Expected prevalence of malnutrition in the population, expressed as a fraction of 1.

d- Degree of accuracy, expressed as a fraction of 1.

q = 1-p, expected proportion of women not malnourished, expressed as a fraction of 1.

If ;

$$p = 17.7\%$$

$$q = 82.3\%$$

$$Z = 1.96$$

$$d = 5\%$$

By substitution;

$$n = \frac{Z^2 pq}{d^2} = \frac{(1.96 \times 1.96 \times 0.117 \times 0.823)}{(0.05 \times 0.05)} = 224_{subjects}$$

(n, therefore = 224 women).

A minimum sample size of 224 women was generated.

3.4.2 Sampling technique

All three sections of Erute IDP camp were selected. A proportionate sample of study subjects was calculated for each section. Study women within each section were selected by simple random sampling using lists of names drawn by food distribution centres in each section.

3.5 Data collection methods and instruments

A pre-tested structured questionnaire was used to collect data and information on socio-demographic characteristics (education, economic status ,age and religion), health status and the availability of and access to health services (*Appendix 1*). It also involved assessing various determinants of health, risk factors, and social indicators (employment / income, housing,

education). Data on dietary intake was collected by dietary recall methods.

The non-pregnant state among study women was determined by asking when they had last had their menstrual period. Those who had missed their period for the last one-month and all those whose normal periods were more than one month overdue were excluded from the study (as recommended by Dr. Nakiwoga Alice Mwanga (Mrs), Medical officer Mulago Hospital, 2004, personal communication). Those suspected to be pregnant were excluded because their weight would not reflect their true nutritional status (Mwanga, 2004, personal communication).

3.6 Measurements

3.6.1 Determination of nutritional status of women

Anthropometric measurements

The nutritional status of the women was assessed using both Body Mass Index (BMI) and mid-upper arm circumference (MUAC) as indicators of energy balance in Adults. Calibrated equipment and standardized techniques (Ferro-Luzzi, *et al.*, 1996) were used to take a number of anthropometric (body) measurements on the women. The measurements were taken with the women wearing light clothing and no shoes to minimize error. Each measurement was taken by the same measurer to eliminate inter-examiner error. Standing height was recorded to the nearest 0.1 cm using Short's Height Measuring Board (Short Productions, Woonsocket, RI). Weight was recorded using a 100 kg digital scale (Salter Weight-Tronix Ltd., West Bromwich, United Kingdom). A non-stretch insertion tape was used to measure MUAC on the left arm of each woman. Anthropometric data was then entered into the EPI-INFO 2002 nutritional anthropometry computer software program to aid in determining the body mass index. Body mass index (BMI) was calculated as $\text{weight} / \text{height}^2 (\text{kg}/\text{m}^2)$.

3.6.2 Determination of dietary intake

A food-frequency questionnaire (*Appendix II*) was used to determine dietary intake. A seven-day food-frequency questionnaire based on the one used by Uganda Demographic and Healthy Survey in 2000/01 (UBOS, 2001) was employed to capture frequency of consumption of foods containing the nutrients of interest to this study. Average daily nutrient intakes and major food

sources of macro- and micronutrients were calculated using the Nutri-Serve Software (FAO, 1990). The predicted prevalence of inadequate intakes was calculated for selected nutrients using the probability approach and the estimated average requirements based on the recent joint Canada/US dietary reference intake series of reports (World Bank 2000). Food intake data were also collected from the study women using two interactive 24-hour recalls as explained by Gibson and Ferguson (1999). Recall days were selected to ensure a representative sample of days of the week. Women that were involved in the study were instructed not to change their dietary intake over the recall days and were monitored for this.

3.6.3 Determination of adult equivalent unit measure of calories

Adult equivalent unit measures help determine as to whether the household had enough calories available to meet the caloric requirements of household members. The number of “adult equivalents” in the household was determined by scaling the requirements of each individual in the household to those of a reference adult, based on age, sex, and an assumption of a moderate activity level (FAO/WHO/UNU, 1985). The 3,000 kilocalories per day requirement of the reference adult were based on the estimated daily requirements.

3.7 Data Analysis

After the average daily nutrient intakes data was entered into the Nutri-Serve Programme the ratio of available calories to recommended calories was calculated. IDWs with less than 80% value ($< 2400\text{kcal}$) were considered food- insecure while those with more than or equal to 80% ($\geq 2400\text{kcal}$) were deemed to be food- secure (Maxwell *et al.*: 1992). After anthropometric data were entered into the EPI-INFO Programme, the BMI was determined and IDWs with less than 18.5 kg/m^2 were considered underweight while those between 18.5 kg/m^2 and 24.9 kg/m^2 were considered of normal weight (Shetty *et al.*; 1994). Those with 25.0 kg/m^2 to 29.9 kg/m^2 were considered overweight and those with 30.0 kg/m^2 and above were considered obese. Data analysis was done using SPSS (Statistical Package for the Social Sciences) version 12. Cross tabulations were performed on some selected variables (bivariate analysis). Statistical significance was determined using Pearson’s chi square (p-values) and correlation (r) tests. The 95% confidence interval was used in significance analysis. Chi-square tests were performed to relate characteristics of respondents with general nutritional status. Binary logistic regression

was used to determine risk factors associated with malnutrition among the studied women.

3.8 Ethical Considerations

The District Director of Health services (DDHS) Lira district granted me the permission to conduct this survey. Details of the study were explained to the local leaders of the study area and, lastly informed consent was sought from the respondents particularly the women who gave their verbal consent before the interview was carried out.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Socio-demographic characteristics of IDW

Age of IDW

The study investigated a total of 224 non pregnant, non lactating women of reproductive age (15-49yrs) living in Erute IDP and receiving food aid. The socio-demographic characteristics of study women are listed in Table 1. It was established that (Table 1) most (60%) of IDW were young (25 years or lower). About a quarter (24.3%) did not attend school at all while a relatively low proportion (16.4 %) advanced beyond secondary school level despite the fact that there are primary, secondary and tertiary institutions within and around the camp.

Education level of IDW

The low educational attainment level may be attributed to low levels of income of women in IDP camps as reported by UBOS (2003). It has been well documented that in the camp setting, women are discriminated against, especially in terms of education. Currie *et al.* (2000) noted that most camp communities in sub Saharan Africa prefer marrying off their daughters early in anticipation of economic gain from dowry rather than retaining them in school. Indeed, during this study it was observed that there was a parent who removed from school and gave away her 15 year old daughter for marriage for a dowry of two pigs.

Marital status of IDW

The findings from this study indicate that the majority of the IDW (38.8%) were single while 23.7% were widows (Table I). Some of the women (23.3%) were in polygamous marriages while a few (14.2%) were monogamously married. This is too low compared to about (49%) female who were formally married as reported by (UDHS, 2001). These findings are not surprising, given that most of the IDW are victims of war and many have lost their husbands. As a result of these wars, very few able-bodied men have been left alive, which also explains the high levels of polygamous unions. The anticipated effect of high prevalence of such unions is an increase in the size of the family, which other studies have shown to be negatively related to nutritional status. However, in this study, marital status did not significantly affect the nutritional status of IDW in

Erute camp.

Source of income;

Means that someone has some source of income from petty business, casual labour or from her farm or livestock where she can sell some proceeds and get some income. Results from the study (Table 1) show that out of the 224 respondents interviewed, 31.5% had no source of income while 68.5% had some form of income. The difference could be attributed to the fact that the IDP members do a lot of casual labour to help empower themselves economically so as to improve their socio-economic welfare (SCF, 2007). Of the IDW who had no source of income, 11.5% had good nutritional status, while a bigger percentage (20%) had poor nutritional status. On the other hand, a bigger percentage of the IDW (38.5%) who have some source of income had good nutritional status compared to those who had poor nutritional status (30%).

Household size

The results of the study are presented in Table1. It was established that the majority of households (31%) had more than nine household members, and a minority (19.2%) had less than three household members. The figure of 9 members in a household is much higher than that quoted for the northern region, which was estimated to be on average about five persons per household (UBOS, 2006). A probable explanation for this high figure could be because these peoples' reproductive rate was found during the study to be very high, on average, each woman had seven children. Respondents reported that they don't practice family planning because this is considered a taboo. Secondly, there were large numbers of dependants and orphans due to the war.

The other possible explanation of the large household size could be the low levels of education, which have been associated with large household sizes (Baraka, 2005). In a study by Women's Commission for Refugee Women and Children (2005) district education officers (DEO's) from Kitgum and Lira, said that girls enter school older than boys and leave earlier. They explained that poverty: insecurity, traditional roles, early marriage and lack of female teachers contribute to this discrepancy.

Poverty, coupled with traditional marriage practices of dowries given to the girl's parents, leads to girls being married off early, at age 12 or 13; at that point, the girl no longer attends school. Even if a teacher intervenes, the parents will often defend the decision to marry the girl off; there is a sense of, "Why spend money on a girl when we are in such poverty and the family can benefit from the dowry from her marriage?" Some parents believe that a girl who is educated might not produce many children. Hence, the dropout rate for girls in secondary which ranges from age 13 to 14 years is very high. Girls are expected to engage in small business to assist with income for the family.

Table 1: Socio-demographic characteristics of study women aged 15-49yrs in Erute IDP camp (n = 224).

Characteristic	Number	%	Cumulative %
Age (years)			
< 20	26	11.6	11.6
20 - 25	109	48.6	60.2
26 - 30	39	17.5	77.7
31- 35	24	10.7	88.4
36 - 40	14	6.3	94.7
41 - 45	7	3.1	97.8
46 - 49	5	2.2	100
Education level			
Not attended	54.	24.3	24.3
Primary	49	22.0	46.3
Secondary	84	37.4	83.7
Above secondary (tertiary)	37	16.3	100
Marital status			
Married (couple)	32	14.2	14.2
Married (polygamous)	52	23.3	37.5
Single	87	38.8	76.3
Widowed	53	23.7	100
Source of Income			
Had source of income	153	68.5	68.5
No source of income	71	31.5	100
Household size			
≤ 2	43	19.2	19.2
3 - 5	54	24.2	43.4
6 - 8	57	25.6	69.0
> 9	70	31.0	100

4.2 Nutritional status of IDW in Erute camp

The nutritional status of the women was assessed using both Body Mass Index (BMI) and mid-upper arm circumference (MUAC) as indicators of energy balance in Adults.

4.2.1 Nutritional status of IDW in Erute camp by BMI

The nutritional status of IDW was categorized into poor and good nutritional status using BMI and the results are presented in Table 2.

Table 2: BMI of IDW receiving humanitarian Aid in Erute camp

Category	BMI (kg/m ²)	No. of IDW	%
Underweight	<18.5	109	48.7
Normal	18.5 -24.9	107	47.8
Overweight	25-29.9	8	3.5
Obese	>30	2	1.0
Total		224	100

It was established that out of the 224 IDWs 48.7% were underweight with a mean BMI of 16.1 whereas 47.8% were of normal weight. Results further show that 3.5% of the women interviewed were overweight while 1.0 % was obese. According to BMI findings, majority of women were underweight. This finding is higher than the national demographic data of 2006, which stated that about 10% of non-pregnant women in Uganda have a BMI below 18.5kg/m². The results were also comparable to those observed in sub-Saharan Africa where the prevalence of under-nutrition (BMI < 18.5) in adult populations of the countries sampled ranged between 7.6% in Tanzania to 44.6% in Ghana for women of reproductive age (Helpage, 2004).

4.2.2 Distribution of Nutritional status of women (MUAC) by age group

Overall, the mean MUAC among studied women was 25.5 ± 6.3 cm (Table 3). Results shown

in Table 3 indicated that younger women had a lower mean MUAC compared to older women. This could be due to poor feeding practices exercised by the younger women. Because of short birth intervals, they had very many young children (on average seven), and most women were found to surrender their food to the children and their male partners when the food was insufficient. Also because of the extreme conditions of poverty under which they were living, they consumed low-energy and nutrient dense foods. The older women on the other hand had grown up children who were contributing some food and income to the family. The poor nutritional status may also be attributed to low levels of income of women of IDP camps as reported by UBOS (2006).

Table 3: Distribution of Nutritional status of women (MUAC, BMI) by age group

	Age < 25 years	Age ≥ 25	<i>P</i>
MUAC, cm (Mean SD)	22.2 (2.8)	27.6 (4.2)	0.009
BMI (kg/m ²)	20.6 (3.2)	25.8 (4.5)	0.006

Overall p from MANOVA including both anthropometric results= 0.0000

4.3 Dietary Intake of study women

Table 4; shows the nutrient intake among studied women. The results of the study are presented in Table 4. A poor diet among IDWs, resulted in insufficient intake of several nutrients. The energy intake was inadequate; on average only 60% of reference value was taken (Table 4). Protein and fat intake was also low as only 76% of the reference value was taken. Among the micro nutrients, Vitamin A and folic acid intake was adequate as the rich sources of these nutrients mainly mangoes and dark green vegetables were in season. In addition, food aid from WFP consisted of corn soy blend and vegetable oil fortified with Vitamin A.

The high under-nutrition prevalence in IDW could mainly be attributed to the fact that, there is inadequate food intake due to insufficient food available at the household level, improper feeding practices or both. Also IDW in Erute camp consumed most of their calories from low cost staple foods and less from more expensive foods such as animal products (Table 4). This study is in agreement with that of (Winkvist, 1992). Which says that low-income populations as those in IDP camps consume most of their calories from low cost staple foods and less from more

expensive foods such as animal products, fruits, and vegetables, which are rich in micronutrients. The low caloric intake of IDW could be due to several factors, including limited production, limited access to land, limited availability of food commodities, lack of income-earning opportunities and inadequate social services, including water, health services, sanitation and maternal-care practices (WFP, 2004).

Table 4: Energy intake among study women

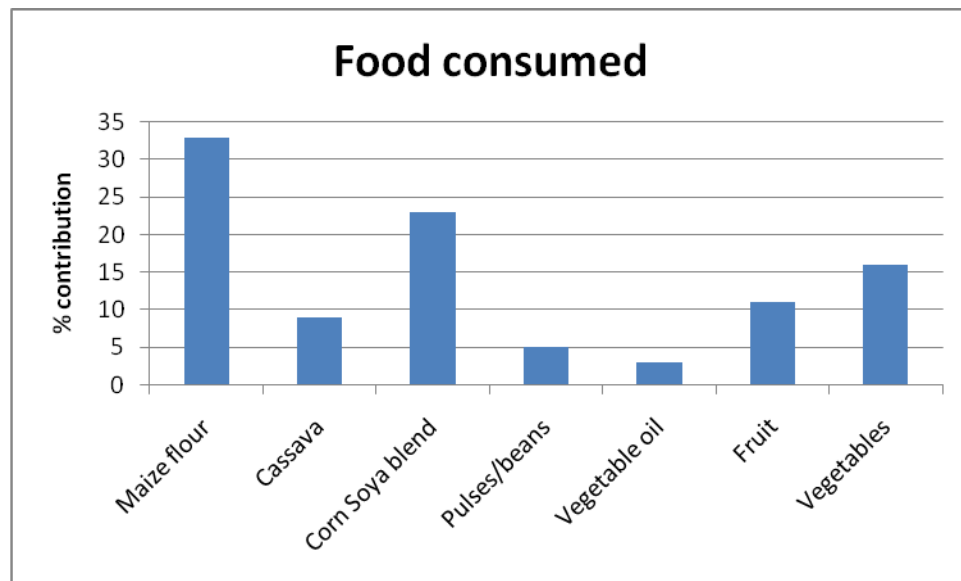
Nutrient	Mean Intake (SD)	Reference value	% of reference value	% contribution to total energy intake
Energy (kcal)	1, 505 (230)	2,500	60.2	
Protein (g)	24.3 (12.4)	162	15	13.1 (3.0)
Fat (g)	31 (24.5)	103.3	30	25.0 (9.1)
Carbohydrate (g)	354 (92.8)	472	75	69.5 (9.2)
Dietary fibre (g)	38.8 (12.1)	30	129.3	
Vitamin A (µg)	1,156 (987)	800	144.5	
Folic acid (µg)	325 (154)	600	54.2	
Vitamin C (mg)	45 (61.9)	55	52.0	
Calcium (mg)	424 (361)	800	81.8	
Iron (mg)	15.1 (6.2)	30	50.3	
Zinc (mg)	8.2 (4.6)	14	58.6	

4.3.1 Frequency of Food consumption among the studied women

The main foods consumed by the IDW were found to be, maize flour, beans, and vegetables (Figure 2). Corn soya blend and vegetable fat were given by WFP on a monthly basis. A variety of wild vegetables was often gathered from the neighbouring bushes and used by the women to supplement their family diets. Mango fruit was also in season and abundant during the study period. Figure 2 shows the main food sources and their relative contribution to energy intake by study women.

Figure 2

**Food consumed by study women and % contribution to energy
Intake.**



4.4 Factors affecting nutritional status

Findings from the study indicated that there was a significant relationship between the educational level of the respondents and the general nutritional status. Respondents who attained a higher level of education beyond secondary level had a higher probability of having good nutritional status than those who never attended school at all. It was observed that 14.5% of the respondents who had attained education level beyond secondary had good nutritional status compared to 1.9% in the same category who had poor nutritional status. On the other hand, it can also be noted from Table 5, that more respondents (17.1%) who did not attend school at all had poor nutritional status while a low percentage of these respondents (7.2%) had good nutritional status. This difference may be attributed to the fact that women of low educational level are less empowered to access economic resources (Bairagi, *et al* 1980), which is reflected in their poor general nutritional status. Other researchers have documented similar results showing that schooling is associated with improved nutrition only among households that have access to a minimum level of resources (Bairagi, 1980; Reed, Habicht, and Niamego, 1996).

Other studies have also concluded that women education is a critical resource for maternal and child health, nutrition and survival (Armar-Klemesu *et al.*, 1991). Educated mothers tend to be better able to use healthcare facilities; interact freely with healthcare providers; comply with treatment recommendations; and keep their living environment clean (Engle *et al.*, 1990)

Table 5: Socio-demographic characteristics of internally displaced women (IDW) receiving humanitarian AID by nutritional status

Characteristic	% Respondents with good nutritional status	% Respondents with poor nutritional status	% Total	p value
Educational level of house hold head				
Not attended school	7.2	17.1	24.3	0.01
Primary complete	5.7	16.2	21.9	
Secondary complete	29	14.5	37.4	
Above secondary	14.5	1.9	16.4	
Total	50.3	49.7	100	
Age				
Mean age in (yrs)	42	20	31	0.001
Employment Status				
Unemployed	11.5	20.0	31.5	0.020
Employed	38.5	30.0	68.5	
Total	50.0	50.0	100.0	
Marital Status				
Widowed	7.1	16.6	23.7	
Polygamous	5.7	17.6	23.3	
Married				
Single	23.9	14.9	38.8	
Monogamous	13.7	0.5	14.2	
Married				
Total	50.4	49.6	100.0	
Household size				
0 up to 2	12.7	6.5	19.2	0.021
3 to 5	12.5	11.7	24.2	
6 to 8	12.1	13.6	25.6	
9 plus	11.4	19.6	31.0	
Total	48.7	51.4	100.0	

4.4.1 Age

Results from this study showed that there was a significant difference in age between women who had good nutritional status and those who had poor nutritional status ($p < 0.05$). Good nutritional status IDW tended to be much older, with a mean age of 42 years, than poor nutritional status IDW, whose average age was 20 years. Age has been used in various agricultural production studies to proxy for experience in farming. Farmers who have more

experience in agricultural production tend to have higher yields, and this is attributable to the great managerial skills gained over time. Kmenta (1971) carried out a study on age in agricultural production and observed that greater experience in farming is directly linked to higher agricultural production, which is also a key determinant of food security and nutrition in sub-Saharan Africa. Since some of the respondents had access to farms outside the camp, their experience in farming could have contributed to improved nutritional status. However, some researchers argue that age cannot be used as a proxy for experience in farming because a farmer can be old but may not necessarily have the required managerial aptitude in view of the fact he or she may have just taken up farming (Abdulai and Huffman, 2000).

4.4.2 Marital status of IDW

The findings from the study indicate that the majority of the IDW (38.8%) were not married while 23.7% were widows (Table 5). Some of the women (23.3%) were in polygamous marriages while a few (14.2%) were monogamously married. These findings are not surprising, given that most of the IDW are victims of war and many have lost their husbands. As a result of these wars, very few able-bodied men have been left alive, which also explains the high levels of polygamous unions. The anticipated effect of high prevalence of such unions is an increase in the size of the family, which other studies have shown to be negatively related to food and nutrition security. However, in this study, marital status did not significantly affect the nutritional status of IDW in Erute camp.

4.4.4 Household size

The results of household sizes of IDW of reproductive age 15-49 years in Erute IDP camp are presented in Table 5. Majority of households (31%) had more than nine household members, and a minority (19.2%) had less than three household members. The figure of nine members in a household is much higher than that quoted for the northern region, which was estimated to be on average about five persons per household (UBOS, 2006). A probable explanation for this high figure could be because these peoples' reproductive rate was found during the study to be very high on average, each woman has seven children. Respondents reported that they don't practice family planning because this is considered a taboo.

The other possible explanation could be the low levels of education, which have been associated

with large household sizes (Baraka, 2005). In a study by Women's Commission for Refugee Women and Children (2005) District education officers (DEO's) from Kitgum and Lira, as well as NGO representatives, said that girls enter school older than boys and leave earlier. They explained that poverty, insecurity, traditional roles, early marriage and lack of female teachers contribute to this discrepancy. When families in northern Uganda can afford to send a child to school, they often choose their sons; parents may feel that given the traditional role of women marrying, tending crops and raising children, girls do not need education as much as their male siblings.

Parents in situations of insecurity including those in camps also know the risks that their daughters take in going to and from school: gender-based violence and rape. There are reports of girls who do better than boys in school being bullied by the latter. Given this, parents may want to keep their girls home to protect them. Poverty, coupled with traditional marriage practices of dowries given to the girl's parents, leads to girls being married off early, at age 12 or 13; at that point, the girl no longer attends school. Even if a teacher intervenes, the parents will often defend the decision to marry the girl off; there is a sense of, "Why spend money on a girl when we are in such poverty and the family can benefit from the dowry from her marriage?" Some parents believe that a girl who is educated might not produce many children. Hence, the dropout rate for girls in secondary which ranges from age 13 to 14 years is very high. Girls are expected to engage in small business to assist with income for the family.

The study further revealed that there was a significant positive association between household size and good nutritional status ($r = 0.207$). Implying that households that had fewer individuals were more likely to have good nutritional status. Earlier studies on food security have also observed this trend. For example, Ruel *et al.* (1999) hypothesized that greater household size is likely to have a large negative impact on calorie availability, with the effect initially greater in rural than in urban areas.

4.4.5 Previous nutrition Knowledge

Findings from the study showed that IDW who had better knowledge of the best methods to attain good nutrition, that is through consumption of sufficient and various types of foods,

significantly had better nutritional status ($P < 0.05$) compared to their counterparts as shown in Table 6. The majority of the IDW (52.0%) did not know of the existence of the link between dietary intake and nutritional disorders (Table 6). Worse still, a fairly large proportion of IDW (28.9%) refuted that dietary intake and nutritional disorders were related. Only a small fraction of IDW (19.2%) was aware of the important connection between these two variables. This observation demonstrates a very serious gap in knowledge about key nutritional facts by IDW in Erute IDP camp, which the managers of this camp have failed to see the need in the lives of IDW. Furthermore, results show that out of the (50%) of IDW who were underweight, (31%) did not discern the relationship between dietary intake and nutritional disorders, in contrast with (5.2%) of those who were aware of this relationship.

Various studies have shown clearly the link between knowledge of nutrition and nutritional status, such as those reported by the Cebu and team (1991), Ruel *et al* (1992), and Ruel *et al* (1999). These authors demonstrated that knowledge through nutrition education could improve nutritional status through improved dietary practices. Thus, well-targeted nutrition education programmes designed to improve specific care-giving practices, better dietary plans, hygiene and use of health services, could in the short term help mothers make better use of their scarce resources and protect their own and possibly their children's health and nutrition. Nutrition knowledge among study women was assessed and results were as illustrated in table 6.

Table 6: Nutrition Knowledge by Nutrition Status

Variable		% respondents with poor nutritional status	% respondents with good nutritional status	Total %	p
Exposed to nutritional	Yes	19	29	48	0.004

education					
	No	31	21	52	
	Total	50	50	100	
	I don't really know	15.4	9.1	245	
	Total	50	50	100	
Best method for acquiring good nutrition	Eat sufficient and varying types of food	8	14	22	0.024
	Only eating of foods rich in vitamins	9.3	13.7	23	
	Selecting foods that are rich in protein	15.4	11.5	26.9	
	Taking tablets as supplements	17.2	10.8	28	
	Total	50	50	100	
Knowledge about relationship between diet and disorders	Yes	5.2	11.1	19.2	0.013
	No	13.9	17.7	28.9	
	Do not know	30.9	21	51.9	
	Total	50	50	100	
Knowledge about relationship between health issues and nutritional status.	Food that we eat	9.3	16.6	26	0.011
	Water that we drink	10.3	12.8	23.1	
	Do not know	30.4	20.5	50.9	
	Total	50	49.9	100	
Definition of malnutrition	Poor feeding patterns	8.7	13.8	22.5	0.022
	Eating only beans	8	13.7	21.7	
	Improper child-spacing	14.2	15.2	29.4	
	Do not know	12.7	13.7	26.4	
	Total	43.6	56.4	100	

4.5 Risk factors associated with malnutrition in Erute IDP Camp

In this section, underweight was taken to represent malnutrition of IDW living in Erute IDP camp. Thus, the risk factors associated with underweight of IDW were considered to be; frequencies of meals, sufficient supply of food; access to health services and low caloric intake

per day as it leads to diminished energy available. The results of the study (Table 7) indicated that frequency of meals in the households had a significant effect on malnutrition of IDW. Those women who had less frequent meals per day had a greater chance of being underweight. A probable reason for this trend is the diminished calories from fewer meals taken by these individuals. Poverty as a result of lack of economic resources could be one of the major causes of this shortage. Other studies, which are in agreement with the current findings, include those reported by Ruel and Garrett (1999) who noted that a household's access to food depends on whether the household has access to economic resources or has sufficient land and other resources to grow its own food. In addition, it can also receive assistance from formal programmes or informal networks to compensate for any shortfall. Location of meals and incidence of snacking were reported to be highly correlated with increased BMI due to increased caloric intake.

This study indicated that there was a significant positive relationship between nutritional status and availability of a sufficient supply of food. It was observed from the study that IDW from households that had enough food throughout the year had better chances of having a better nutritional status. If a household has an adequate supply of food throughout the year, it implies that it has enough income to cater for its food requirements or has the necessary capacity in the form of land and other inputs to produce enough food for itself. Similar findings were reported by Alderman and Higgins (1992).

Access to health services was observed to have a significant relationship with nutritional status. This implies that households that had access to health services were more likely to have a better nutritional status. Access in the context of this study means proximity to affordable and quality health services. Ruel and Garrett (1999) also observed that in addition to the hygienic condition of the household, nutritional status could also be affected by the ease of access to and quality of health care, which is a big problem in the camps.

Table 7: Risk factors associated with malnutrition in Erute IDP camp

Parameter	B	S.E.	Sig.
Frequency of meals	-2.354	.566	.000

Food adequacy throughout the year	-1.972	.558	.000
Access to health services	-2.151	.595	.000
Number of children alive	.046	.082	.575
Membership of social organisation	-1.466	.520	.005
Knowledge about nutrition	-1.218	.501	.015
Gender of household head	-.720	.474	.128
Annual household expenditure	-.150	.072	.037
Constant	5.870	1.276	

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusions

The socio-demographic factors studied; - education, frequency of meals, membership of social organisations, and availability of a sufficient supply of food, caloric intake level and access to health services were significantly positively associated with malnutrition. Low educational levels among the IDW greatly undermined the welfare of the IDW since it is the key cause of poor nutritional status. Poverty as a result of lack of economic resources was also found to be one of the major causes of this shortage. The majority of younger IDW's (age 20 and below) were

found to have poor nutritional status, as compared to the older IDW's of average age 42 yrs and above.

Another principal contributor to poor nutritional status was low incomes. Large family sizes were found to be a major contributor to poor nutritional status among IDWs. Overall, the feeding programme has not had the desired impact and is not sustainable because it tends to create the dependency syndrome, which may worsen the situation. The best way to tackle health and food crises in these camps would be to educate the IDPs and provide them with a source of income. In this respect, the following measures should be undertaken:

5.2 Recommendations

The feeding programme should target the younger IDW's more since they are the ones with poor nutritional status. Furthermore, income-generating activities such as cottage industries, which are not capital-intensive, should be introduced. This will provide them with a source of income and also help improve their nutritional status

Food based approaches (FBAs), which include food production, dietary diversification and food fortification, are sustainable strategies for improving the micronutrient status of the IDW population. It is therefore recommended that adult education programmes be introduced in these camps using the various methods mentioned earlier in addition to frequently airing nutrition-based information over the radio.

The government should ensure that women and children have equal right to adequate housing and land, and that the efforts undertaken to relocate the IDPs are consistent with international human rights standards. Increasing access to and consumption of a variety of micronutrient rich foods not only has a positive effect on micronutrient status but also contributes to improved nutrition in general.

Ways of introducing micro-finance institutions in these areas should be looked into, as this will provide grants to finance small businesses, which can act as a source of income for this people and hence help improve their nutritional status. In addition to nutritional education, family

planning education should also be extended to these areas, as this will go a long way in helping reduce the number of children in the household's hence improved nutritional status of the households. Special attention must also be paid to vulnerable groups of women in the camp such as the: widows, women-headed households, and disabled and aged women in order to improve on their nutritional status.

REFERENCES

Abdulai,A., Huffman ,W. (2000). 'Structural Adjustment and Economic Efficiency of Rice Farmers in Northern Ghana'. Economic Development and Cultural Change, pages 504-519.

ACC/SCN. (1993) 'Addressing Micronutrient Malnutrition' ACC/SCN NEWS No. 9., page 2.

ACF (2003) Action against hunger Children Under Five at Risk of Mortality in Northern Uganda: ACF highlights the growing malnutrition crisis threatening children in northern Uganda.

African Nutrition Chart book (ANC) (2000-2001) 'Nutrition of Young Children and Mothers in Uganda' The findings from UDHS, pp. 2,30,43,72

Ajibefun, I., Battersse, G. and Ryohei, K. (1996). 'Technical Inefficiency and Technological Change in the Japanese Rice Industry: A Stochastic Frontier Analysis'. CEPA Working Papers, No 9/96, University of New England

Alderman,H. and Higgins, P. (1992) 'Food and Nutritional Adequacy in Ghana'. Cornell Food and Nutrition Policy Program Working Paper No. 27. Cornell University
Food and Nutrition Policy Program, Ithaca, NY

Allen, L. and Ahluwalia ,N. (1997). Improving Iron Status through Diet. John Snow, Inc. OMNI Project.

Angeles-Agdeppa, W., Schultink, S., Sastroamidjojo ,R. Gross and Karyadi ,D. (1997)

‘Weekly Micro-nutrient Supplementation to build iron stores in female Indonesian adolescents’. *American Journal of Clinical Nutrition* (66): 177-83.

Armar-Klemesu ,M. (1991). A Profile of Food Security in Rwanda, An analysis based on the results of the Household Living Conditions Survey, Kigali, Ministry of Finance and Economic Planning, Republic of Rwanda

Azerbaijan, (2000) – Multiple Indicator Cluster Survey, UNICEF.

Bairagi ,R. (1980). ‘Is income the only constraint on child nutrition in rural Bangladesh?’ *Bulletin of the World Health Organisation* 58, 767-772

Baraka ,W. S. (2005). Factors Associated with Adoption of Family Planning Control Methods in Mbarara District. MSc Thesis Submitted to the Faculty of Social Sciences, Department of Social Studies, Makerere University.

Baqui, A. H., Arifeen, S.E., Amin, S. and Black, R.E. (1994) .‘Levels and Correlates of Maternal Nutritional Status in Urban Bangladesh’. *European Journal of Clinical Nutrition*; 48(5): 349-57.

Behrman, J., Deolalikar, A. (1988). ‘Health and Nutrition’. In *Handbook of Development Economics*, Vol. 1, ed. H. Chenery and T. N. Srinivasan, pages.630–711. North-Holland, NY.

Bouis, H., Haddad, L.(1992). ‘Are estimates of calorie-income elasticities too high?’ *Journal of Development Economics*, 39 (2), 333-364

Brennan (2001) High fertility among Indochinese refugees, *Public Health Report*, March-April, 104(2):143-50

Buce, C. (2003). Anthropometric Indicators Measurement Guide. Food and Nutrition Technical Assistance (FANTA) Project. Academy for Educational Development. Washington D.C.

Bouis, H. (1997). Gender-Aware Country Economic Reports: Working Paper No 2, Uganda, Prepared for DAC/WID Task Force on Programme Aid and Other Forms of Economic Policy-Related Assistance. OECD, Paris

Bunch, S. and Murphy, S.P. (1997). User's Guide to the Operation of the World Food Dietary Assessment System, Version 2.0. Berkeley: Office of Technology Licensing, University of California, and Berkeley.

Canarajah ,R. S., Blackden ,C. M. (2003). ‘Gender and Growth in Africa: Evidence and Issues’. World Bank, UNECA Expert Meeting on Poor Growth, Kampala, Uganda.

Cebu Study Team (1991). ‘Underlying and Proximate Determinants of Child Health: The Cebu Longitudinal Health and Nutrition Study’. *American Journal of Epidemiology*, 133 (2), 185-201.

Carballo ,M. (1996) ‘Health in Countries Torn by Conflict: Lessons from Sarajevo’. *Lancet* 348:872–74.

Christian, P (1997). ‘Nutritional health of war-affected populations: what do we Know?’ *International Family Planning Perspectives* 26: 174-80.

Christian, P (1998) ‘Vitamin A or beta-carotene supplementation reduces but does not eliminate maternal night blindness in Nepal’. *Journal of Nutrition* 128(9): 1458-1463.

CSOPNU(2004a) (Civil Society Organisations for Peace in Northern Uganda); ‘Land Matters in Displacement’.

CSOPNU (2004 b) (Civil Society Organisations for Peace in Northern Uganda) ‘Nowhere to Hide’.

Collins, S., Duffield, A. and Myatt, M. (2000). Assessment of Nutritional Status in Emergency Affected Populations; UN ACC/SCN Geneva

Currie, K., Spink, J. and Rajendran, M. (2000). Well-written Health Information: A Guide. Department of Human Services. Melbourne.

Cuskelly, G., McNulty, H. and Scott, J. (1996) 'Effect of Increasing Dietary Folate on Red Cell Folate: Implications for Prevention of Neural Tube Defects'. *The Lancet* 347: 657-9.

Cuskelly, G. (1996). Nutritional status and mortality of refugee and resident children in a non-camp setting during conflict: follow-up study in Guinea-Bissau, *British Medical Journal*, vol.319 (7214): 878-881

Danida, (2005) (Danish International Development Agency) 'The Implementation of the National Policy for Internally Displaced Persons in Teso'

Elson, D. and Evers Cuskelly, G., McNulty, H. and Scott, J. (1996) 'Effect of Increasing Dietary Folate on Red Cell Folate: Implications for Prevention of Neural Tube Defects'. *The Lancet* 347: 657-9.

Engle, P (1990). Safe motherhood in refugee settings, *African Health*, May 19(4): 24-5

FAO (1983) (Food and Agricultural Organisation): Selecting interventions for nutritional improvement. A manual on Nutrition in Agriculture No.3. Rome, Food Policy and Nutrition Division.

FAO/WHO/UNU (1985) :(Food and Agriculture Organisation/World Health Organisation/University of United Nations) Expert Consultation Energy and Protein Requirements. WHO Technical Report Series No. 724. World Health Organisation, Geneva

FAO (1990): (Food and Agricultural Organisation) conducting small scale Nutrition surveys:

Field Manual, Rome.

FAO (1995): (Food and Agricultural Organisation) Agriculture, food and nutrition in post emergency and rehabilitation-issues, needs and interventions. Discussion paper for ACC/SCN Ad Hoc Working group on Household Food Security workshop Rome.

FAO (2005): (Food and Agriculture Organization) Protecting and promoting good nutrition in crisis and recovery. Resource guide. Food and Agriculture Organization of the United Nations, Rome 162 Pages

FAO (2005): (Food and Agricultural Organisation) Institute for Applied International Studies, Northern Uganda IDP Profiling Study, Volume 2: Northern Uganda IDP Study.

Ferro Luzzi ,A. and James, W.P.T, (1996). Adult malnutrition: simple assessment techniques for use in emergencies. *British Journal of Nutrition*, 75:3-10

Ferro-Luzzi , A. James ,W.P.T, (1994). Size and socio-demographic characteristics of the Afghan refugee population in Pakistan, *Journal of Biosocial Science*, July 22(3): 269-279

Fernald, W., (1998). Mortality among displaced former UNITA members and their families in Angola: a retrospective cluster survey, *British Medical Journal*, vol.327 (7416):650-0

FEWS NET (2005). Reproductive Health Indicators and Outcomes Among Refugees and Internally Displaced Persons in Post-emergency Phase Camps, *Journal of the American Medical Association*, August, vol.288 (5):595-603

Gelb, A. (2001). Gender and Growth: Africa's Missed Potential, Findings No. 197, Africa Region. World Bank, Washington, D.C.

Gibson, R.S. and Ferguson, E.L. (1999): ‘An interactive 24-hour recall for assessing the adequacy of iron and zinc intakes in developing countries’. Washington DC: International Life Sciences Institute.

Gillespie ,S. (1997): Improving Adolescent and Maternal Nutrition: An Overview of Benefits and Options. UNICEF, Staff working papers. Nutrition Series 97-002. New York.

Gueye, A. (2002). World Bank, and (UNECA), May 2002. The principal data source is Genderstats on the World Bank’s website, accessible at <http://genderstats.worldbank.org/>

Hatloy, A., Torheim ,L. and Oshaug ,A. (1998). ‘Food variety – a good indicator of nutritional adequacy of the diet? A case study from an urban area in Mali, West Africa’. *European Journal of Clinical Nutrition*, 52: 891–898

World Bank (1997): Vol. I and Vol. II, ‘Health and Nutrition Survey of Internally Displaced and Resident Population of Azerbaijan’ – April (1996), USAID, WHO, and UNICEF; Azerbaijan Poverty Assessment.

Helpage, (2004). Summary of research findings on the nutritional status and risk factors for vulnerability of older people in Africa

HRW (2005), (Human Rights Watch) ‘Uprooted and Forgotten: Impunity and Human Rights Abuses in Northern Uganda’.

Hutchinson, P. (1999). Health Care in Uganda: Selected Issues. World Bank Discussion Paper No. 404, Washington D.C.: The World Bank.

Isis-WICCE (2000) Women’s Experiences of Armed Conflict in Uganda Gulu District, 1986–1999. Kampala, Uganda: Available at: www.isis.or.ug/gulureportone.htm

IRIN (2004): (Integrated Regional Information Networks) ‘Fear sends scores of IDPs fleeing

from camps into Lira town’.

James, W.P.T, Mascie-Taylor, C. G. N, Norgan N. G., Bistran, B. R., Shetty, P. S., Ferro-Luzzi A. (1994). The value of MUAC in assessing chronic energy deficiency in Third World adults. *European Journal of Clinical Nutrition* 48:883-894. Iodine Deficiency Disorders.

Jamieson, D.J. (2000). An evaluation of poor pregnancy outcomes among Burundian refugees in Tanzania. *JAMA* 283(3): 397–402 Available at <http://jama.ama-assn.org/cgi/reprint/283/3/397.pdf>.

Kalpieni, E. and Oppong, J. (1998). ‘The Refugee Crisis in Africa and Implications for Health and Disease: A Political Ecology Approach’. *Social Science and Medicine* 46(12): 1637–1653

Khaw, A. J. (2000) ‘HIV Risk and Prevention in Emergency-affected Populations: A Review’. *Disasters* 24(3): 181–197.

Kikafunda, J. K., Walker, A. F., Collett, D. and Tumwine, J. K. (1998). ‘Risk Factors for Early Childhood Malnutrition in Uganda’. *Pediatrics*, Vol. 102, No.4, pg45-53 (Electronic version <http://www.pediatrics.org/cgi/content/full/102/4/e45>).

Kakitahi, J. T. (1981) Child Weaning, in Uganda In. Hautvast J. G. A. Maletnlema TN. Eds *Practical Considerations For Child Feeding in East, and Central and Southern African countries*, Wageningen, The Netherlands International Institute.

Kirksey, A., T.D. Wachs, and F.Yunis, (1994.) Relation of maternal Zinc nutriture to pregnancy outcome and infant development in an Egyptian village. *American journal of clinical nutrition* 60: 782-92.

Kmenta, J. (1971). Elements of Econometrics (2nd Edition) New York: Macmillan Publishing Company.

Magnani ,R. (1997). Sampling guide. IMPACT Food security and Nutrition Monitoring Project, Arlington, Virginia.

Mathesan, D. M., Varady J., Varady A., and Killen J. D. (2002): ‘Household Food Security and Nutritional Status of Hispanic Children in the Fifth Grade’. *American Journal of Clinical Nutrition*; 76: 210-7

Maxwell ,S., Frankenberger, T. R. (1992). Household food security: concepts, indicators, and measurements. A technical review New York, UNICEF and Rome, IFAD

McCullough, A.L, (1990) ‘Vitamin B₆ Status of Egyptian Mothers: Relation to Infant Behaviour and Maternal-infant Interactions’. *American Journal of Clinical Nutrition* 51: 1067-74.page 20.

McGinn,T.(2000) Reproductive health of war-affected populations: what do we know? *International Family Planning Perspectives* 26(4): 174–180 Available online at: www.agi-usa.org/pubs/journals/2617400.html.

MOH,(2005) (Ministry of Health), Republic of Uganda, July 2005, Health and Mortality Survey among Internally Displaced Persons in Gulu, Kitgum and Pader Districts, Northern Uganda. July 2005.

MFPEd, (2000), Ministry of Planning and Finance, Government of Mozambique / Universidade Eduardo Mondlane / International Food Policy Research Institute (1998) *Understanding Poverty and Well-being in Mozambique: The First National Assessment* (1996-97). Ministry of Planning and Finance, Maputo, and International Food Policy Research Institute, Washington, D.C.

(MFPEd), (2000): (Ministry of Finance, Planning and Economic Development) Background to the Budget 2000/2001: Increasing Efficiency in Poverty Reduction Service Delivery through Output Oriented Budgeting. The New Vision Printing and Publishing Corporation, Kampala.

OCHA (2004): (United Nations Office for the Coordination of Humanitarian Affairs) Guiding Principles on Internal Displacement. Geneva

Oxfam (2002), ‘Ugandan government must fulfil its responsibility to protect civilians in war torn north’. Situation Report.

Reed, B. A, Habicht ,J-P. and Niamego, C. (1996) ‘The effects of maternal education on child nutritional status depend on socio-environmental conditions’ *International Journal of Epidemiology*, 25, 585-592

RI (2004) (Refugee International) Nutritional status and mortality of refugee and resident children in a non-camp setting during conflict: follow-up study in Guinea-Bissau, *British Medical Journal*, vol.319 (7214): 878–881

RLP (2004), Communicable disease profile: Afghanistan and neighbouring countries. WHO/CDS 2002. Geneva: WHO, 2002.

Rogers, (1996) Profiles of refugee and non-refugee Palestinians from the West Bank And Gaza, *International Migration*, vol.38 (4): 79-107

Ruel, M.T, Habicht, J.P, Pinstrup-Andersen, P. and Gröhn, Y. (1992) ‘The mediating effect of maternal nutrition knowledge on the association between maternal Schooling and child nutritional status in Lesotho’. *American Journal of Epidemiology* 135, 904–914

Ruel ,M. T, Levin, C., Armar-Klemesu M., Maxwell. D. and Morris, S. (1999) ‘Good Care practices mitigate the negative effects of poverty and low maternal schooling on children's nutritional status: Evidence from Accra’. *World Development*.

Sahn ,D. (1994) ‘The Contribution of Income to Improved Nutrition in Côte d'Ivoire’. *Journal of African Economies*, 3 (1), 29-61

SCF(2007) Save the Children Fund) Household food economy approach. Available at www.savethechildren.org.uk/foodsecurity/other/uses.htm.

SCN (2000) Subcommittee on Nutrition Assessment of Nutritional Status in Emergency-Affected Populations – Adults Geneva: ACC/SCN.

Selassie, S. G, (2000) Demographic Factors, Employment and the Level of Welfare in the Africa Region, Ilo/Jaspa, Addis Ababa.

Shetty, P. S. and James, W.P.T. (1994) ‘Body Mass Index: Measure of Chronic Energy Deficiency in Adults’. FAO Food and Nutrition Paper 56.Rome.

Stoltzfus ,T. (1997) ‘Effect of maternal vitamin A or beta – carotene supplementation on iron deficiency anemia in Nepalese pregnant women, postpartum women and infants’. IVCG Abstracts, Cairo.

Strauss, J. and Thomas, D. (1995) ‘Human Resources: Empirical Modelling of Household and Family Decisions’. In Handbook of Development Economics Vol. 3A, ed. J.Behrman and Srinivasan T. N, North-Holland, NY. pp. 1883-2023.

Tafari, N, Naeye, R.L and Gobezie, A. (1980) ‘Effects of maternal under-nutrition and heavy physical work during pregnancy on birth weight’. *British Journal of Obstetrics and Gynecology*; 87:222-26.

Tomkins, A. and Watson, F. (1989): Mal-nutrition and infection: a review. The Lavenham Press Ltd., Lavenham, Suffolk.

Toole ,M.J and Waldman, R.J. (1990) ‘Prevention of excess mortality in refugee and displaced populations in developing countries’. *American Medical Association Journal*, 263:3296-3302.

Tomaseuski, K. (1999). Women and Human Rights, 3rd Edition. Zed Books Ltd. New York.

UDHS (2002) Uganda Demographic and Healthy Surveys (1998, 1995, 2000). Ministry of Health Entebbe Uganda and Demographic Health surveys Columbia MD Institute for Resource Development / Macro systems Inc.

UBOS (2003). Uganda Bureau of Statistics Report on the Uganda National Household Survey. Uganda National Census Report, 2002.

Underwood, B. (1994). ‘Maternal vitamin A status and its importance in infancy and early childhood’. *American Journal of Clinical Nutrition*, 59(supp): 517s-24s.

UNICEF(1995). Monitoring Progress Toward The Goals Of The World Food Summit For Children: A Practical Handbook For Multiple Indicator Surveys. New York.

UNICEF (1998) The state of the Worlds children. New York. Oxford

UNICEF(1999). Population Health Needs and Health Service Utilization in Southern Azerbaijan, November 2000, IMC/CIF/USAID; “Children and Women in Azerbaijan: A Situation Analysis”,

UNICEF, (2005); United Nations Children’s Fund, Northern Uganda Humanitarian Situation Report.

UN OCHA, (2005a); UN Office for the Coordination of Humanitarian Affairs – IDD support Mission to Uganda.

UN OCHA, (2005b); UN Office for the Coordination of Humanitarian Affairs OCHA – IDD support Mission to Uganda.

UN OCHA, (2005c); UN Office for the Coordination of Humanitarian Affairs
, Humanitarian Update September 2005.

Watkins ,G. and Politt, J. (1998). Nutritional status and mortality of refugee and resident children in a non-camp setting during conflict: follow-up study in Guinea-Bissau, *British Medical Journal*, vol.319 (7214): 878–881

Walker, A. F. (1990) Applied Human Nutrition. Ellis Horwood Ltd. West Sussex. England.

West, (1997).‘Impact of weekly supplementation with vitamin A or beta-carotene on fetal, infant and maternal mortality’. *IVACG Abstracts*. Cairo

Winkvist ,A., Rasmussen, K.M., and Habicht, J-P. (1992) ‘A new definition of maternal depletion syndrome’. *American Journal of Public Health*; 82:691-94.

WFP (2004), World Food Programme, CAP 2004 Food Situation Analysis

WFP (2005) World Food Programme, Emergency Food Security Assessment of IDP Camps in Gulu, Kitgum, Lira and Pader Districts.

WHO, (1996).World Health Organisation, Public Policy and anthropometric outcomes in the Côte-d’Ivoire.

World Bank (2000) Can Africa Claim the 21st Century? A Report Prepared Jointly by the African Development Bank, African Economic Research Consortium, Global Coalition for Africa, Economic Commission for Africa, and the World Bank, Washington, D.C.

World Bank (2002) Education and HIV/AIDS: A Window of Hope .Washington D.C.

www. Africawoman.net.Africawoman. September 2003.Issue 14. Editor: Lucy Oriang.

www.db.idpproject.org. (February 2004)*Understanding the EFNA and Nutrition Results* for Northern Uganda.

Yip, R. (1998). 'Recommendations to prevent and control iron deficiency in the United States'. Morbidity and Mortality Weekly Report 47(rr-3). Centers for Disease Control.

Zavaleta, N., Caulfield, L. and Garcia ,T. Hematologic changes in pregnant women receiving prenatal iron and zinc supplements. *The FASEB Journal*, Vol. 11, Abstract No. 2566, page A443. Experiment Biology Annual Meeting, New Orleans, 1997.

Appendix 1: Research questionnaire

Factors responsible for the high levels of maternal malnutrition in Erute internally displaced people's camp

Date_____

County_____ Sub-county_____

Parish_____ Village_____

Name of respondent _____

Name of interviewer _____

Name of supervisor _____

Introduction: Greetings. My name is _____. This is a study carried out by Mrs. L .G Agetta Komakech to find out why the women in the district are malnourished so that the problem can be addressed. Some of the questions may be sensitive but we are trying to see how the government can help. The information you give will be kept in strict confidence.

Section A.

household

I D	Full name (Include the infants)	Relation to the head of household	Sex Male=1 Female=2	Age in yrs/for Under fives record age in months	Education	Economic Activity	Marital status
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							

Marital Status:

1 = Single Adult;
3 = Polygamous married;
5 = Widowed;

2 = Monogamous married;
4 = Separated or Divorced;
6 = Still a child or pupil

Relation to Head of Household:

1 = Wife/Household;
3 = Mother/Father;
5 = Non-relative

2 = Son/Daughter;
4 = Relative;
6 = Others ____ Specify

Education Attained:

1 = No formal education
3 = Class 1-4 only;
5 = Few years in secondary school;
7 = Form 4+Training;
9=University;
11 = Not yet of school age

2=Adult education only;
4 = class 1-7 only;
6 = Form 4 only,
8 = Form6+Training;
10 = Still in school;

Economic Activity:

1 = Unemployed,
3 = Salaried employee,
5 = Informal business owner,
7 = Retired without pension,

2 = Farmer,
4 = Formal business owner
6 = Retired with pension,
8 = Others _____ (specify)

Tribe:

1= Lango
3 = Alur
5 = Others _____(specify)

2 = Acholi
4 = Kumam

Religion:

1 = Catholic
3 = Muslim
5 = African tradition

2 = Protestant
4 = Pentecostal
6 = Others _____ (specify)

Family type:

1 = Monogamous
3 = Extended family

2 = Polygamous

2a. Total number of children of the mother _____

2b Number alive _____

2c Number dead (if any) _____

IN CASE OF ANY DEATH (2c) TICK ALL THAT APPLY: Possible cause of death

01) Whooping cough,	02) Tuberculosis	03) Measles
04) Malaria	05) Diarrhoea	06) AIDS
07) Tetanus	08) Witchcraft/ghosts	09) Others

3. What was your age when you produced your first child?

- | | | |
|---------------|-----------|-------------|
| 01) <18 years | 02) 19-24 | 03) 25 - 29 |
| 04) 30-34 | 05) 35 | |

4. Household category:

- | | |
|------------------------|-------------------|
| 01) Male-headed | 02) Female-headed |
| 03) Single male-headed | 04) Child headed. |

5. Education level of household head

Education codes;

- | | |
|---------------------------|------------------------|
| 01) Primary incomplete | 02) Primary complete |
| 03) Secondary incomplete | 04) Secondary complete |
| 05) Tertiary | 06) University |
| 07) Others_____ (specify) | |

6. Age of the mother or the one mainly in charge of child-care_____

7. Education level of the one mainly in charge of child-care_____

(Use the same codes as those in question 5)

8. Number of children in household below 0-5 years

- a) Females_____ b) males _____

9. Number of school going children in the household

- a) Females _____ b) males _____

10. Number of other adults in the household

- a) Females _____ b) males _____

SECTION B

WATER, SANITATION AND ENVIRONMENTAL HYGIENE

11. What is the main Source of drinking water (Circle one)

- | | | |
|----------------------|---------------------|--------------------|
| 01) Private tap | 02) Public tap | 03) Protected well |
| 04) Unprotected well | 05) Rain harvesting | 06) River/Spring |

12. How long does it take to and from the main water source? Time _____Km_____

- | | |
|---------------------|-------------------|
| 01) 0-15min | 01) 0-2 KM |
| 02) 16-30 | 02) 2-4KM |
| 03) 32-60 | 03) 4-6 |
| 04) 61-120 | 04) 6-8KM |
| 05) More than 1 hrs | 05) more than 8km |

13. Do you do anything to the drinking water?

- | | |
|---------|--------|
| 01) Yes | 02) No |
|---------|--------|

14. If YES what do you do?

- | | | |
|----------------------------|----------------------------|-------------------|
| 01) Boil | 02) Boil and filter | 03) Sedimentation |
| 04) Filter | 05) Use herbs e.g. moringa | |
| 06) Other's _____(specify) | | |

15. How do you store your drinking water?

- | | |
|------------------------|----------------------------|
| 01) Plastic | 02) Clay pots |
| 03) Metallic container | 04) Others _____(specify) |

16. What is the main source of cooking water (Circle one)

- | | | |
|----------------------|---------------------------|--------------------|
| 01) Private tap | 02) Public tap | 03) Protected well |
| 04) Unprotected well | 05) Rain harvesting | 06) River/Spring |
| 07) Dam | 08) Others _____(specify) | |

17. Is the water available throughout the year?

- | | |
|---------|--------|
| 01) Yes | 02) No |
|---------|--------|

18. (b). If NO, what do you do when the water source dries up?

- | | | |
|--------------------------|----------------------|---------------------|
| 01) Move a long distance | 02) Buy from sellers | 03) other (specify) |
|--------------------------|----------------------|---------------------|

19. What activities are affected due to water scarcity in your household?

- | | |
|----------------------------|-------------------------------|
| 01) Less meals | 02) Less washing and cleaning |
| 03) Walking long distances | 04) Other _____ (specify) |

20. Who is mainly responsible for water availability? (Circle one)

- | | |
|---------------------------|------------------|
| 01) Wife | 02) Children |
| 03) Husband | 04) Hired labour |
| 05) Others _____(specify) | |

21. Do you have a latrine in this household/homestead?

- | | |
|---------|--------|
| 01) Yes | 02) No |
|---------|--------|

(If your answer is Yes, go to 22. If No, go to 23)

22. Indicate what type of latrine (enumerator to observe)

- | | |
|--------------------------|----------|
| 01) Traditional pit | 02) VIP |
| 03) Flush | 04) None |
| 05) Other _____(specify) | |

23. What does your household use?

- | | |
|-----------------|----------------------------|
| 01) Neighbours' | 02) Communal |
| 03) Bush | 04) Others _____(specify) |

24. Where do you dispose of your rubbish/garbage?

- | | |
|-----------------|----------------------------|
| 01) Compost pit | 02) Cows shed/feed animals |
| 03) Burry | 04) Burn |
| 05) Garden | 06) Others _____(specify) |

25. If none, what does the family normally use?

- [illegible]

26. What is the most used waste (house refuse) disposal method? (Circle one)

- 01) Burning 02) Mulching
03) Composite pit 04) Dumping
05) Other_____ (specify)

SECTION C: FOOD FREQUENCY

27. What is the frequency of consumption of the following foodstuff in the household?

What are their sources, and do you get enough?

Food	Daily	1-3 days/wk	Once in two wks	Once a month	Never	Food source	Enough 1=Yes /2=No
Cereals							
Millet							
Maize							
Sorghum							
Rice							
Tubers / plantain							
Cassava							
Sweet potato							
Banana (matooke)							
Legumes							
Beans							
Peas							
Ground nuts							
Animal foods							
Milk							
Beef/goat							
Poultry							
Pork							
Eggs							

Fish							
Beverages							
Maize porridge							
Millet porridge							
Tea with milk							
Black tea							
Fruit juice							
Vegetables							
Fruits							
Pineapples							
Wild fruits							
Oils/fats							
Vegetable oil							
Margarine							
Others (specify)							

Main Food Source codes:

- | | |
|---------------------------|-------------------------|
| 01) Own production | 02) Bought |
| 03) Donation/Relief | 04) Bought and own farm |
| 05) Other _____ (Specify) | |

28. What is the physiological status of the respondent where applicable)

1 = lactating, 2 = pregnant, 3 = non-lactating/pregnant

24-HOUR DIETARY RECALL FOR RESPONDENT

Ask the mother/respondent the following questions and fill in the responses in the table below.

29. Starting from morning to evening yesterday, please name all foods and drinks that the respondent consumed.

30 What amounts of foods and drinks did the respondent consume and how were they prepared?

Time/M meal	Name of Dish / Food	Name of Ingredients	Description ***	Method of** Preparation	Amount consumed
B/fast					

Lunch					
Supper					

**Codes for method of preparation:

- | | | |
|---------------|--------------------------|-------------------|
| 1 = Eaten raw | 2 = Boiled | 3 = Steamed |
| 4 = Roasted | 5 = Deep fried | 6 = Shallow fried |
| 7 = Baked | 8 = Other _____(specify) | |

***Codes for description

- | | | |
|------------|-------------|-----------------------|
| 1 = Fresh | 2 = Dried | 3 = Tinned |
| 4 = Frozen | 5 = Bottled | 6 = Others__(Specify) |

31. How many meals are eaten in a day by adults?

- | | | |
|---------------|-------------|-------------|
| 01) 1 meal | 02) 2 meals | 03) 3 meals |
| 04) > 3 meals | | |

32. What are the three most important staples in this household in order of importance?

- | | | |
|-----------|-----------|-----------|
| 01) _____ | 02) _____ | 03) _____ |
|-----------|-----------|-----------|

33. What are the three most important relishes (sauce) in this household in order of importance?

- | | | |
|-----------|-----------|-----------|
| 01) _____ | 02) _____ | 03) _____ |
|-----------|-----------|-----------|

34. What are the main sources of food for this household?

- | | |
|-------------------------|-------------------------------------|
| 01) Farm | 02) Bought/market/shop |
| 03) Donation/Relief | 04) Own farm and Bought/market/shop |
| 05) Other _____ specify | |

35. What foods are usually consumed during the following special occasions?

a) Funerals

- | | | |
|-----------|-----------|-----------|
| 01) _____ | 02) _____ | 03) _____ |
|-----------|-----------|-----------|

b) Christmas/Public (holidays)

- | | | |
|-----------|-----------|-----------|
| 01) _____ | 02) _____ | 03) _____ |
|-----------|-----------|-----------|

36. What foods and snacks do you have a special liking for and are in large amounts when you are pregnant and lactating

Types of foods/snacks	When pregnant	When lactating

SECTION D

EVALUATION OF THE TYPE OF LIVING CONDITIONS

37. Out of which material are walls / floor of the main house made?

Wall	Floor	Roof
1. Straw or bamboo 2. Mud 3. Unburnt mud bricks 4. Burnt bricks 5. Cement or stone blocks 6. Mud and cement 7. Other _____ specify	1. Mud 2. Cement 3. Others _____ specify	1. Thatched 2. Mud 3. Corrugated iron 4. Tiles 5. Others _____ specify

Do you possess the Following items?	Source of light	Source of fuel for cooking
1. Radio YES/ NO 2. Bicycle YES/ NO 3. Oxen cart YES/ NO 4. Cows (how many?) _____ 5. Goats (how many?) _____ 6. Sheep (how many?) _____ 7. Chickens (how many?) _____ 8. Pigs (how many?) _____	1. Kerosene lamp 2. Kerosene burner 3. Open fire 4. Others (specify) _____	1. Fire wood 2. Charcoal 3. Paraffin

38. What is the main type of fuel that is usually used for cooking in the household? (Circle one)

- | | | |
|-----------------------------|-----------------|-----------------|
| 01) Firewood | 02) Charcoal | 03) Paraffin |
| 04) Dry twigs, leaves | 05) Natural gas | 06) electricity |
| 07) Other's _____ (specify) | | |

39. What is the main source of fuel for your household? (Circle one)

- | | | |
|------------------|----------------------------|---------------------|
| 01) Plain forest | 02) Natural private forest | 03) Communal forest |
| 04) Plantation | 05) Buying | 06) Self generated |

07) Other's _____ (specify)

40. Who is mainly responsible for fuel availability? (Circle one)

01) Wife

02) Children

03) Husband

04) Hired hand

05) Others _____ (specify)

41. a.) What is the distance (in km) from the nearest main road (one which is easily passable?) _____ Km

b) Distance(in km) to the nearest market _____ Km

SECTION E: FOOD SECURITY INDEX

42. In the past month, how often has your food supply run out before you were able to get more food from either your garden or the market?

1 = Never

2 = Sometimes

3 = Often (almost everyday)

43. In the past month, how often have you had to borrow money for food in order to ensure that your household eats enough?

1 = Never

2 = Sometimes

3 = Often (almost everyday)

44. In the past month, how often have you had to limit the amount that you yourself ate in order to make sure that the other members of the household eat enough food?

1 = Never

2 = Sometimes

3 = Often (almost everyday)

45. In the past month, how often have you or your children been forced to skip meals because the food is not enough?

1 = Never

2 = Sometimes

3 = Often (almost everyday)

46. In the past month, have you worried that **you yourself** is not getting an adequate diet?

1 = Yes

2 = No

47. In the past month, have you worried that the children or other members of the household are not getting an adequate diet?

1 = Yes

2 = No

48. In the past month, have you had to reduce your household size to reduce food costs?

1 = Yes

2 = No

49. In the past month, have you had to sell some of your non-productive household assets to buy food?

1 = Yes

2 = No

50. In the past month, how often have you or your children been forced to go for a whole day without eating because the food is not enough?

1 = Never

2 = Sometimes

3 = Often (almost everyday)

51. In the past month, how often has the food for your household been insufficient?

1 = Never

2 = Sometimes

3 = Often (almost everyday)

COPING STRATEGIES WITH RESPECT TO FOOD SHORTAGE

52. Record sequence of response (by Respondent) during the household's latest incidence of food shortage by placing a tick against the response in the last column

	Response	Tick
1 .	Diet change (e.g. reduction in the number of meals per day)	
2 .	Use of famine foods (e.g. foods that are not normally eaten, including foods from the wild)	
3 .	Borrow foods from relatives (including distant relatives)	
4 .	Receive relief foods	
5 .	Sell labour to others	
6 .	Acquire part time job (after work)	
7 .	Selling off livestock which would not have been sold under normal circumstances	
8 .	Borrow grain or cash from merchant (that include interest)	
9 .	Sell or mortgage some valuable domestic assets (e.g. radio, bicycle, watch, furniture etc.)	

SECTION H: INCOME AND HOUSEHOLD EXPENDITURE

53. Income in the past (Tick all that apply)

01) Cash brought with them

02) Animals brought with them

03) Formal business

04) Salary (employment)

05) Informal business

06) Retired with pension

07) Other _____ specify

54. What is your current source of income or employment (tick all that apply)

- | | |
|---------------------------------|---|
| 01) Relief sales | 02) Agricultural labour or domestic service |
| 03) Petty Business | 04) Salary (Employment Generation schemes) |
| 05) Wage earner (casual labour) | 06) Sale of livestock |
| 07) Prostitution | 08) Local beer marketing |
| 09) Sale of household items | 10) Remittances |

55. What is the **main source** of your household income? (Use the same codes in QN 54).

56. Household's cash expenditure per year

Item	Estimated expenditures	
1. Food		
2. Clothing		
3. Education e.g. school fees, school uniforms, books, etc)		
4. Health costs (e.g. medicines, etc)		
5. Festivities (Iddi, Christmas, etc)		
6. Transport and communication		
7. Cost of funerals		
8. Expenditures related to farming activities such as seeds, tools, etc		
9. Other household consumables (soap, kerosene, sugar etc)		
10. Other expenditures specify		
11. Room rent		
12. Household items e.g.		

57. What general problems do you encounter in your living places? (Tick all that apply)

- 01) Looting of personal belonging
- 02) Loss of livestock
- 03) Destruction of houses, clinics, schools and water points
- 04) Displacement due to enemy occupation, shelling, mines and army use of home area

SECTION F: NUTRITION KNOWLEDGE ASSESSMENT

58. What is the true meaning of the term "nutrition"? (Choose one)

- 01) Good foods of varying types

- 02) Relationship between food eating and body health
- 03) Condition of being fat
- 04) Ability to be able to select foods
- 05) I don't really know
- 06) Others _____(specify)

59. Have you ever been exposed to any nutritional education?

- 01) YES
- 02) NO

60. Which of the following is the best method for acquiring good nutrition? (**Tick one**)

- 01) To eat sufficient and varying types of foods
- 02) Only eating of foods rich in vitamins.
- 03) Selecting foods that are rich in protein
- 04) Taking tablets as supplements
- 05) Others _____ (specify)

61. Is there a relationship between the foods that we eat and some health disorders that we get?

- 01) Yes
- 02) No
- 03) I don't know

62. IF the answer to 61 above is yes, can you name at least one example of such health disorder?

- 01) _____
- 02) _____
- 03) _____

63. What is the main cause for night blindness, especially for young children? (Choose one)

- 01) Foods that we eat
- 02) Water that we drink
- 03) I don't know
- 04) Other _____(specify)

64. What do you understand by the term malnutrition?

65 What are the causes of malnutrition?

- 01) _____ 02) _____
- 03) _____
- 04) _____

SECTION G. HEALTH

65 **HIV/AIDS**

This module is to be administered to all women age 15-49.

See Instructions for Interviewers for further discussion of these questions.

1. Now I would like to talk with you about a serious illness, in particular, HIV and AIDS. Have you ever heard of the virus HIV or an illness called AIDS?

- 01) Yes
- 02) No

2. Is there anything a person can do to avoid getting HIV, the virus that causes AIDS?

01) Yes

02) No

03) DK (Don't know)

3. Now I will read some questions about how people can protect themselves from the AIDS virus. Your answers are very important to help understand the needs of people in (*Uganda*). Again, this information is all completely private and anonymous. Please answer 'Yes' or 'No' to each question.

Can people protect themselves from getting infected with the aids virus by having one uninfected sex partner who also has no other partners?

01) Yes

02) No.

03) DK (Don't know)

4. Do you think a person can get infected with the aids virus through supernatural means?

01) Yes

02) No.

03) DK (Don't know)

5. Can people protect themselves from the aids virus by using a condom correctly every time they have sex?

01) Yes

02) No.

03) DK (Don't know)

6. Can a person get the aids virus from mosquito bites?

01) Yes

02) No.

03) DK (Don't know)

7. Can people protect themselves from getting infected with the aids virus by not having sex at all?

01) Yes

02) No.

03) DK (Don't know)

8. Is it possible for a healthy-looking person to have the aids virus?

01) Yes

02) No.

03) DK (Don't know)

9. Can the aids virus be transmitted from a mother to a child during pregnancy?

01) Yes

02) No.

03) DK (Don't know)

10. Can the aids virus be transmitted from a mother to a child at delivery?

01) Yes

02) No.

03) DK (Don't know)

11. Can the aids virus be transmitted from a mother to a child through breast milk

01) Yes

02) No.

03) DK (Don't know)

12. If a teacher has the aids virus but is not sick, should he or she be allowed to continue teaching in school?

01) Yes

02) No.

03) DK (Don't know)

13. If you knew that a shopkeeper or food seller had aids or the virus that causes it, would you buy food from him or her?

01) Yes

02) No.

03) DK (Don't know)

14. I am not going to ask you about your HIV status (*use term understood locally*), but we are interested to know how much demand there is in your community for HIV testing and

counselling. So, I would like to ask you: I do not want to know the results, but have you ever been tested to see if you have HIV, the virus that causes AIDS?

01) Yes

02) No.

15. I do not want you to tell me the results of the test, but have you been told the results?

01) Yes

02) No.

16. At this time, do you know of a place where you can go to get such a test to see if you have the aids virus?

01) Yes

02) No

66. MALARIA

1. In the last two weeks, that is, since (day of the week) of the week before last, has (name) been ill with a fever?

01) Yes

02) No

2. Was (name) seen at a health facility during this illness?

01) Yes

02) No.

03) DK (Don't know)

3. Did (name) take a medicine for fever or malaria that was provided or prescribed at the health facility?

01) Yes

02) No.

03) DK (Don't know)

4. What medicine did (name) take that was provided or prescribed at the health facility?
(Tick)all medicines mentioned. (Develop categories to include locally-used drugs, and then pre-test)

01) Paracetamol ____

02) Chloroquine____

03) Fansidar ____

04) Other_____(specify)

05) DK(Don't know)_____

5. Was (name) given medicine for the fever or malaria before being taken to the health facility?

01) Yes

02) No.

03) DK (Don't know)

6. Was (name) given medicine for fever or malaria during this illness?

01) Yes

02) No.

03) DK (Don't know)

7. DID (name) SLEEP UNDER A BEDNET LAST NIGHT?

01) Yes

02) No.

03) DK (Don't know)

8. Was this bed net ever treated with a product to kill mosquitoes?

01) Yes

02) No.

03) DK (Don't know)

9. When was the bed net last treated?

01) Months ago

02) DK Don't know

SECTION H: ACCESS TO HEALTH FACILITIES

67. Do you receive any kind of health service when you are sick?

01) Yes

02) No

68. If yes where do you receive it from?

01) Government hospital

02) Private clinic

03) local herbs

04) Prayers

05) Others _____(specify)

69. SECTION I: ANTHROPOMETRY

INSTRUCTIONS: Collect information for all the respondents.

RESPONDENT	Sex	Reported in yrs	Date of birth	Weight in (kg)	Height (in cm)	MUAC (in cm)

THANK YOU!!!!!!!!!!

Appendix 2.

Table 1 indicates the cut-offs for the different categories of nutritional status of adults as reported by FAO (2005).

Table1. Cut-offs for MUAC and BMI malnutrition indicators in adults

Parameter	Adequately nourished	Under-nourished	Severe malnutrition/extreme wasting
MUAC			
Men	≥ 230 mm	229-200 mm	199-170 mm < 170 mm
Women	≥ 220 mm	219-190mm	189-160 mm < 160 mm
BMI			
Adults: 20-59.9 years	≥ 18.5	18.4-13	12.9-10 ≤ 10

Source; Ferro- Luzzi and James (1996)

Appendix 3

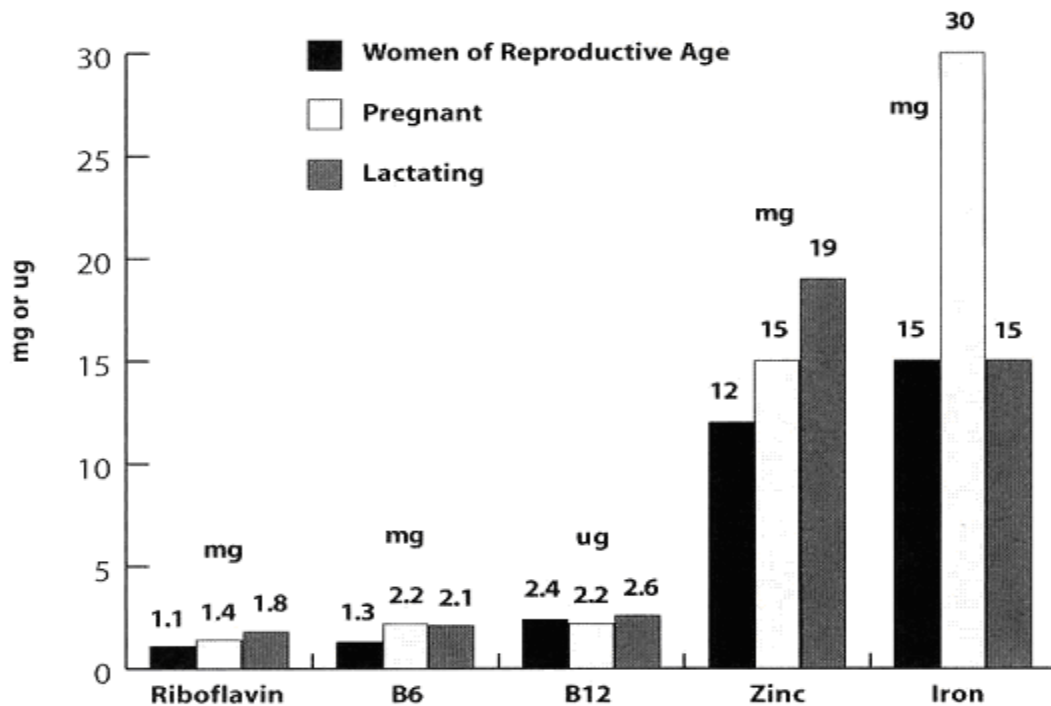


Figure 2: Comparisons of RDAs for women of reproductive age, pregnancy, and lactation. (Adapted from Zavaleta N., Caulfield L. and Garcia T)