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**EFFECTS OF SHORT-TERM HUNGER ON SCHOOLING AMONG
UNIVERSAL PRIMARY SCHOOLS IN KAMULI AND SOROTI
DISTRICTS, UGANDA.**

By

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MAKERERE UNIVERSITY**

NOVEMBER 2012

DECLARATION

I Loga Dorcas Elizabeth do hereby declare that this research work is original and has never been published or presented to any institution for an award of a degree.

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DEDICATION

To my lovely husband Chris and daughter Shalom

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DEFINITION OF TERMS

Short term hunger: A type of hunger that causes one to feel an abdominal discomfort, illness, weakness, or pain caused by skipping a meal due to lack of food.

Bodaboda: A passenger motor cycle used as a means of transport.

Amukeke: Dried sweet potato chips

LIST OF ACRONYMS

EFA	Education For All
FAO	Food and Agricultural Organization
FDG	Focus Group Discussion
GoU	Government of Uganda
MDGs	Millennium Development Goals
MoES	Ministry of Education and Sports
SPSS	Statistical Package for Social Scientists
UN	United Nations
UNEB	Uganda National Examinations Board
UNESCO	United Nations Educational, Scientific and Cultural Organization
UPE	Universal Primary Education
WFP	World Food Program

ABSTRACT

Universal Primary Education (UPE) was introduced in Uganda in 1997 as a landmark ahead of the Millennium Development Goal (MDG) No.2 agenda whose target was of ensuring that all children, both boys and girls, complete primary education by 2015. During the implementation stage, the Government of Uganda realized that parents were not willing to contribute any fees partly because of many other demands they had to shoulder, so the government did not only scrape parents' contributions but also went ahead and banned all other forms of fees (including lunch), further complicating the running of UPE. This led to pupils suffering from short term hunger while at school. It is against this background that this research was carried out to find out the effects of short term hunger on schooling among universal primary schools in Kamuli and Soroti districts. A survey was carried out and a total of 320 pupils participated, equal numbers coming from 8 schools from both Kamuli and Soroti. Descriptive statistics were computed to characterize the feeding patterns, Content analysis was done to describe the perceived effects of short-term hunger and the strategies used by pupils to cope with the same, and a correlation was run to determine the influence of the perceived effects of short term hunger on pupils' attendance, learning and concentration. Results showed that although 75% of the schools had a school feeding program, 72% of the parents could not afford to contribute towards it, so their children did not have a meal at school. Only 7% participated in the program in Soroti and 46% participated in Kamuli, leading to 58.8% of the pupils going hungry throughout lunch time. Pupils' devised their own means of coping with hunger which included looking for fruits (28%), begging from friends (18.5%), escaping from school (9%). This affected students': learning unaffected, since 42% of the pupils lost concentration; 41% did not understand what the teacher taught; and, 32% doped in class in the afternoon. This led to low average mark at the end of the term. All scored an average mark less than 40% which is the UNEB pass mark. A Correlation run showed a significant relationship between pupils' attendance to school both in the morning and in the afternoon, their concentration levels in the afternoon, and their average mark at the end of the term. It was concluded that hunger affects pupils'

learning hence their average mark at the end of the term, therefore impeding the sole purpose for which UPE was established.

CHAPTER ONE – INTRODUCTION

1.1 Background

Education is the society's main instrument for reproducing itself and can be a key ingredient for social change including poverty eradication (Birdsall, Levine and Ibrahim, 2005). Basic education such as Universal Primary Education (UPE) is one step towards improving the welfare of the poor who would otherwise be unable to invest into education which is a long-term strategy to curb poverty. Indeed, achieving Universal Primary Education is No. 2 of the United Nations Millennium Development Goals (MDGs). Its target is to have all children in the world attain a full course of primary education by 2015 (UN, 2000). Ahead of the formulation of the MDGs, the Uganda of Government (GoU) launched UPE in 1997. Within the first two years of its implementation, UPE program tripled enrollment in primary education (Ndeezi, 2000). Under the UPE arrangement, the government pays tuition fees and provides grants to schools to cater for instructional materials, co-curricular activities such as sports, school clubs, and the management and maintenance of utilities such as water and electricity. The parents are left with the responsibility of providing uniforms, scholastic materials and feeding the pupils while at school.

Overall, the purpose of UPE is to lay the foundation for improved social wellbeing of the majority of the population through enhanced literacy and numeracy. Filmer *et al* (2006) however cautions that if education systems are weak, more public spending and higher enrollment may not translate into learning and concomitant increase in the

human capital. To achieve the UPE benefits, the conditions at school including school feeding for both the teachers and pupils have to be adequate.

In order to meet the children's feeding needs; parents were required to pay some money to cover the cost of a meal (lunch). However, given the high poverty levels which were especially prominent in the rural communities, the cost of feeding in UPE schools became prohibitive to school enrollment. The response to this was for government to scrap the mandatory feeding program for day scholars in UPE schools with the intention of relieving parents of the cost of feeding. The policy on school feeding is that parents who can afford to pay are allowed to make feeding arrangements with the school management, and that pupils whose parents cannot afford the cost of a school meal provide food (in kind) for their children to carry to school (Uganda Budget, 2007/2008). Since many parts in the Eastern region experience unstable food security situations, it is unlikely that most children will have enough food to eat at their homes and even more critically have any reserved and packed for them to eat while at school.

In circumstances where children are not able to feed while at school, they experience short-term hunger. Adverse effects of the same have a marked impact on learning, thus counteracting the overall purpose of UPE. It is here called so, because the children are not able to access food for the time they are at school, though they may be able to eat when they get back to their homes. During the period they are at school they experience hunger though it is short term. The World Declaration on Education for All identifies poor health and nutrition as one of the crucial underlying factors influencing low enrollment, absenteeism, poor classroom performance and a high

school dropout rate in many African countries (UNESCO, 2002). Short term hunger is one of the major factors that contribute to that phenomenon.

1.2 Problem Statement

The government policy on school feeding clearly stipulates the responsibility of parents to meet the feeding needs for their school going children in UPE schools. In view that many parts in Kamuli and Soroti Districts experience unstable food security situations, the ability for all households to provide food to the school going children can be doubted. Under the given circumstances, the effect of short-term hunger among UPE pupils is inevitable. The effects of short-term hunger in relation to enrollment and school drop-out among UPE pupils and schools have been a contentious issue related to the UPE program in Uganda, though it is so far discussed rather informally in the media (for example; The New Vision, 9th April 2010; Daily Monitor, 15th October 2009).

Informed discussions that can lead to credible decision making on how to deal with the challenge of short-term hunger in UPE schools is limited by lack of empirical evidence. In addition, no information exists that explains how the UPE children in vulnerable areas experience and cope with the short-term hunger and its impact on schooling. There is a gap in availability of credible evidence on the impact of short-term hunger in UPE schools in Uganda. This study therefore seeks to establish the perceived effects of short-term hunger on schooling in UPE schools focusing on Kamuli and Soroti districts.

1.3 Research Objectives

The overall objective was to establish the perceived effects of short term hunger on the academic achievement of pupils in UPE schools in Soroti and Kamuli districts.

Specifically, the research sought to:

1. Characterize the feeding patterns of pupils in UPE schools.
2. Describe the perceived effects of short term hunger among pupils in UPE schools in Kamuli and Soroti districts.
3. Describe strategies used by pupils to cope with the challenge of short term hunger.
4. Determine the relationship of the effects of short term hunger such as attendance and concentration on academic achievement of pupils in UPE schools in Kamuli and Soroti districts.

1.4 Justification

This study was undertaken to find out the effects of short-term hunger on schooling among universal primary schools in Kamuli and Soroti districts. It was anticipated that the results of this study were essential for appropriate decision making by all stakeholders in primary education, i.e. the teachers, parents, researchers and policy makers. This research was meant to enlighten the teachers, parents and researchers on to what extent lack of feeding at school affected pupils' academic achievement, therefore giving them a basis to step up school feeding. The recommendations from this study were also expected to form the basis for policy initiatives, especially in providing evidence for rethinking the policy concerning the school feeding program in UPE schools at the district and national levels.

1.5 Limitations of the Study

Whereas the results would have been more beneficial if the coverage was wider covering the major regions of the country to take into account the diversity of conditions, this study was limited to only one region and more so to only two districts. This limited the generalization of the findings beyond the districts, even though the results gave a general impression of what is happening in UPE schools in Eastern Uganda.

The other limitation was that the study discussed issues related to provision of food to the pupils while at school but it did not discuss the nutritional issues in depth. Although this was recognized to be an important issue in school feeding programs, the nutritional aspects were beyond the scope of this study.

CHAPTER TWO - LITERATURE REVIEW

2.1 Universal Primary Education in Uganda

Uganda's launch of the Universal Primary Education (UPE) in 1997 was a landmark ahead of the Millennium Development Goal (MDG) No.2 agenda whose target was ensuring that all children, both boys and girls, complete primary education by 2015 (UN, 2000). UPE in Uganda is part of the broader and long-term strategy for transforming and modernizing society through the elimination of illiteracy and the provision of Education for All - irrespective of one's gender, disability or any other categorization (Ndeezi, 2000). In the UPE policy, initially government was to provide "free" education to a maximum of four children from each family. This however changed when the president of the republic of Uganda: His Excellency Yoweri Kaguta Museveni declared that; "*all children of school-going age should benefit from Universal Primary Education (UPE)*" (Olupot, 2002). The main objectives of UPE according to Bategeka and Okurut, 2004 are to:

- Provide the facilities and resources to enable every child to enter and remain in school until the primary cycle of education is complete.
- Make education equitable in order to eliminate disparities and inequalities.
- Ensure that education is affordable by the majority of Ugandans
- Reduce poverty by equipping every individual with basic skills

Following the introduction of UPE, enrolment in primary school increased from 3.1 million in 1996 to 7.6 million in 2003 - an increase of 145% (4.5 million children), compared to an increase of 39% (0.9 million children) between 1986 and 1997 (MoES, 2005). Further still, in 2003, enrollment of girls in primary schools was slightly over 49 percent of total, falling behind that of boys. This was a significant

improvement compared to 44 percent and 44.5 percent for 1990 and 1993 respectively. The post UPE period witnessed a narrowing gap between the number of girls and boys enrolled in primary schools (MoES, 2005).

Despite the fact that primary education was neither made compulsory, nor entirely free, parents were still expected to contribute pens, exercise books, clothing, bricks and labor for classroom construction (Bategeka and Okurut, 2004). During the implementation stage, the Government of Uganda (GoU) realized that parents were not willing to contribute bricks and labor, partly because of many other demands they had to shoulder. In addition, Prof. Ssentenza Kajubi (The Observer, 13 December 2009), reports that government did not only scrape parents' contribution to construction material, but also went ahead and banned all other forms of fees (including lunch), further complicating the running of UPE. If, for example parents, don't pay lunch fees, the pupils cannot have lunch at school, something that does not only affect their learning but also their retention in school.

2.2 How Hunger complicates the running of UPE

Hunger is abdominal discomfort, illness, weakness, or pain caused by a prolonged, involuntary lack of food (Future Harvest Centers, 2004). Hunger is usually caused by a number of reasons, for example poverty, natural disasters, for example, the mudslide which happened 3rd March 2010 in Bududa, Eastern Uganda, and the Awoja River floods that destroyed property and crops in Soroti district in August 2008. Other reasons include armed conflict, for instance the Northern and North Eastern regions of Uganda which suffered from prolonged hunger because of rebel attacks since 1986.

In addition, Musamali, Waligo, and Mbagaya (2007) point out that the problems of hunger in society are usually seen as incidental crises situations often addressed by food supply from external sources. However, the long-term solution lies in equipping the future citizens (children) with the right attitude and capabilities to produce food on a sustainable basis. The starting point is the primary schools since pupils drop-out before completing primary seven and resort to farming as a livelihood. World Bank (2007) and Murphy (2003) put the completion rate for primary level education at 57% and progression to the secondary level at 37.8%. Nonetheless, data from the Ministry of Education and Sports portrays a worse situation. Out of the 2,159,850 pupils enrolled as UPE pioneer intake in 1997, only 22.5% completed primary seven in 2003, the rest are thought to have resorted to farming in order for them to earn a living.

2.3 Feeding Culture in Schools

Schools practice In-School feeding where meals are provided to pupils while at school. For schools that provide meals, the main objective is to provide mid-morning meals, lunch, or a combination, depending on the duration of the school day. This is done to alleviate short-term hunger, increase attention span, facilitate learning, and obviate the need for children to leave the school to find food (Bundy, Burbano, Grosh, Gelli, Jukes, and Drake, 2009). In-school meals also act as an incentive to increase school access and enrollment. Feeding programs benefit poor children by creating incentives to enroll in and attend school, and it also improves health, attentiveness, and capacity to learn (WFP, 2009). The Carnegie Foundation (1990) revealed that more than half of the teachers surveyed reported that poor nourishment among pupils was a problem at their school. Research has further shown that children who skip

breakfast have trouble concentrating at school and become inattentive and restless by late morning (Pollitt, 1995). Offering meals at school is an effective way to encourage children who are poor and chronically hungry to attend classes (Birdsall *et al.* 2005).

With respect to provision of meals in UPE schools, the growing food insecurity has become a genuine concern. Communities that experience food shortages find it difficult to provide food for their children to take to school if the schools do not provide the meals. This creates a condition that deters the pupils from attending school. For example, in Labwor Oyeng Primary School in Kitgum district; Uganda, several children do not attend school on regular basis because of hunger (Ouma, 2009). There is therefore an overwhelming need for government to introduce programs to increase food and nutrition securities in schools to encourage academic achievement, attendance to, and concentration in school (Ouma, 2009).

2.4 Effects of Feeding on Schooling

It is well known that breakfast is the most important meal of the day. A nutritious breakfast provides approximately a quarter of the recommended dietary allowances for key nutrients such as protein, vitamin A, vitamin B6, calcium, magnesium, iron and zinc to a child preparing for school (Pollitt, 1995). This is even more critical for children than adults. Hunger has both physical and psychosocial symptoms on children. Physical consequences of hunger include: stomach pain, headache, muscle fatigue, and sleepiness. Psychosocial consequences of hunger include: anxiety, nervousness, anger, restlessness, hostility, indecisiveness, confusion, and unhappiness are also common. Transient hunger (short-term hunger) has a profound effect on a

child's physical and mental readiness for their school day, significantly impairing their ability to learn (Dairy Council of California, 2009)

According to the Dairy Council of California (2009), children who skip breakfast have trouble concentrating at school and become inattentive and restless by late morning. Children who eat at school perform better on standardized tests and are late or absent from school less often. Other studies in children have shown that consumption of nutritious food during the day results in; improved attention in late morning task performance, quicker and more accurate retrieval of information, fewer errors made in problem solving activities, and, better concentration and ability to perform complex tasks (Tomlinson, 2007).

Therefore it is very evident that children who have been fed at school perform much better and can easily remain in school until they finish the primary section than their counterparts who do not feed at school. Those who don't feed at school are more likely to drop out of school before completing primary seven, and they decide to do anything that will help them acquire a decent meal, eventually leading to illiteracy.

Birdsall *et al.* (2005) point out that; there are some interventions that have got hard-to-reach children into school. These include eliminating school fees, instituting conditional cash transfers, using school feeding programs as an incentive to attend school, and implementing school health programs to reduce absenteeism. Hunger and chronic malnutrition reduce learning achievement of children already in school. In poor households the problem begins early, with malnutrition and poor health of mothers, who eventually give birth to children of low birth weight (Anon, 2009). In the absence of special interventions, these children often lack the micronutrients and

energy required for normal development, critical to their learning once in school. (Birdsall *et al.* 2005)

The Food and Agricultural Organization (FAO) estimates that 300 million children, most of them in developing countries, are chronically hungry. In addition, studies by FAO in many countries suggest that hunger affects cognitive functions and may therefore impair a child's ability to benefit from schooling. Birdsall *et al.* (2005) point out that a program that provided breakfast to primary school children in Jamaica significantly increased arithmetic scores. School feeding programs that address specific micronutrient deficiencies have also been shown to improve school performance.

2.5 Effects of Feeding on Learning

Feeding is both an input to and output of better health, quality education, and optimal productivity. Good feeding is thus an essential element of a child's ability to attain her or his full potential in education: if a child's body is well fed, his or her mind will be more receptive to learning and execution of other related tasks and responsibilities (Grantham, 2005). Poor feeding reduces intellectual (brain) and psychomotor (muscle and skeletal) development thereby lowering the cognitive (IQ) achievement, creativity, skill acquisition and competency and the affective (moral and social) development (Janke, 2001). Food and nutrition are therefore essential for optimal and sustenance of physiological, physical and psychosocial growth and development, especially during early years of life.

Feeding has been acknowledged as the greatest bottleneck to both children's access and benefit to education for the few who manage to get to school (Jukes *et al*, 2009). By virtue of the fact that poor feeding is common among the poor, most vulnerable and disadvantaged children in developing countries, of which Uganda is among, implies that these are the groups that are most affected in terms of accessing and benefiting from quality education, posing a significant challenge to the attainment of Education for All (EFA) efforts and the Millennium Development Goal two. The success of child survival programs and efforts by many governments and communities to promote child nutrition status and school feeding have resulted both in a greater number of school age children surviving beyond their fifth birth day and in a greater proportion of these attending school. School nutrition and feeding programs offer an essential complement to early childhood care, development programs and enable children to take full advantage of what may be their only opportunity for formal learning.

A number of studies have been carried out to determine whether there is a relationship between feeding/no feeding and achievement in class:

- One study carried out in Kenya by Whaley *et al*. (2003) on effects of fluid intelligence, found a significant effect; children in the group which received meat gained mental ability at an average rate of 0-34 points per year more than those in the control group. The same study in lower income countries found significant effects of school meals on intelligence test scores. Children who were given school meals had an end-of-study full-scale Intelligence Quotient (IQ) that was 4 points higher than children who did not receive school lunch.

- In Malawi, a study conducted by the United Nations WFP showed that a small pilot school feeding program had over a three-month period led to a five percent increase in school enrollment and up to 36 percent improvement in attendance.
- In Uganda, the second participatory poverty assessment report of 2002 indicated that children studying “on empty stomachs” are easily distracted and have problems concentrating on their lessons. The report indicated that short term hunger impedes a child's ability to learn and achieve full educational attainment and conclusively affirmed that hunger was an impediment to the implementation of the Government’s policy on Universal Primary Education (UPE).

2.6 School Feeding Programs

School feeding programs serve as a magnet to bring children to school, and to improve their ability to learn and concentrate. They are also among the most effective tools at increasing access to education and improving nutritional status of children. For a minimal investment, lives can be transformed in fundamental ways. Many developed nations, including Japan, United States, United Kingdom, Italy and France, have long histories of supporting national school feeding programs.

Experience shows that properly designed and effectively implemented school feeding programs can alleviate short-term hunger and improve cognitive ability. The evidence that school feeding programs alleviate short-term hunger is very strong (Janke, 2001). Much research has also been conducted on the effects of short-term hunger related to learning capacity. When a child is hungry due to skipped meals or much activity, their ability to learn is dramatically decreased. In many cultures, breakfast is not provided.

This means the child may not have eaten since the evening before. That combined with long travel times, may mean the child begins school hungry and unable to concentrate (Janke, 2001). The provision of even a small snack at the start of the day or mid-morning alleviates short-term hunger and has been linked to increased awareness, activity and learning capacity (Grantham, 2005).

School feeding programs increase enrollments and improve attendance. There is much evidence to suggest that school feeding programs increase enrollment and attendance in school, particularly amongst girls (Levinger, 2005 and Tomlinson, 2007). Food can act as a strong incentive for children to attend school on a regular basis. Girls especially benefit from this, as parents may feel there are sufficient income-transfer benefits (meaning the meal/food provided acts as a form of income savings/benefit as they do not have to spend as much on food). Often, girls are not encouraged to attend school due to cultural practices, beliefs about education and they are needed to provide valuable labor and contribute to the household.

School feeding programs improve micronutrient status. According to Siekmann *et al.* (2003), providing foods rich in micronutrients that are not a regular part of children's diets may help to reduce micronutrient deficiencies. Lack of diet diversity and a high prevalence of infection in many developing countries can contribute to inadequate micronutrient status. This is often referred to as 'hidden hunger' as the effects are not always visible. However, inexpensive supplements and provision of food that is not typically part of a child's diet can improve micronutrient status and hence improve concentration and growth and reduce morbidity. Key micronutrients provided in

school meals are iron, zinc, and vitamin A, which all improve resistance to infection and improve growth. Iron supplementation has been linked to improved cognitive ability. While the evidence related to improvements in overall nutritional status is weak, there is good evidence to suggest that school feeding programs, when designed with micronutrients in mind, can greatly improve micronutrient status (WFP, 2004).

School feeding programs improve nutritional status. The evidence that school-feeding programs can improve nutritional status in the long-term is inconclusive and weak (Tomlinson, 2007). The physical growth of children is a result of a number of interconnected variables, especially in areas where poverty is endemic. Environmental factors, genetics, food consumption patterns, health and illness, hygiene practices, lack of sanitation and the onset of puberty are but a few (Janke, 2001; Bennett, 2003 and Grantham, 2005). The impact of in-school feeding on children will vary, depending on the initial nutritional status of the child. Data collection on these variables has been inconsistent. In addition, it is believed that the potential for catch-up growth among stunted children is limited after 2 years of age, particularly in poor environments.

2.7 Other Factors that affect UPE Pupils' Academic Performance

Specific pupil practices identified in research as contributing to learning included; going to school daily and working hard at writing and reading, keeping one's exercise book in good condition and reading all the lessons, playing good games, keeping good hygiene, and looking smart, being disciplined and attentive in class; and avoiding such actions as smoking, having sex, abusing teachers and the community on the way to and from school. These concrete, qualitative findings shift attention away from

secondary data, such as numbers of scholastic materials, including textbooks, available to what actually takes place in classrooms (Munene, 2008).

CHAPTER THREE - METHODOLOGY

3.0 Introduction

This chapter describes the procedures and methods that were used to collect data and the tools for analysis and interpretation of results of the study. Specifically the chapter describes the research design, target population, sample size and sampling procedures, data collection procedure and tools, and data analysis tools.

3.1 Research Design

The research largely employed a descriptive survey design to explore the perceived effects of short-term hunger on pupils' academic achievement in a quantitative manner. This design was chosen because it is time efficient, and this survey had to be done within a particular time frame. A descriptive survey also allows rapport establishment with the respondent. Acquisition of more in-depth information through interaction with the respondents and interviewee observation was done, and it led to obtaining visual cues of the effects of short term hunger on pupils' schooling.

3.2 Target Population

Generally, the study population was pupils in primary schools in Kamuli and Soroti districts. The target population comprised of primary five and primary six pupils in UPE schools in Kamuli and Soroti Districts. Pupils of primary five and six were targeted because they stayed at school for a whole day and therefore were more likely to express the effects of short term hunger. In addition, Teachers and head teachers of the sampled schools were also involved as key informants. They provided information related to the behaviors of pupils (target group) associated with short term hunger.

3.3 Sampling Procedure and Sample Size

This study was carried out in Kamuli and Soroti Districts. A multi-stage sampling procedure was applied from district to pupils. The two districts were purposively selected (pre-selected) by the bigger project in which this study was only part. The project targeted the two districts because of their relatively higher vulnerability to hunger incidences and being high risk areas in terms of food security which may have exacerbated impacts on short term hunger on schooling in UPE schools. In addition to this study, the bigger project also established school gardening projects in one rural school in each district to test the viability of school gardening concept as a learning laboratory and as a means of providing food for the school feeding program in UPE schools.

Figures 1 and 2 illustrate the sampling procedure for the schools and the pupils.

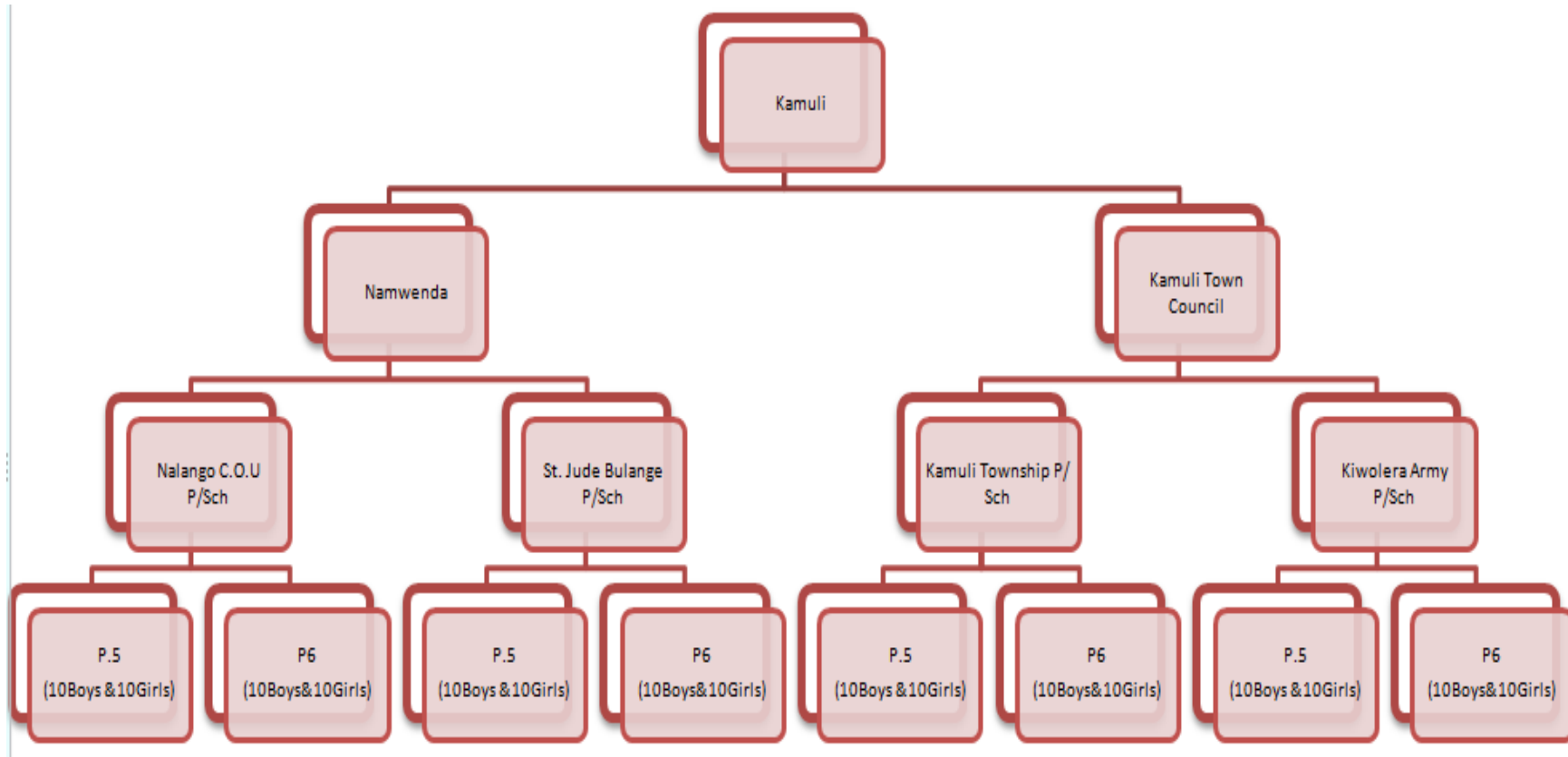


Figure 1: Sampling Procedure in Kamuli District

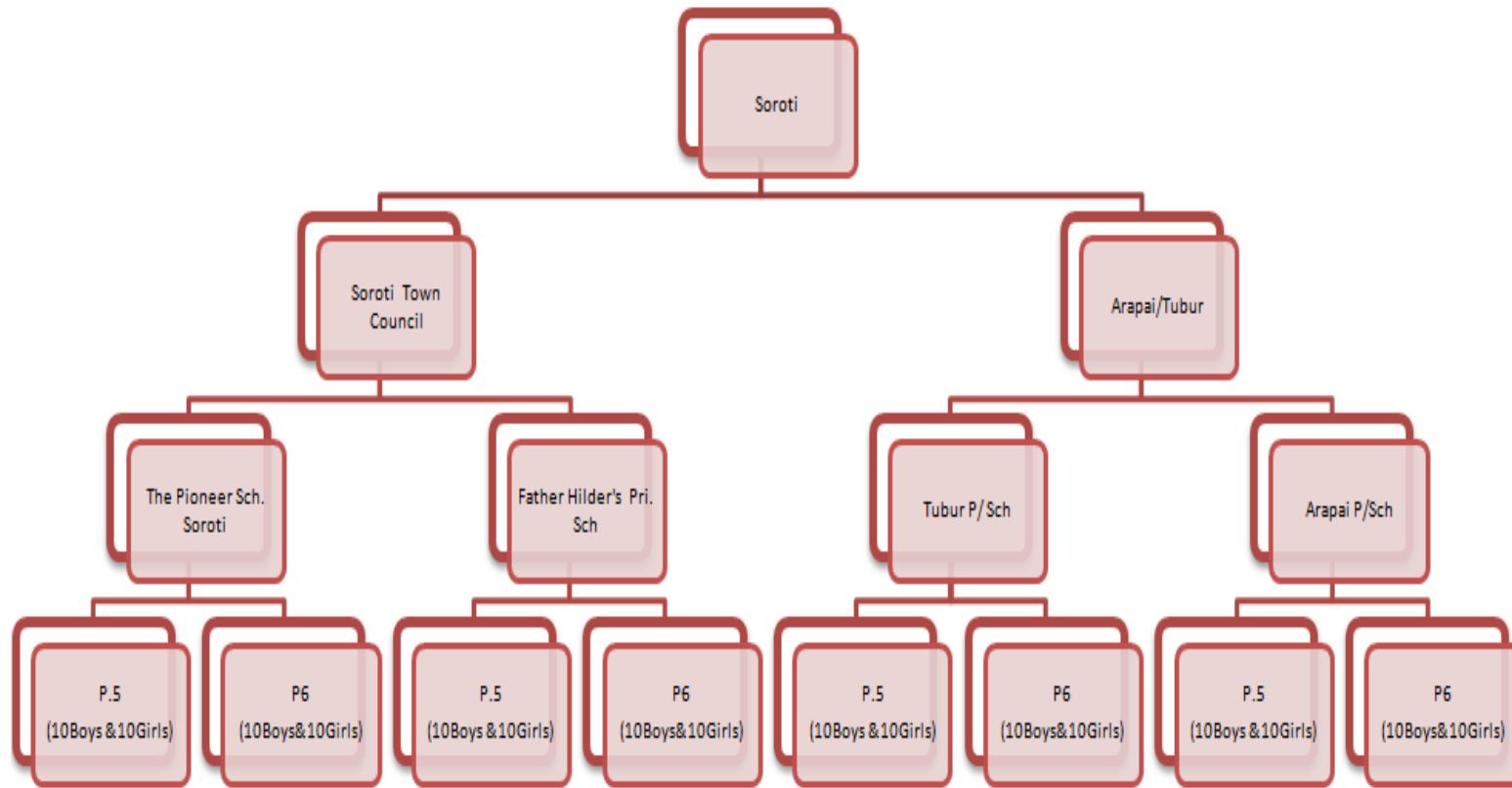


Figure 2: Sampling Procedure in Soroti District

Within each of the districts, two sub counties, one urban (peri-urban) and another rural were purposively selected for purposes of comparing if there were differences in dealing with short-term hunger. The sub-counties or municipality in which the district administration headquarters was situated were automatically selected as the urban sub-counties (Soroti town council in Soroti district and Kamuli town council in Kamuli district), while the sub-counties in which the school gardening activity was initiated were automatically selected as the rural sub-counties. In this regard, Tubur in Soroti district and Namwendwa in Kamuli district were selected as the rural Sub counties for this study.

A list of all UPE schools from Namwendwa, Kamuli town council, Soroti municipality and Tubur sub counties was obtained from the District Education Officer (DEO) as the sampling frame for the UPE schools. Six UPE schools were randomly selected using the lottery sampling method, where: all the different sub counties' schools were written on small and equal sized pieces of paper and put in a tin. This tin was tossed and pieces of paper, bearing the schools' names were picked randomly. A different tin was used for each district. This provided equal chances of selecting any of the schools to be involved in the study. Following this process, six schools from both Kamuli and Soroti Districts were selected. In addition, the schools where the school gardening initiative was established, that is Nalango primary school in Kamuli and Tubur primary school in Soroti were also considered for the survey and this made a total of eight schools, as outlined in the table 1.

Table 1: Schools Selected for the Survey

Schools	Kamuli District	Soroti District
Urban Primary schools	1. Kamuli Township 2. Kiwolera Army	1. The Pioneer School 2. Father Hilders
Rural Primary Schools	1. Nalango 2. St. Jude Bulange	1. Tubur 2. Arapai

Source: data from the survey, 2011

Within each of the schools, lists of pupils in primary five and primary six were obtained from the respective schools based on the school registers. Using stratified random sampling, the pupils in each class were divided into two strata based on gender, thus girls and boys. With the aid of a table of random numbers, ten pupils were randomly selected from each stratum making a total of 20 pupils per class and an overall sample size of 320 pupils from the eight schools as outlined in table 2 below.

Table 2: Total Number of Pupils in the two Classrooms in each School Sampled

District	Soroti District				Kamuli District			
	Tubur		Soroti Town Council		Kamuli Town Council		Namwendwa	
School Name	Tubur	Arapai	Father Hilder's	The Pioneer	Kiwolera Army	Kamuli Township	St Jude Bulange	Nalango
Pupils in P5	151	113	116	126	111	121	117	157
Pupils in P6	119	120	110	104	115	104	113	123
Total	270	233	226	230	226	225	230	280

Justification of the Sampling Size

The appropriate sample size was guided by Cochran's sample size formula (Cochran, W. G., 1977) stated as follows;

$$n_0 = (Z)^2 * (p)(q) / (d)^2$$

Where;

Z = value for selected alpha level of .025 in each tail = 1.96. (The alpha level of .05 indicates the level of risk the researcher is willing to take that true margin of error may exceed the acceptable margin of error).

p = (Maximum possible proportion (0.5)

q = 1-p maximum possible proportion (0.5) produces maximum possible sample size.

d = acceptable margin of error for proportion being estimated = .05 (error researcher is willing to except).

$$n_0 = (1.96)^2(0.5)(0.5) / (.05)^2$$

$$n_0 = 384$$

Therefore, since the total population of pupils in all the classes was 1,920, the required sample size was 384. However, since this sample size exceeded 5% of the population (1,920*.05=96), Cochran's (1977) correction formula was used to calculate the final sample size as follows:

$$n_1 = n_0 / (1 + n_0 / \text{Population})$$

Where

Population size (Total number of pupils in each of the classes) = 1,920

n_0 = required return sample size according to Cochran's formula = 384

n_1 = required return sample size because sample > 5% of population

$$n_1 = (384) / (1 + 384/1920) = 320$$

The procedures resulted in a minimum returned sample size of 320, which was used as this survey's sample size.

3.4 Data Collection Procedure and Tools

This research was cross sectional in nature. Questionnaires were administered individually by the researcher to the sampled pupils. The questionnaire captured information that was relevant to determining the perceived effects of short-term hunger on schooling. Information collected included; feeding patterns of pupils, symptoms of short term hunger, influence of the symptoms on pupils' attendance, learning and concentration and strategies used by pupils to cope with the challenge of short term hunger.

To complement the quantitative data generated by the questionnaires, qualitative data was collected to enable the researcher to put their interpretation in context and to offer more in-depth explanations that could not be done with figures alone. FGDs following a check list of questions were conducted with the teachers to gain more insight into the environment and the contextual factors related to short-term hunger at schools. The teachers also served to validate and complement the information given by pupils especially strategies used to cope with short-term hunger while at school. Observations of pupils' behaviors during lunch time and pictures were taken, to get a real first-hand experience of the issues generated in the interviews.

3.5 Data Analysis

Quantitative data analysis procedures were used to generate complementary and adequate explanations of the phenomenon of short-term hunger and its effects on schooling in UPE schools. The quantitative data generated through questionnaires

were entered into a spreadsheet and analyzed using the Statistical Package for Social Scientists (SPSS) computer program version 18. Descriptive statistics such as frequencies, percentages and means were computed to characterize the feeding patterns and correlations were performed to establish relationship between the perceived effects of short term hunger and pupils' attendance, learning and concentration.

Content analysis was done to describe the perceived effects of short-term hunger and the strategies used by pupils to cope with the same. The researcher came up with merging themes that were used to describe the effects, which were then entered in SPSS and analyzed using frequencies and percentages. Frequencies of these themes were got to understand which themes appeared more than the others throughout the study.

3.6 Validity and Reliability

Validity

To ensure validity, the questionnaire was tested in order to check its content, construct and face validity. Content validity refers to how well an instrument includes a representative sample of questions that relate to the content domain being measured (Patten, 2004; Wallen & Fraenkel, 2001), while Construct validity determined the nature of psychological construct or characteristics being measured by the instrument. Content and construct validity were ensured by experts, supervisors and peers from Makerere University who helped in the review to ensure the instrument accurately measured the variables it intended to measure in the study. Face validity dealt with format of the instrument and included aspects like clarity of printing, font size and

type, adequacy of workspace, and appropriateness of language among others this was ensured by peer review.

Reliability

Reliability indicates the degree to which a survey instrument is consistent with what it measures (Litwin, 1995). To ensure reliability, the instrument was pre-tested with a sample of 20 pupils in Nalango primary school, who were not necessarily included in the sample size. The number 20 was chosen for the pre-test because, according to Israel (2003), it is the smallest number that can yield meaningful results on data analysis in a survey study. Pre- test results showed that the questions were easily understood and answered in the same way by the sampled pupils, hence the instrument was reliable. The research methodology has been summarized in table 3.

Table 3: Specific objective, specific data required, source of data, method of data collection and method of data analysis

Specific Objective	Specific data required	Source of data	Method of data collection	Method of data analysis
1. Characterize the feeding patterns of pupils in UPE schools.	<ul style="list-style-type: none"> - Found out whether the pupils had the main meal; breakfast, lunch and super - Diversity of food eaten by pupils in their homes. - Methods by which breakfast and dinner were served - Characteristics of the school feeding programs - Challenges faced by the school feeding programs 	Sampled pupils	Questionnaire was administered directly to the pupils	Data was entered in SPSS. Frequencies, percentages and means were computed
2. Describe the perceived effects of short term hunger among pupils in UPE schools in Kamuli and Soroti districts.	Sensational feeling felt when the pupil is hungry	Sampled pupils	Questionnaire was administered directly to the pupils	<ul style="list-style-type: none"> - Merging themes were entered in SPSS and analysed using frequencies and percentages - A chi-square was run to see whether the sensational feelings are significantly different between boys and girls - A correlation was run to check whether hunger affected pupils in different districts, location, class and sex, differently. The effects of short-term hunger were used as dummies for hunger.
3. Describe strategies used by pupils to cope with the challenge of	What pupils did when they were hungry, to get something to eat	Sampled pupils	Questionnaire was administered directly to the pupils	Merging themes were entered in SPSS and analysed using frequencies and percentages

short term hunger.				
<p>Determine the relationship of the effects of short term hunger such as attendance and concentration on academic achievement of pupils in UPE schools in Kamuli and Soroti districts.</p>	<ul style="list-style-type: none"> - Average number of days a pupil attended class - Level of concentration both in the morning and in the afternoon - Average mark at end of term one. - Sensational feeling had when the pupil was hungry. 	<p>Sampled pupils</p>	<p>Questionnaire was administered directly to the pupils</p>	<ul style="list-style-type: none"> - Data was entered in SPSS. Mean marks at the end of term were computed between sex, district and location of the school, t-tests were run to check whether the marks were significantly different. - A correlation was run to check whether there was a relationship between concentration, attendance and academic achievement. - A correlation was run to check the relationship between hunger and schooling. The effects of short term hunger were the proxies for hunger while concentration, attendance and average marks were the proxies for schooling. - A correlation was run to check whether having lunch or not having lunch had an effect on pupils' concentration in class, attendance and average marks at the end of the term.

CHAPTER FOUR - RESULTS AND DISCUSSION

4.1 Socio-economic Characteristics of Pupil Respondents

The study involved 320 pupils drawn from eight Universal Primary Schools in Kamuli and Soroti districts. The social characteristics of the pupils are described to provide the background and context for discussion of the results of this study. The characteristics described include, age, family characteristics, housing and occupation of the household head. Table 4 presents the age and family characteristics of the sample.

Table 4: Social Characteristics of pupils

Characteristic	Mean per Sex			Mean per District	
	Female (n=160)	Male (n=160)	T-Value	Kamuli (n=160)	Soroti (n=160)
Age (Years)	12.7	13	-0.246 (NS)	12.8	12.8
Average Family Size	-	-		8	8
Average Number of School Going Children per family	-	-		4	4

Source: data from the survey, 2011 NS=not significant at a less than 0.05 alpha level

On average, the boys were slightly older than the girls, 13 and 12.7 years old respectively. An independent t-test indicates that the age difference between boys and girls was not significant ($P>0.05$). In both districts, the mean age of the pupils was the same (12.8 years). Similarly the family characteristics in terms of average family size and number of school going children per family were the same in the two study districts. It is however important to note that in both districts, half of the families are

school going children. This poses a challenge on the capacity of the households to pack food for the children to take to school as expected. The challenge is in terms of; availability of adequate food and packaging of the food to the school going children, and at the same time providing food to the other family members that remain at home.

The type of housing for the households where the pupils come from can be indicative of the socio-economic status of the household which in turn has implications on the capacity to provide the basic needs to the pupils. This study sought information that describes the housing where the pupils lived. Table 5 provides the features describing the houses of the families where the pupils live.

Table 5: Housing characteristics of the pupils' homes

Features of main house		Kamuli (%) (n=160)	Soroti (%) (n=160)
Wall materials	Roofing materials		
Mud and wattle	Grass thatch	5.3	38.4
Wood and mud	Iron roofed	7.2	8.5
Bricks and cement	Iron roofed	87.5	53.1

Source: data from the survey, 2011

There is a cultural difference among the districts with regard to housing. Culturally, people in Soroti district are more associated with grass thatched housing than those in Kamuli though the current trend in Soroti district is to shift to iron roofed housing when socio-economic status improves.

With respect to housing as an indicator, there was a difference in the standard of living of the pupils in Kamuli and Soroti districts. Most (87.5 %) of the pupils in

Kamuli lived in houses made of brick and cement and iron roof as compared to 53.1% from Soroti. Conversely, 38.4% of the pupils in Soroti lived in houses made of mud and wattle and grass thatch compared to 5.3% in Kamuli. Wood and mud houses are temporary, and are an indicator of low standards of living. With this, there is a possibility that such families cannot afford to have their children get all the basic meals; that is: breakfast, lunch and dinner. In addition to type of housing as an indicator of socio-economic status, information on the occupation of household heads was gathered from the pupils. Table 6 presents the occupation of the Head of household where the pupils come from.

Table 6: Occupations of the Respondents' House Hold Heads

Occupation	District	
	Kamuli (%) (n=160)	Soroti (%) (n=160)
Farmer	66.3	61.2
Business	60.0	64.4
No gainful occupation – stay home	31.8	50.0
Civil Service employees (Teachers, health workers, engineers)	9.35	11.3

Source: data from the survey, 2011

In Kamuli, 81.2% were male headed household while, 18.8% were female headed; in Soroti, 78.1% were male headed while 21.9% were female headed households. Some of the household heads had multiple sources of livelihoods, i.e. the information presented in Table 4.3 above is a multiple response type. The majority (66.3%) of house hold heads in Kamuli and (61.2%) in Soroti engaged in farming as a source of livelihood. Nearly similar proportion (64.4%) in Soroti and (60%) in Kamuli was also

engaged in some form of business e.g. transporting people on motor cycles (*Bodaboda*) and selling merchandise (shoes, clothes, plastics, food stuffs and hair dressing) in markets. A fairly large proportion of pupils, 50% in Soroti and 31.8% in Kamuli described their household heads as not being involved in gainful occupation – they just stay home, though on further probing, it emerged that they were involved in small scale subsistence agriculture. The perception of “not engaged in any gainful employment” may be associated with being able to generate income from their engagements. This phenomenon was more reported in Soroti and among male headed households. There is higher tendency for men in Soroti to idle around trading centers as early as morning, and this was noticed during the data collection process.

Occupation of the household heads in this case is not only an indicator of socio-economic status but also carries a sense of responsibility that influences the parent capacity and/or behavior to provide food for the school going children. Further, this could also have an influence on the overall feeding patterns of the children and quality of food provided to the children. The next section discusses the feeding patterns of the pupils where school feeding is only part.

4.2 Diversity of Foods Consumed by the Pupils

This section outlines the range of foods that pupils largely consumed at home. The foods ranged from root tubers, cereals, legumes, vegetables, meat and plantain. Table 7 shows the different types of food that were consumed by the pupils in their homes.

Table 7: Foods Consumed by Pupils in their Homes

Type of food most consumed	Percentage Responses in Kamuli (n=160)	Percentage Responses in Soroti (n=160)
Sweet Potatoes	73	61
Cassava	20	28
Posho (maize meal)	71	46
Rice	23	31
Plantain	15	2
Millet	0	28
Beans	60	77
Meat	32	51
Vegetables	83	50
Groundnuts	25	20

Source: data from the survey, 2011

At least 54.9% of the pupils whose schools were located in the rural sub county indicated that nearly all the food consumed was produced by the household. Such foods included: sweet potatoes, cassava and maize. Whereas it is believed that rural households produce most of their food requirements, 45.1% of the pupils reported that the food consumed was bought. Food usually bought included rice, plantain, maize flour, beans, ground nuts and meat. Survey results further revealed showed that the majority of the urban households (61.9%) bought their food. Though this is the case, the increasing food prices coupled with high levels of poverty makes it more difficult for such household to meet their essential food needs. Results in the table also indicate that rural households are more likely to depend on foodstuffs produced by the household, most of which are carbohydrates. Under the circumstances, the pupils are

more likely to be deprived of the more needed proteins, hence affecting full development of their potential including the mental abilities.

4.2.3 Mechanisms of Food Sharing in Pupils' Homes in Kamuli and Soroti

In a typical household (both in Kamuli and Soroti districts) three meals are expected; breakfast, lunch and dinner. However, the pupils indicated that they usually had only two meals at their home, which are breakfast and dinner. Meals were served using different methods which included: rationing, self service and communal feeding (see table 8)

Table 8: Methods by which breakfast and dinner were served

Serving Method	Urban Location		Rural Location	
	Breakfast	Dinner	Breakfast	Dinner
Rationing	70.1	58.2	71.6	50.6
Self Service	14.0	7.6	15.6	1.9
Central Place	15.9	34.2	12.8	47.5

Source: data from the survey, 2011

Rationing was reported as the main serving method used both in the rural and urban settings. This was so because the food would not be adequate for all the family members if each one were allowed to serve enough for oneself. This therefore forced the parents to ration the available food to ensure that everyone got a fair share. Results in the table further revealed that people, mainly in the rural areas still regarded meal time as a social event that promotes good family relationships (17.7%), and that is why food is served in a central place (47.5%) for all family members to eat at the same time (communal feeding). Further still, some (7.3%) families have a large family size and with inadequate number of plates, eating from eat from a central place

because it is the only feasible method of food sharing. It is also interesting to note that 27.8% of the respondents confessed not knowing why they were served food the way they were served, since they grew up being served using particular serving methods.

4.3 Pupils who had Main Meals

Feeding has been acknowledged as the greatest bottleneck to both children's access and benefit to education for the few who manage to get to school (Jukes, *et al.*, 2008). For effective learning at school, a child should have three main meals daily including; breakfast, lunch and dinner (see figure 3).

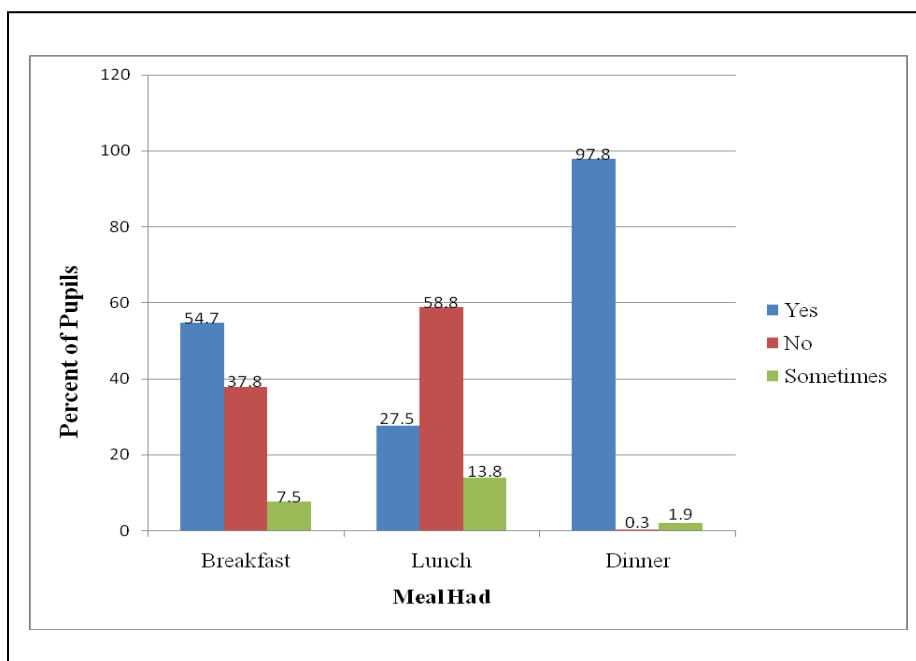


Figure 3: Percentage of Pupils who have Breakfast, Lunch and Dinner

A large proportion 37.8% who did not have breakfast is likely to lose concentration and attention in the morning. This is confirmed by the Dairy Council of California (2009) that states that; children who skip breakfast have trouble concentrating at school and become inattentive and restless by late morning. In this study, only 54.7%

indicated having breakfast before going to school. The situation is further aggravated if the same pupils do not eat lunch while at school. It is evident that the above is true since 58.8% of the pupils confessed not having anything to eat for lunch. There is thus a high (61.4%) likelihood that the pupils who miss breakfast also miss lunch and resulting into short term hunger. The resultant short term hunger inevitably will affect the level of learning and concentration when the pupils return to classroom for the afternoon sessions. This is a serious hindrance to learning as Birdsall *et al.* (2005) warns that hunger affects cognitive functions and may therefore impair a child's ability to benefit from schooling.

It is also important to note that a large majority (97.8%) of the pupils reported that they had dinner at home, before going to bed, though 2.2% reported that they never did so. Having a meal is one thing but whether the pupils feel satisfied with the meals they have is another. Of those who had meals, 39.1% of them confess not to get satisfied indicating inadequate food intake in terms of quantity. As earlier revealed that the pupils largely depend on carbohydrates, it is unfortunate that they do not get enough of them, a recipe for malnutrition. However, 60.9% said they got satisfied – at least the quantity suffices though the quality may be wanting. With these findings, it is clear that the effects of scrapping of the mandatory school feeding programs in UPE schools have serious negative impacts of the pupils' learning abilities. The Government assumption that parents would be able to provide food for their children while at school is not realistic. New interventions are required to address the critical issue of school feeding in UPE schools.

4.3.1 Characteristics of the School Feeding Program in UPE Schools

School feeding programs serve as a magnet to attract and retain children in school, and to improve their ability to learn. School feeding programs are also among the most effective tools to increasing access to education and alleviating short term hunger (Levinger, 2005 and Janke, 2001). This study sought to describe the school feeding programs from the sampled UPE schools in Kamuli and Soroti districts. Six out of the eight sampled schools had arrangements for providing lunch with the contribution of parents in both districts. Under this arrangement, parents were expected to contribute food ingredients and some money to process the food and meet the cost of preparing the meals. The pupils also provided some labor in the preparation and serving of the meals.

For both urban and rural schools in Kamuli, parents were required to contribute two kilograms of dry maize grains and Sh. 2000/= per child per term. In Soroti, the rural schools required parents to contribute a basin (approximately six kilograms) of dried sweet potato chips (*amukeke*) and Sh. 1,500/=. In Soroti urban schools however, parents contributed three kilograms of dry maize grain and 3,000/= per child per term. Not all parents could meet these requirements. Some parents would contribute either the materials foodstuff (maize, *amukeke*) or money, and some none at all. The pupils whose parents did not contribute were not entitled to meals at school. It was optional that some pupils could pack and carry their food to school. A discussion with the teachers revealed that while maize and sweet potatoes were the main staple foods in Kamuli and Soroti respectively, some families did not have enough and so would not spare any to contribute towards the school feeding program. While the amount of food and money appears small per child, it turns out to be a substantial amount given

the number of children going to school from each family. As earlier revealed by this study, each household had four school going children and this would mean eight kilograms of maize and Sh. 8000 per household in Kamuli (both urban and rural sub counties) and four basins (approximately 24 kilograms) of *amukeke* and Sh. 6,000 per household in rural sub counties, while 12kgs of maize and sh. 12,000 per household in urban sub counties in Soroti district. Many households could not afford this.

The cash contribution catered for paying the cook, milling the maize (where applicable), buying some plates, and firewood. In both districts, pupils participated for example in. serving the meals, fetching firewood and water. In all schools that had school feeding programs, the teachers' roles included: ensuring that pupils are served in an orderly manner, hence preventing them from struggling for food (52.6%), screening those who paid for and are entitled to feeding at school (42.9%), and ensuring that food is cooked on time (4.5%).

Parents' contribution towards the school feeding program was limited, especially in Soroti (7%), unlike in Kamuli (46%). This acted as an indicator that school feeding programs in Soroti, though well planned and written on paper, could be redundant and nonfunctional. For the pupils (73.8%) whose parents could not fulfill the requirements for the school feeding programs, several reasons were advanced as outlined in Table 9.

Table 9: Reasons for not participating in the school feeding program

Reason	Percentage (n= 236)
Parents could not afford to pay money	72
Parents could not contribute required food	23.2
Pupils did not have interest in school food	3.2
Family members going to school were many	1.6

Source: data from the survey, 2011

Affordability and lack of enough food in the households were the main reasons parents did not participate in the school feeding program. Parents who could not afford to contribute to the school feeding program had the option of packing food for their own children. However, this study reveals that only 2.2% of the pupils had ever packed food to school. Further still, the few who packed reported that the materials used for packing food were not appropriate. The food was carried in polythene bags (0.9%), plastic food containers (0.9%) and school uniform pockets (0.3%). It was also unlikely that food packed from home in the morning, would be uncontaminated by lunch time. Pupils listed challenges associated with the practice as presented in table 10.

Table 10: Challenges faced in packing food from home for school feeding

Challenge	Percentage (n=320)
Food going bad or getting contaminated	38.5
Food getting cold	12.8
Difficulties in finding packaging materials	25.5
Lack of enough food at home	10.3
Theft from other children	10.3
Loss of concentration in class as pupils keep thinking about their packed food	2.6

Source: data from the survey, 2011

Most of the challenges listed in Table 4.6 relate to the concern for food safety. The food goes bad, is contaminated or gets too cold due to inappropriate storage conditions. Many parents cannot afford proper food containers for hygienic storage of the food but even more serious is the lack of food at home to pack. In such situation, it is inevitable that pupils steal food from each other, a situation that diverts their attention in class as they either worry about their packed food and or develop anxiety to eat it even before lunch time. Whereas the school feeding program enables the pupils to focus and concentrate on their learning, several challenges were expressed with the current school feeding programs in the sampled schools. These are discussed in the next section.

4.4 Challenges associated with the School Feeding Program in UPE Schools

Although 75% of the schools had school feeding programs to curb the problem of short term hunger, these programs faced a number of challenges shown in table 11 that eventually reduced their efficiency.

Table 11: Challenges of the school feeding program in UPE schools as perceived by the pupils

Challenge Faced	Percentage (n=320)
Food not being enough even for the pupils who paid	36.3
Pupils struggling for porridge/food and sometimes getting injuries	40.7
Plates are not enough and not properly cleaned for re-use	16
Porridge/food is not cooked well	5.5
When the cook is absent, meals are missed	4.4

Source: data from the survey, 2011

The challenges listed in Table 11 still raised concerns of adequacy of food and food safety and other physical risks. Specifically;

- a) Porridge/food not being enough even for the pupils who paid for school feeding because to start with, the quantities contributed by the parents were rather small. Taking into account the advantage of bulking, two kilograms of maize are rather on the lower side to feed a child for a term that lasts about three months. Further, this was also shared with the teachers and overall, the quantities served to the pupils were inadequate. Sometimes the pupils, who were entitled to feeding, missed the meal and still went hungry. Even those who got the meal still remained hungry (partially) due to inadequate quantities served.
- b) Pupils struggled in the queue to have a school meal. When pupils are hungry, they become aggressive. Some of them do not want to stand in a queue, since this is viewed as a delay. This eventually leads to the stronger pupils being served food before the weaker ones. With insufficient food volumes, the

weaker pupils remain hungry for the rest of the afternoon. Worse still, while they struggle, some of them get burnt by the food, especially porridge.

- c) Plates in most of the schools are not enough for the number of pupils who paid to have meals at school. Pupils therefore have to wait and eat food in turns. In so doing, a lot of time is wasted, since the pupils who have not yet been served look for friends who have finished eating, wash their plates, and then get back on the line. This in the long run wastes time that would be used for attending lessons in the afternoon.

With the above mentioned challenges concerning the school feeding program, it was evident, though to varying degrees, that pupils suffered short term hunger during their stay at school, whether they participated in the school feeding program or not. The effects are worse for those who do not participate in the school feeding program and do not pack food, but even those involved in the school feeding program do not get enough food. This study then attempted to get effects of short-term hunger as perceived by the pupils. The next section focuses on how pupils experience short term hunger, and its gender-based affects.

4.5 Perception of Short term Hunger as experienced by the pupils

Pupils experienced short term hunger each in a different way. Table 12 below shows the sensational feeling reported by both boys and girls.

Table 12: Symptoms of Short-term Hunger

Sensational feeling	Stratification by Sex		P- Value of χ^2 test
	Female (%) (n=160)	Male (%) (n=160)	
Stomach ache	51	49	0.368(NS)
Head ache	54	46	0.368(NS)
Fever	22	78	0.040*
General body weakness	49	51	0.368(NS)
Yawning all the time	33	67	0.267(NS)
Gets angry	50	50	-
Temporal blindness	80	20	0.019*
Dizziness	55	45	0.368(NS)

Source: data from the survey, 2011, NS=not significant, *=significant at 5%

Survey results indicated that 51% of the girls suffered from a stomach ache when they felt hungry, and 49% of the boys suffered the same, however, there was no significant difference between the responses of both boys and girls, implying that the effect on both was almost similar. In addition, 80% of the females reported temporal blindness when they felt hungry, while only 20% of the males reported the same. A chi square test was run, and it was found out that there is a significant difference between the number of girls and boys who suffered from temporary blindness. The male were more (78%) affected by fever, than the female (22%), chi square test also showed a significant difference. An equal number (50%) of boys and girls got angry when they felt hungry. The male yawned more (67%) when they got hungry, although chi square results showed no significant difference from the girls.

The feeling of short term hunger as expressed by the pupils indicated a health discomfort that invariably reduces their concentration and learning. It is difficult to dissociate the effects of short term hunger from disease. Generally the feeling of pain, body weakness, dizziness affect the physical and mental performance of the pupils and consequently it leads to lower achievement in school and often dropping-out of school. In addition, instead of the pupils concentrating on their studies while at school, as early as morning, most of the pupils are already distracted by the fact that in a short while they will be feeling hungry. A correlation was then run, to determine whether there was a significant relationship between short term hunger and sex, district, location and class of the respondents. This is shown in table 13 below.

Table 13: Relationship between effects of short term hunger and pupils' sex, district, location and class

	Sex	District	Location	Class
Stomach ache	0.690	0.032*	0.525	0.475
Headache	0.087	0.367	0.021*	0.499
Fever	0.538	0.742	0.983	0.742
Body weakness	0.439	0.025*	0.404	0.180
Yawning	0.096	0.397	0.389	0.204
Angry	0.157	0.003**	0.017*	0.558
Temporal blindness	0.792	0.002**	0.488	0.479
Dizziness	0.660	0.001**	0.833	0.902

Source: data from the survey, 2011 * = Correlation is significant at the 0.05 level, ** = Correlation is significant at the 0.01 level

The sensational feelings indicated in table 13 were used as dummies for short term hunger. From the survey, we realize that hunger affects pupils in the same way irrespective of their sex and class. However, there was a significant difference between how the pupils of Kamuli and Soroti felt when they were hungry, especially stomach ache, body weakness, getting angry, temporal blindness and dizziness. In addition, between the rural and urban location, feeling headache and getting angry were significantly different. These pupils did not feel exactly the same way, when they suffered the mentioned symptoms. The pupils then devised means of coping with the challenge of short term hunger, which are discussed in section 4.6.

4.6 Strategies for coping with short term hunger

Pupils have various ways of coping with short term hunger at school. Table 14 presents some of the coping strategies.

Table 14: Strategies used by pupils to cope with short term hunger

Strategy	Percentage (n=320)
No alternative ways to get food	36.8
Looking for fruits around the village	28.0
Begs from friends who have	18.5
Escapes from school and goes back home	9.0
Buys a snack	7.7

Source: data from the survey, 2011

Twenty eight percent of the pupils go looking for some fruits in the neighbourhood of the school. These fruits include: jackfruit, sugarcane, mangoes, oranges, guavas and tangerine. However, these fruits are seasonal, and when not in season, this option is

not available. Whereas some of the fruits in the rural areas are regarded as communal, increasing commercial value of the fruits is eroding this practice creating a situation where such children just steal the fruits. This is not only undesirable behaviour, it is also criminal and the owners of those fruits may arrest the pupils, a situation which also creates conflict between the schools and their neighbourhoods.

Only a few pupils (7.7%) were reported to be able to occasionally buy some snacks at school. Some parents can afford to give their children some little money (about Sh. 100/=) a day to buy a snack at lunch time though this may not be on a daily basis. The communities around the school take the opportunity to sell some snacks such as pancakes, roasted cassava, roasted potatoes, cakes, popcorn, *namungodi* and *mondi* to the pupils who can afford. A little snack with some water takes the pupil through the day.

Further still, 18.5% of the pupils who have no access to food beg from their friends who have. The friends were usually generous enough to share the little they had. Other pupils escape from school (9%) and go to do several tasks to generate income to buy snacks at school. Tasks include; brewing alcohol from sugar cane and providing casual labour in the industrial area. The girls end up having sexual relations with *Bodaboda (motor cyclists)* businessmen who give them some money, which they use to buy something to eat. A good number of pupils (36.8%) have no alternative ways to getting food. They either go to play, sleep under a tree or persevere until the time when they go back home in the evening, and eat whatever is available. Most of these strategies are planned prior to lunch time, which therefore shows that instead of

the pupils actively and attentively attending class, their minds are already swayed by thoughts of how to cope with short term hunger come lunch time.

With the prior discussed coping strategies, it is inevitable that the pupils are negatively affected. Survey results therefore showed the influence of short-term hunger on pupils' learning, attendance and concentration, which are discussed in section 4.7.

4.7 Effects of short term hunger on pupils' learning

Learning is definitely affected by short term hunger. Birdsall, *et al.*, (2005) explains that; children who suffer short term hunger often lack the micronutrients and energy required for normal development, critical to their learning once in school. The pupils involved in this study listed the various ways in which hunger affected their learning (Table 15).

Table 15: Ways in which hunger affects learning

Effect	Percentage (n=320)
Loss of concentration	42
Reduced understanding of subject matter delivered by teacher	41
Reduced attention and dosing in class	32
Absenteeism	8

Source: data from the survey, 2011

The pupils explained that the short-term hunger experienced while at school severely reduces their concentration and understanding of the subject matter delivered by the teachers especially in the afternoons. The discomfort created by hunger creates

divided mind between thinking about food and paying attention in class. They confessed that in many cases, they are unable to understand the subject matter. Sometimes they are simply dozing or frequently asking for permission to go out of class pretending to be going to the toilet or are absent because they could not bear the hunger. Ultimately their academic achievement in terms of grades is affected. Table 16 presents the grades of pupils who were involved in the survey at the end of term one of the year 2011.

Table 16: Pupils' Average Marks at the end of Term one 2011 with Respect to Sex, District and Location

		Average mark scored by Primary Five pupils (Percent). n=160	Average mark scored by Primary Six pupils (Percent). n=160
Sex	Girls	28.9	27.5
	Boys	25.6	29.4
	T-Value	0.82 (NS)	0.43 (NS)
District	Kamuli	32.6	34.8
	Soroti	21.9	22.2
	T-Value	0.00*	0.00*
Location of School	Urban	27.7	30.3
	Rural	26.7	26.6
	T-Value	0.60 (NS)	0.11 (NS)

*Source: data from the survey, 2011, * = Significant at a less than 0.05 alpha level, NS = not significant*

The general performance of pupils, both girls and boys in both districts and location of schools, were very low. Their average scores were below the 40% pass mark as prescribed by the Uganda National Examinations Board (UNEB, 2011). Whereas it is

acknowledged that many factors contribute to this poor performance, short-term hunger is one of the key ones. Munene (2008) points out other factors that contribute to the low grades. These factors include: quality of teachers, availability of scholastic and learning materials, working hard at writing and reading, keeping one's exercise book in good condition, reading all the lessons, playing good games, keeping good hygiene, looking smart, being disciplined and attentive in class; and avoiding such actions as smoking, having sex, abusing teachers and the community on the way to and from school. The differences in performance between girls and boys and between location of schools were not significant at ($P < 0.05$) implying that the differences observed in the scores presented are largely based on chance. However, performance between districts was significantly different ($P < 0.05$). Pupils in Kamuli district performed better than pupils in Soroti district. Poor performance in Soroti could be attributed but not limited to the rampant lack of feeding at lunch time, which increases pupils' loss of concentration in class and absenteeism from school.

Further analysis was made to find out whether there is a significant relationship between hunger and pupils' schooling. The effects of short term hunger were used as proxies for hunger, while concentration in class, attendance and marks attained at the end of term one were used as proxies for schooling. The correlation run did not test a cause effect relationship, but showed that effects on schooling are highly predictable from short term hunger. Table 17 shows the relationship between hunger and schooling.

Table 17: Relationship between hunger and schooling

	Concentration	Attendance	Marks
Stomach ache	0.979	0.446	0.183
Headache	0.447	0.988	0.934
Fever	0.809	0.694	0.374
Body weakness	0.316	0.623	0.058
Yawning	0.613	0.562	0.101
Angry	0.000**	0.579	0.474
Blindness	0.734	0.269	0.123
Dizziness	0.194	0.289	0.456

*Source: data from the survey, 2011 ** = Correlation is significant at the 0.01 level*

There was a significant relationship between anger and concentration in class. This was so because when the pupils got hungry, they became very angry and unable to concentrate in class. Generally speaking, the rest of the proxies for hunger were not significantly related to schooling. This was so because as earlier mentioned, these symptoms could not be clearly differentiated from ailment by the pupils. It was hard for them to isolate hunger and sickness.

4.8 Effect of Concentration and Attendance on pupils' academic achievement

As discussed above, generally short term hunger affects pupils through reduced concentration due to multiple effects and interrupted attendance as the pupils attempt to avoid the severe effects of hunger. To further explore these effects on academic achievement, attendance and concentration level were tracked for one month from 14th March to 8th April 2011 during their first term. The class teachers of each class recorded concentration by marking each pupil's concentration level following a likert

scale (1=poor, 2= low, 3= Good, 4= Excellent) both in the morning and in the afternoon, while attendance was recorded by taking roll calls in the morning and afternoon of each day. These were correlated with the average mark at the end of the term to establish the relationship between concentration, attendance and scores. The results of the correlation are presented in Table18.

Table 18: A Relationship between the Pupils’ School Attendance, Concentration level and academic achievement

Attendance and Concentration	Average mark at the end of first term 2011 (n=320)
Average number of days attended in the morning	0.175**
Average number of days attended in the afternoon	0.217**
Average level of concentration in the morning	0.083
Average level of concentration in the afternoon	0.193**

*Coef=Pearson correlation coefficient, Sig= Significance (2-tailed), ** = Correlation is significant at the 0.01 level*

There was a significant relationship between the number of days attended (morning and afternoon), concentration in the afternoon and the grades at the end of term. As earlier discussed, short term hunger reduced pupils attendance and concentration and these two factors have a significant relationship with the academic achievement. Both morning and afternoon attendance were significant because different content (subject matter) is delivered at those times all of which is examinable. This also implies that for pupils who attend in the morning and miss classes in the afternoon due to hunger are more likely to perform poorer than those who attend the whole day. Provision of food at school is a key factor for attracting and retaining pupils at school for the whole day. Without it, the effects will be reflected in poorer academic performance. In

Nalango where a school gardening project was initiated, the maize produced by the agricultural clubs was used to provide porridge to all the children in the school for two weeks. In those weeks when porridge was served to all the pupils, the teachers reported almost 100% attendance for those weeks. If this could be sustained, it is likely to greatly improve the pupils' academic achievement. Studies done by Levinger, 2005 and Tomlinson, 2007 also made it clear that school feeding programs increased enrollment and attendance in school.

Unlike for attendance, concentration in the morning did not have a significant relationship with the final grades at the end of term presumably because most of the children tend to have fairly good concentration in the morning. However, this concentration is very much reduced in the afternoon if they do not have lunch and this explains why concentration in the afternoon had a significant relationship with the final grades at the end of term. One of the pupils was quoted asking a friend early in the morning: "*Don't you think today we are going to get so hungry?*" This child had already suspected that they were going to feel hungry since the day's activities seemed more than usual, so she was sharing her mind with a friend, so that they devise means of how to cope with the short term hunger. The means devised usually compromised their attendance to school, hence grades at the end of the term.

Further analysis was done to find out whether there was a relationship between having lunch and concentration in class, attendance in school and marks attained at the end of the term. The results of the correlation are presented in table 19.

Table 19: Relationship between having lunch and schooling

	Significance
Concentration in class	0.024*
Number of days the pupil attended school	0.049*
Average marks at the end of the term	0.001**

*Source: data from the survey, 2011 * = Correlation is significant at the 0.05 level, ** = Correlation is significant at the 0.01 level*

Survey results showed that there was a significant relationship between having lunch and concentrating in class, attending school and average marks at the end of the term. When pupils had lunch, they concentrated more in class and attended school for more days, which in turn reflected in their grades at the end of the term.

CHAPTER FIVE - CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

Short term hunger is real and it exists among UPE School going pupils in Kamuli and Soroti districts. In addition, not all the parents are in position to adequately feed their children even at home, since they do not have enough food, due to the recent food shortages. When these children are inadequately fed, they do not get satisfied. They therefore report to school early in the morning while hungry.

Although some schools have come up with school feeding programs as means of curbing short term hunger, most of the parents are not willing to participate. This leaves the helpless children suffering from short term hunger while at school. The children have therefore come up with their own means of coping with short term hunger, which in the long run may be harmful to them and the society. For example the girls who have sexual relationships with *Bodaboda* men to earn money in order to buy food may end up getting early and unwanted pregnancies, and eventually dropping out of school. Pupils' looking for fruits around the village is a habit that slowly nurtures theft, since these pupils do not go to their own gardens at home, but instead go and steal from other people's gardens.

Short term hunger negatively affects pupils' learning, and this was noted in the end of term grades. Factors such as concentration in the afternoon and attendance to school (both morning and afternoon) significantly affected pupils' grades, this in turn hampering the sole reason as to why UPE was established.

5.2 Recommendations

- Despite the fact that UPE is free and there is no mandatory fee that has to be paid to the school, there is need to sensitise communities, parents inclusive, on the effects of short term hunger on pupils learning. Parents who take their children to schools that have a school feeding program should be enthusiastic enough to participate in the program, since it directly benefits their children.
- At schools where there are no feeding programs, parents and teachers should be encouraged to introduce them. Parents and teachers associations have a huge role to play here in looking after the welfare of their children and their children's education.
- The media should be involved in creating awareness of researched findings of the effects of short term hunger on pupils' schooling. Stakeholders such as district administrators, School Management Committees, Parents/Teachers Associations, school administrative staff should all be sensitised and be given the capacity to sensitise the rest of the communities.
- Schools that have land should adopt the culture of teaching the pupils how to grow their own food by initiating school gardens. This will enable the pupils not only alleviate short term hunger while at school, but also learn practical agricultural skills that they can use in the future.

5.3 Suggestion for Further Research

A case study research should be carried out, since one may not necessarily understand what the pupils exactly feel, and how they behave when they suffer short term hunger, unless they live in these communities and have further interactions with the affected pupils for some time and at a deeper level.

This research examined effects of short term hunger on schooling among pupils in the Eastern region only, and particularly in Kamuli and Soroti districts. Differences may exist across regions and districts. Further research should therefore be carried out in other regions, if the results are to be generalised for all UPE school going children in Uganda at large.

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APPENDICES

Appendix 1: Questionnaire

PUPILS' SURVEY QUESTIONNAIRE

EFFECTS OF SHORT-TERM HUNGER ON SCHOOLING AMONG UNIVERSAL PRIMARY SCHOOLS IN KAMULI AND SOROTI DISTRICTS, UGANDA

Introduction: Dear Sir/Madam, I am a student from Makerere University, Faculty of Agriculture. As part of the requirements of the University I am required to undertake research as a fulfillment for graduation. I am carrying out a study titled "Effects of short term hunger on schooling among UPE School going children". I would then request you to spare some time and respond to the following questions and confidentiality is highly assured. Thank you for being cooperative.

Section A: Identification

Date of Interview: (Dd/Mm/Year) **SURDATE** ____/____/____

Respondent Name; First name: _____ Last name: _____

1. District: _____ **DIST:** _____

2. Name of School: _____ **SCH:** _____

3. Is the school **Urban or Rural?** (1=Urban; 2=Rural) **LOCTN:** _____

Supervisor: First name _____ Last name _____ **SUPCODE** _____

Enumerator: First name _____ Last name _____ **ENCODE** _____

Date checked: (Dd/Mm/Year) **CHDATE** ____/____/____

Data entry:

Date entered: (Dd/Mm/Yr) **ENTDATE** ____/____/____

Section B: Characteristics of Respondent.

4. Class (**CLSS**) _____ (5=P5; 6=P6)
5. Sex (**SX**) _____ (1= Female; 2= Male)
6. Age (**AGE**) _____ (Years)
7. Number of people in your household (**HHNO**) _____
8. Number of people that go to school (**SCHNO**) _____
9. Household Head (**HHHD**) _____ (1= Father; 2= Mother; 3= Sibling; 4= Grandparent; 5= Uncle; 6= Auntie)

Section C: Major Kinds of Food consumed at home, and the source of the food.

10. What kind of food and sauce do you usually eat at home, and where do you get it from?

Kind of food consumed at home FDCONS	Sauce SAUC	Source of food		
		SOCE		
		SOCE 1	SOCE 2	SOCE 3
1.				
2.				
3.				
4.				

Source of food (1= grown; 2= bought; 3= barter trade; 4= donations)

11. Which of these meals do you have?

Breakfast (BKFST)	Lunch (LNCH)	Super (SUPR)	Other

(0= no; 1= yes; 2= sometimes)

12. Which types of food do you eat most of the time during the following meals?

(Indicate; not applicable- N/A when meals are not had)

Meal	Food eaten		Sources (SOCE)	Level of Satisfaction (SATIS)	Place where food is eaten (WHER)
	Food (FD)	Composition (COMP)			
Breakfast	1.				
	2.				
	3.				
Lunch	1.				
	2.				
	3.				
Super	1.				
	2.				
	3.				

Satisfied = (1= very poor; 2= poor; 3= fair; 4= good; 5= very good)

Sources = (1=Home/pack from home; 2= School meal; 3= Buy from a food vendor)

Food eaten = (1= most common; 2= Second; 3= third)

Where food is eaten = (1= home; 2= school; 3= neighbor)

13. If food is packed from home for lunch, how is the food packed?

.....
.....
.....

14. What challenges do you face in packing food from home?

.....
.....
.....

14. How is the food shared?

Meal (ML)	How its Shared (FSHRD)
Breakfast	
Lunch	
Super	

(1= Rationed; 2= Self served; 3= Central place with the whole family siting around to eat)

15. Why is food served as in question 14 above?

.....
.....
.....
.....

16. Do you get satisfied? _____ (0= no; 1= yes)

17. If not, what do you do?

.....
.....
.....
.....

17. How do you feel when you are hungry?

a).....

b).....

c).....

18. In what ways does hunger affect your learning?

.....
.....
.....
.....

Section D: Describing School Feeding Programs

19. Does the school have a school feeding program?

SCHFEEED_____

(0= no; 1= yes)

20. If yes, describe the consistency of the food that is served.

.....
.....
.....
.....

21. How is the food served, and in what quantity?

How food is served		Quantity
1.		
2.		
3.		
4.		

22. Do you participate in the school feeding program?

PARTSFP _____ (0= no; 1= yes)

23. If not, why?

.....
.....
.....

24. What is the teachers' role in the school feeding program?

.....
.....
.....

25. Any challenges with the school feeding program?

.....
.....
.....
.....

26. Does your school have a school garden? **SGARD** _____

(0= no; 1= yes)

27. If yes, what do you have to say about the school garden?

.....
.....
.....
.....

Section E: Household Welfare

28. (a) What are your parents' occupations? I) Father **FOCCUP** _____
II) Mother **MOCCUP** _____

1. *Farmer* 2. *Teacher* 3. *Businessman* 4. *Doctor* 5. *Engineer* 6. *Lawyer* 7. *Housewife* 8. *Other (specify _____)*

(b) Type of walls (main house): **MNWALL** _____

1. *Wood and mud* 2. *Mud/bricks* 3. *Concrete bricks*; 4. *Stones/blocks*; 5. *Wood*; 6. *Other (specify _____)*

(c) Type of roof (main house): **MNROOF** _____

1. *Grass thatched* 2. *Iron Sheets* 3. *Tiles* 4. *Wood covered with mud or dung* 5. *Other (specify _____)*

THANK YOU FOR YOUR PARTICIPATION!

Appendix 2: Work Plan

Activity	Month of the year											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Proposal Development	■	■	■									
Designing Research Instruments			■									
Initial field visits				■								
Identification of field partners				■								
Documentation of agreed expectations roles and responsibilities of the partners					■							
Jointly developing generic calendar of activities						■						
Data collection							■	■				
Data organisation and analysis								■	■			
Interpretation and write up of draft thesis									■	■		
Making corrections										■		
Final thesis write up										■	■	
Submission of final thesis												■