A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE MASTER OF PUBLIC HEALTH DEGREE OF MAKERERE UNIVERSITY

2004
Declaration

To the best of my knowledge, I declare that this work is original and it has never been presented anywhere either partially or in total for any award unless otherwise stated. I would therefore like to present this work for the award of the Degree of Master of Public Health of Makerere University Kampala, Uganda.

Author:

Barbara Eva Kirunda

Date

This dissertation has been submitted for examination with the approval of the following supervisors:

Professor John T. Kakitahi

Date

Mr David O. Mukanga

Date
Dedication

This work is dedicated to the most important people in my life: my father Dr D. W Kirunda, my mother Mrs E. Kirunda, my siblings Jane Magoba, Ken Kagodo, Daudi Kabwigu and Dr. E. F Tabusibwa.
Acknowledgement

I would like to thank all the lecturers in Makerere University Institute of Public Health who have taught me and guided me throughout the course. I have learnt a lot from my colleagues most especially the discussion group members with whom I have shared with lectures and experiences throughout the course. I thank you all.

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## Acronyms and Abbreviations

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<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>ACC</td>
<td>Administrative Committee on Coordination</td>
</tr>
<tr>
<td>CDC</td>
<td>Centres for Disease Control and Prevention</td>
</tr>
<tr>
<td>DDHS</td>
<td>District Director of Health Services</td>
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<tr>
<td>DHT</td>
<td>District Health Team</td>
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<tr>
<td>FAO</td>
<td>Food and Agriculture Organisation</td>
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<tr>
<td>MoA</td>
<td>Ministry of Agriculture</td>
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<tr>
<td>MoES</td>
<td>Ministry of Education and Sports</td>
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<tr>
<td>MoH</td>
<td>Ministry of Health</td>
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<tr>
<td>MUIPH</td>
<td>Makerere University Institute of Public Health</td>
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<tr>
<td>NCHS</td>
<td>National Centre for Health Statistics</td>
</tr>
<tr>
<td>PEM</td>
<td>Protein Energy Malnutrition</td>
</tr>
<tr>
<td>SCN</td>
<td>Sub Committee on Nutrition</td>
</tr>
<tr>
<td>SFP</td>
<td>School Feeding Programme</td>
</tr>
<tr>
<td>SPSS</td>
<td>Statistical Package for Social Scientists</td>
</tr>
<tr>
<td>UNICEF</td>
<td>United Nations Children's Fund</td>
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<tr>
<td>UNS</td>
<td>United Nations System</td>
</tr>
<tr>
<td>UPE</td>
<td>Universal Primary Education</td>
</tr>
<tr>
<td>USA</td>
<td>United States of America</td>
</tr>
<tr>
<td>VAD</td>
<td>Vitamin A Deficiency</td>
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<tr>
<td>WFP</td>
<td>World Food Program</td>
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<td>WHO</td>
<td>World Health Organization</td>
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Operational Definitions

School Feeding Programme is the provision of meals by schools to school children.

Socioeconomic status index in this study is defined by the occupation of the legal guardians and the physical characteristics of the family dwelling place (type of materials used on the house and sanitary facilities).

Poor socioeconomic status in this study is defined by (i) an individual employed in the informal sector, living in a temporary house and using a low level sanitary facility or (ii) employed in the informal sector, living in a temporary house and using a high level sanitary facility or (iii) employed in the informal sector, living in a permanent house and using a low level sanitary facility or (iv) employed in the formal sector, living in a temporary house and using a low level sanitary facility.

Good socioeconomic status in this study is defined by (i) an individual employed in the formal sector, living in a permanent house and using a high level sanitary facility or (ii) employed in the formal sector, living in a permanent house and using a low level sanitary facility or (iii) being employed in the formal sector, living in a temporary house and using a high level sanitary facility or (iv) being employed in the informal sector, living in a permanent house with a high level sanitary facility.

Formal employment is defined as having an occupation in the public or private sector earning a regular salary.
Informal employment is defined as having another occupation other than the public or private sector not earning a regular salary.

A balanced meal is defined as a meal comprising of at least one food from the three main food groups namely energy rich foods, protein rich foods and foods containing vitamins and minerals.
Abstract

Background: Despite a government policy to the effect that all children in day schools shall be provided with lunch, only 35% of day primary schools had a feeding programme in Jinja district. No information was available on effects of school feeding programmes on nutritional status. The general objective of the study was to compare the nutritional status of pupils in primary day schools with and without a school feeding programme.

Methodology: This was a cross-sectional comparative study conducted in primary day schools in Jinja District. Two hundred and twenty pupils from schools with a feeding programme and 228 pupils from schools without a feeding programme were randomly selected from the 8-13 year age group which is expected to be in primary school according to the Ugandan primary school age structure. Semi structured questionnaires were used to obtain information from the pupils. Vertical measuring tapes and weighing scales were used to obtain height and weight measurements respectively. The 24 hour food recall method was used to obtain information on adequacy of food intake and meals taken. Key informant and focus group discussion guides were used to obtain information about perceptions on school feeding programmes from the school administration and parents respectively.

Results: Stunting among pupils in schools with a feeding programme was 12.7% and 20.2% in schools without a feeding programme. Underweight among pupils in schools with a feeding programme was 0.9% and 5.7% in schools without a feeding programme. On further analysis, pupils in schools without a feeding programme were more likely to be underweight OR=9.35 (95% CI:1.99-43.85) and overweight OR=3.32 (95% CI:1.11-9.91).

Other factors influencing nutritional status were younger age OR=0.22 (95% CI:0.63-0.74) and female guardian employed informally OR=0.16 (95% CI:0.04-0.65) were less likely to be underweight. Lower education level OR=4.17 (95% CI:1.28-13.66) and poor socioeconomic status for male guardian OR=7.11 (95% CI:1.33-37.94) were more likely to be underweight. Younger age OR=0.40 (95% CI:0.22-0.75), female guardian employed informally OR=0.40 (95% CI:0.18-0.88) and survivorship of both parents OR=0.43 (95% CI:0.19-0.94) were less likely to be stunted. Male pupils OR=3.03 (95% CI:1.77-5.21) and poor socioeconomic status for male guardian OR=2.50 (95% CI:1.11-5.63) were more likely to be stunted. Younger pupils OR=0.21 (0.07-0.64), males OR=0.36 (95% CI: 0.13-0.97) and pupils who had < 3 meals OR=0.31 (95% CI: 0.12-0.83) were less likely to be overweight.
Pupils in schools with and without feeding programme 80.0% and 76.8% respectively had breakfast. Pupils in schools with a feeding programme were less likely not have morning break OR=0.11 (95% CI: 0.06-0.19), lunch OR=0.02 (95% CI: 0.00-0.13) and evening break OR=0.27 (95% CI: 0.18-0.41).

Both parents and school administration had positive perceptions about school feeding programme.

**Conclusions:** Pupils in schools with a feeding programme had a better nutritional status than those in schools without a feeding programme.
CHAPTER 1

1.0 Introduction

A school feeding programme (SFP) is one of the several interventions that address some nutritional and health related problems faced by school-age children (Partnership for Child Development, 1999).

SFPs differ from one another in various significant ways. Some SFPs may provide only a snack while others may offer a complete meal. Some SFPs rely solely on donated products and others supplement them with locally purchased commodities. Programmes offering complete meals may vary widely in size and composition of rations. Some may operate in areas where primary school enrolment reaches nearly universal proportions and others may be conducted in communities where only a small minority of the population completes 5 or 6 years of school. They also differ significantly in terms of the beneficiaries of the programme (Levinger, 1986). For example, some may target the girl child to address barriers to female education.

More children are reaching school age and more are going to school than ever before (UNICEF, 1995). Therefore, the concern of school feeding programmes would be to alleviate hunger in school children, motivate parents to enrol their children in school and encourage school children to attend regularly, to improve their nutritional status and to increase community involvement in schools.

Nutritional and health status are powerful influences on the learning and academic performance of a child in school. Children suffering from malnutrition and hunger do not have the same potential for learning as well nourished and healthy children. Cognitive development
in school children may be impaired as a result of poor health and nutrition (Partnership for Child Development, 1999).

The true extent of the burden of malnutrition and ill health is not fully known as a better picture of the nutritional status and health of the school age group is still being built (UNSCN, 2002).

1.1 Background

In school children, poor nutrition seriously compromises their learning capacity and health (UNACC/SCN, 1998).

An international school feeding campaign was launched by World Food Program (WFP) to feed and educate those millions of children the agency did not reach in 2001 (WFP, 2003).

According to the Uganda National Food and Nutrition Policy and the Uganda National School Health Policy, meals should be provided to children while at school. However, in Uganda, a few schools have some form of a feeding programme which was started and managed on the schools’ initiative with support from the parents. Only 26% of day schools provide children with at least one meal in any form such as porridge, juice or snacks while at school and the majority of school children go without a meal between 7.00 a.m and 6.00 pm (Jitta et al, 2000/1).

WFP is running SFPs that provide a daily hot meal in a few districts in Uganda which have had civil strife such as Gulu, Kitgum, Arua, Adjumani, Moyo, Bundibugyo, Kotido, Moroto and Nakapiripirit covering pre-primary, primary, secondary and boarding schools. The daily ration per child comprises of 40gms of corn soya blend and 15gms of sugar for morning break, 200gms of maize meal, 30gms of beans, 15gms of vegetable oil and 5gms of salt for lunch for
day schools, and for the boarding schools, it comprises of 350gms of maize meal, 100gms of beans and 25gms of oil. WFP and MoES plan to implement a national SFP that is anticipated to start from January 2005 to 2009 (MoES, MoH, MoA and WFP).

In Uganda, even in a few areas where SFPs were run, there was scanty information about the management, extent of coverage and the effects of SFPs on nutritional status of pupils. For instance in Jinja district, only 35% of the primary day schools had a feeding programme. In the SFPs in Jinja District, each child is required to contribute 5kgs of maize seeds or its equivalent in cash per term in Jinja Municipality (urban) and 3kgs of maize seeds or its equivalent in cash per term in Butembe and Kagoma constituencies (rural). The maize is ground to maize flour and used to prepare porridge with no sugar and milk. The porridge is taken for lunch only (Personal communication from the Assistant Inspector of Schools-Jinja District, 2004). However, there is no information on the ration size because these SFPs are organised by the parents and school administration.

The School Health Policy promotes not only good nutrition and health but also other measures that enhance the positive synergistic relationship of appropriate education, good health, quality of life, academic performance and economic or social productivity. It states in part as one of its objectives that to promote better nutrition and feeding practices in school (MoH and MoES).

With the advent of Universal Primary Education (UPE), the parents or guardians are required to contribute towards feeding of their children (MoES, 1998).

UPE is the provision of basic primary education to all Ugandan school going age children. The UPE programme was introduced by the Government of Uganda in 1997 as part of the
government policy to provide free primary education to four Ugandan children in every family (MoES, 1998). Over the years, the enrolment has increased. The total enrolment after launching UPE increased from about 2.5 million in 1996 to about 6.8 million by 2000 (MoES, 2001) and currently, it is 7.5 million (IRIN, 2004).

With the increase in enrolment of school children for primary education and the fact that there were very few schools in Uganda with a feeding programme, there was a need to establish the effects of the present SFPs on the nutritional status of school children in Jinja District.
CHAPTER 2
2.0 Literature Review

2.1 Benefits of School feeding programmes

Experience has shown that a properly designed and effectively implemented SFP can do the following: improve nutritional status, attendance and cognition, increase enrolment, alleviate hunger and promote community participation.

2.1.1 Improve Nutritional status

Growing children are at high risk of developing malnutrition. In Uganda, 39% of children less than five years are stunted, 4% are wasted, 23% are underweight, 65% are anaemic and 28% suffer from Vitamin A Deficiency (VAD) (UBOS and ORC Macro, 2001). The pre-school children are likely to carry this nutritional status into schools and yet there is no guarantee that they will be fed well. In some schools, some children may have snacks only, some may have meals and others may remain hungry.

SFPs can reduce the school children’s susceptibility to Protein Energy Malnutrition (PEM), other nutritional deficiencies and debilitating diseases and also provide essential nutrients that are needed for cognitive functioning through provision of a nourishing meal regularly (Janke, 1996).

Chens’ (1989) study of impact of a school milk programme on nutritional status of 2,766 school children aged 6-9 years in Ulu Selangor found that there was a reduction in the prevalence of PEM in terms of underweight, stunting and wasting 2 years after the introduction of a SFP. The reduction in the prevalence of PEM and the improvement of the attendance rate among the
children was likely to be due to the impact of the school milk feeding programme. However, a period of 2 years is not adequate to provide conclusive results on reduction in stunting.

In an earlier pilot study in Jamaica, the school attendance of students improved when given breakfast for one term (Powell et al, 1983). This finding was replicated in a larger study where children were randomly assigned for one year to groups with and without breakfast. The students in the school breakfast group more significantly attended than those in the non breakfast group during the year. Their nutritional status also significantly improved (Powell et al, 1998).

Simeon and Granthman-McGregor (1989) in a study in Jamaica found that provision of breakfast to primary school children significantly increased their attendance and arithmetic scores. The wasted, stunted and previously malnourished children benefited most.

In India, a cross-sectional comparative study evaluated the impact of a midday meal programme in primary schools. There was higher growth performance, enrolment, attendance and retention rates, reduced drop-out rates and higher scholastic performance among the school children participating in midday meal programme than those not participating (Laxmaiah et al, 1999).

In Chile, a case-control study of the impact of providing heme-fortified cookies to school children found that there was a higher haemoglobin concentration among the children receiving the fortified cookies through the lunch programme and was more significant in children with greater demands for iron like the post menarchial girls and puberty boys (Walter et al, 1993).
Kruger and Badenhorst (1994) in a study in South Africa providing iron and vitamin C fortified soup to schools in a low socio-economically developed area in the Cape Peninsula found that at baseline 12% of 6-7 years and 20% of 8-12 years old children had low weight for age and 49% of 6-7 years and 31% of 8-12 years old children had low serum ferritin. Fifteen weeks after the intervention, the iron status had significantly improved with the proportion of children having low serum ferritin reducing from 49% to 28% in 6-7 years and 31% to 21% in 8-12 years old children.

In Indonesia, a pilot project involving the integration of a school feeding programme and de-worming found that combining both interventions had a greater impact on the growth of school children than when only food was provided (Partnership for Child Development, 1999).

In Jamaica, the effects of the school meal on growth, achievement and attendance was examined and it was found that the provision of breakfast had no effect on weight gain and it resulted in higher school attendance and greater achievement in arithmetic (Powell et al, 1998).

A cross sectional survey in Trinidad and Tobago evaluated the provision of free school meals in relation to social and nutritional status of children in admission classes (aged 4 to 7 years) and classes for 'rising nines' (aged 7-10 years). It found that receipt of free meals was associated with larger family size, lower paternal educational attainment, father's employment, maternal education, employment and household amenities. After adjusting for age, sex and ethnic group, children who received free meals were shorter, lighter and thinner. Free school meals were widely available, with some targeting of provision to children with less favourable social and nutritional status (Gulliford et al, 2002).
An evaluation of a school lunch programme in Madhya Pradesh State in Central India compared children from high programme efficiency schools with a greater number of feeding days with children from low efficiency schools with less number of feeding days. It found that with an increase in number of feeding days, nutritional status improved significantly, the children were heavier and taller in high programme efficiency schools as compared with the low efficiency programme schools. Schools with greater number of feeding days had a significantly higher number of children with normal and marginal nutritional status. A larger number of children in low programme efficiency schools were stunted and underweight. Stunting and normal weight were not statistically different between high and low programme efficiency schools (Rewal).

Satoto (1993) assessed the impact of a cooked school meal on nutritional status, school attendance, IQ, and school performance in Lombok, Indonesia. The impact of the combined intervention of food and de-worming was also assessed. Both the SFP and the anthelmintic treatment were associated with increased calorie intake. However, there was no impact on hemoglobin levels. Height-for-age and weight-for-age improved with the SFP and with the combined intervention. The best results were obtained with combined intervention, while anthelmintic treatment with Mebendazole alone improved nutrition more than food alone. Males benefited more than females and children aged 6-7 benefited the most. The impact on height-for-age was greatest in 8 to 9 year old children while no effect was discernible in 10 to 11 year old group.

However, some studies showed no significant improvement in the nutritional status of pupils as follows: Simeon (1998) evaluated a SFP in Jamaica. He found that after one semester, the class receiving the meal showed improved arithmetic scores and school attendance when
compared with the control classes. However, there was no weight gain. Confounding may not have been totally ruled out due to the study design.

An evaluation of a school breakfast programme in Jamaica found that the programme made a significant contribution to the diet of some school children by providing 32.2% of daily energy needs and 45.1% of protein. However, there was no discernible effect on nutritional status and school attendance (Chambers, 1991).

Dietary intake and nutritional status of children in a school with a lunch programme and children in a school without a lunch programme in Nyambene District, Kenya was compared. Daily caloric consumption in the group with a feeding programme was significantly higher than that in the group without a feeding programme. Protein intake was not significantly different between the two groups. However, it was higher for children without a feeding programme than for those with a feeding programme. Wasting prevalence among children with a feeding programme was significantly higher than among those without a feeding programme possibly due to irregularity of the school lunch programme and lower dietary intake at home. Stunting level was about the same. There was no significant difference in the underweight prevalence. The nutritional status of girls was better than that of boys though there was no statistically significant difference (Meme et al, 1998).

2.1.2 Alleviate Short Term Hunger and Improve Cognition

Short term hunger in malnourished or well nourished school children can be alleviated thus increasing concentration and attention of students. Children may be unable to benefit from teachings if they may are undernourished or if they come to school tired or hungry (Ani and Grantham-McGregor, 1999). Hungry children are more likely to have difficulty in concentrating
and performing complex tasks, even when they are well nourished (Del Rosso and Marek, 1996).

A study in Jamaica examined the effects of short term hunger on the cognitive function of children with different nutritional status. It was found that when the undernourished children received breakfast, there was an improvement in cognitive function and there was no difference in the well nourished children (Chang et al, 1996).

In Peru, a study assessed the effects of breakfast on cognitive performance in 9-11 year old boys of whom 23 were malnourished and 29 were well nourished. The breakfast included a nutritionally fortified beverage and an iron fortified baked grain product that were similar to the meals provided in the government sponsored school breakfast programme. It was found that speed in performing a short term memory test and discrimination of geometric patterns were improved under the breakfast condition in both groups and the effect was more pronounced in the malnourished children (Pollitt et al, 1995). However, the sample size of pupils was too small and therefore the findings can not be generalised to the target population.

Meyers et al (1989) did a study in USA and showed that there were benefits from providing breakfast to the disadvantaged primary school children. The low income children significantly scored lower in the achievement tests than those who were not of low income before the introduction of a breakfast programme. On introduction of the breakfast programme, the test scores of the children participating improved more than the non participants. There was an improvement in attendance of participating children.
A Swedish study by Wyon et al (1997) was done in schools with a cross-over design and it found that children who were randomly assigned to receiving an adequate breakfast performed better in tests of creativity and addition, and also persevered more in physical exercises than those assigned to inadequate breakfasts.

2.1.3 Increase Enrolment and Improve Attendance

The parents can be motivated by the SFP to enrol their children in school and also have them attend school regularly. The educational outcomes such as performance, dropout and repetition can improve if the programmes effectively reduce absenteeism and also increase the duration of schooling. The children performing poorly are more likely to repeat grades and drop out of school due to diminished cognitive abilities and sensory impairments. They tend to enrol in school at a later age and if so, they finish fewer years at school (Del Rosso and Marek, 1996).

In Peru, participants of a school breakfast programme and non participants were compared and it was found that despite the short duration of 15-30 days, attendance significantly increased among the participants (Pollitt et al, 1995).

In Burkina Faso, an evaluation of an ongoing SFP found that there was an increase in school enrolments, regular attendance and consistently lower repeater rates, lower dropout rates in the disadvantaged provinces and also higher success rates in the national exams especially girls were associated to school canteens (Moore, 1994).

A small pilot SFP in Malawi was evaluated for its effect on the enrolment and attendance. It was found that in over a period of 3 months, there was 5% increase in enrolment and 36%
improvement in attendance when compared to control schools in the same period (WFP, 1996).

2.1.4 Promote Community Participation

Schools depending on the community to organise and implement SFPs have advantages such as increase in the contact and communication between the parents and teachers, officials and others; the parents become more aware of what occurs in schools and the value of education in the community is raised (Partnership for Child Development, 1999).

2.2 Community Perceptions about School Feeding Programmes

Community perceptions about SFPs are important for sustainability of SFPs. Their perceptions may influence their participation in the programme and also the enrolment of their pupils onto the feeding programme. Some studies on the community perceptions are as follows:

A study in Trincomalee in Sri Lanka showed that parents, teachers and principals of schools were very satisfied with the midday meal programmes. The parents reported some benefits such as children were willing to go to school, appeared happier, commitment from parents was good and there was active cooperation with the school development society. The teachers and principals said that there was an increase in enrolment, increase in number of attendance days and improvement in concentration during lessons, the learning ability and interest. However, the principals said that they had difficulty in encouraging parents to contribute to the midday meal programme and to motivate them to attend meetings (Pletzsch, 2003).
In Minnesota, the principals and teachers believed that school breakfast programme positively contributed to school improvement efforts, academic achievement and positive climate. Student hunger and inattentiveness to learning also improved (Peterson et al, 2003).

Morgan-Brown (2003) in a study on teacher's perceptions of a school breakfast programme in Connecticut found that most of the teachers believed that the school breakfast programme positively influenced the student's care and the school day. They also noticed an improvement in the student's attentiveness. They believed that the behavior, motivation and certain social attributes of the students were enhanced by student participation. They also believed that the school breakfast programme made their job easier.

The SFPs have been showed to have numerous benefits if well designed and implemented. However, there was inadequate information showing the effect of the existing school feeding programmes on nutritional status of school children in Jinja District.

2.3 Anthropometric Indices

Anthropometry can be used to assess and predict performance, health and survival of individual, reflect the economic and social well being of populations. The advantages are that they are sensitive over the full spectrum of malnutrition, non-invasive, inexpensive and relatively easy to obtain. However, they lack specificity as changes in body measurements are sensitive to other factors such as nutrient intake, infection, altitude, stress and genetic background (de Onis, 2000).
2.3.1 Weight-for-age

It reflects body mass relative to age. It is a composite measure of height-for-age and weight-for-height. Low weight-for-age identifies underweight for a specific age. Low weight-for-age relative to a child of the same sex and age in the reference population is lightness as underweight refers to severe deficits in weight-for-age. It reflects both chronic and acute undernutrition but cannot distinguish between the two. It is recommended for assessing changes in the magnitude of malnutrition over time. However, it confounds the effects of both short and long-term health and nutrition problems (World Bank, 2004).

2.3.2 Height-for-age

It reflects linear cumulative growth above 2 years of age. Low height-for-age identifies past undernutrition or chronic malnutrition. It cannot measure short term changes in malnutrition. Low height-for-age relative to a child of the same sex and age in the reference population refers to shortness. Extreme low height-for-age is stunting. It is primarily used as a population indicator rather than for individual growth monitoring (World Bank, 2004).

2.3.3 Body Mass Index-for-age

It is used to assess underweight, overweight and risk for overweight in children and adolescents from 2 to 20 years. It is effective for screening but not diagnosis. It is age and gender specific. Its advantages are that it provides a reference for adolescents that was not previously available, consistent with adult index so it can be used continuously from 2 years to adulthood, it tracks childhood overweight into adulthood and it also correlates with clinical risk factors for cardiovascular disease including hyperlipidemia, elevated insulin, and high blood pressure. It compares well with weight-for-height and measures of body fat (CDC, 2002).
CHAPTER 3

3.0 Statement of the Problem

Although the Government of Uganda has a policy on nutrition in schools to the effect that all children attending day schools shall be provided with lunch at school and adequate safe drinking water as a bare minimum, only 35% of day primary schools have a feeding programme run on the schools' initiative in Jinja district (Personal communication from the Assistant Inspector of Schools -Jinja District, 2003).

The Government of Uganda introduced UPE and 7.5 million children (IRIN, 2004) are currently enrolled in primary schools. This constitutes a large number of nutritionally vulnerable children who spend more than 75% of their time at school yet only a few schools provided meals to the school children. Even in schools where there was a feeding programme, the effects of the SFPs on nutritional and health status were not known.

There is a need for information on the effects of the present SFPs on nutritional status of school children attending primary education in Jinja district.

3.1 Justification

In Uganda, 87% of school children of age 6-12 years are attending primary school (UBOS and ORC Macro, 2001) and therefore a higher proportion is actually attending primary school as a result of introduction of UPE by the Ugandan Government in 1997. Good nutrition in children is crucial for achieving UPE and gender equity (Sibanda-Mulder, 2003). The children of today are the key resource for better tomorrow. With the right nutrition, education and care, they can become valuable contributors to the nation's wealth and security.
To date, inadequate work has been done in an attempt to link nutritional status of school children to the presence of a school feeding programme. Therefore, there was a need for information on the effects of school feeding programmes on the nutritional status of school age children attending primary schools in Jinja District.

The study generated information that will be used by the DHT and other stakeholders to plan appropriate interventions to promote new policy and programme partnerships formulation. These would support and improve nutrition in schools and also provide information that would strengthen the already existing policies on school feeding.
3.2 Conceptual Frame Work

Figure 1: A conceptual framework of caregiver factors, policies, school factors, pupil factors and SFP influencing nutritional status.

Caregiver/Parent factors
- Socio-demographic factors
- Knowledge
- Attitude
- Beliefs
- Family & community support
- Resources
- Nutritional & health status
- Hygiene practices
- Food production, preparation & storage
- Health seeking practice
- Access to health service
- Safe water & sanitation

Policies on nutrition

School factors
- Nutrition education
- Location of school
- Ownership of school
- Staff perceptions of SFP

Existence of School Feeding Programme

Nutritional status
- Weight-for-age
- Height-for-age
- Body mass index-for-age

Performance, Attendance, Absenteeism and Dropout rates
The conceptual framework is further described below:

The caregiver factors influence the pupil factors either directly or indirectly. The socio-demographic factors of the parents include religion, tribe, and education level influence the pupils. Other factors such as knowledge, beliefs, attitudes, family and community support and resources influence pupils' dietary patterns. Other parent factors: nutrition and health status, hygiene practices, food production, preparation and storage, health seeking practices, access to health services, safe water and sanitation influence pupils' health status. School factors may determine the existence of a SFP. Policies on nutrition influence the existence of a SFP which in turn may influence the nutrition status of school children depending on the foods provided, type, regularity, duration of SFP. Nutritional status may influence the performance, attendance, absenteeism and dropout rates of the pupils.

The factors studied were some socio-demographic factors of legal guardian such as occupation and socio-economic status index of both guardians; pupil factors such as socio-demographic factors, dietary patterns and nutritional status and the school factors such as location, ownership and existence of school feeding programme. Parents' and school administration perceptions about school feeding programmes were also studied.

3.3 Research Hypothesis

- Pupils attending primary day schools with a feeding programme have a better nutritional status than those in schools without a school feeding programme.
CHAPTER 4

4.0 Study Objectives

4.1 General Objective

To compare the nutritional status of pupils in primary day schools with and those without a SFP so as to generate information that would be used by the DHT and other stakeholders to plan appropriate interventions that would improve nutrition in primary schools.

4.2 Specific Objectives

- To compare the nutritional status of the pupils attending primary schools with and those without a feeding programme.

- To compare the dietary patterns of the pupils attending primary day schools with and those without a feeding programme.

- To describe the perceptions of the parents about a school feeding programme.

- To describe the perceptions of the school staff about a school feeding programme.
CHAPTER 5

5.0 Methodology

5.1 Study Area

The study was done in Jinja District which is located in South Eastern Uganda. It is bordered by Kamuli in the North, Iganga in the East, and Lake Victoria in the South with a surface area of 734 km² of which 90% (677 km²) is arable land and Mukono in the West. It has four health sub-districts or constituencies and twelve sub counties. The study was done in 2 Health Sub Districts: Jinja Municipal East and Kagoma (see appendix VI) because they were representative of the other health sub districts.

Jinja District has a population of 413,937 of which 207,228 are males and 206,709 are female. Of the total population, 313,600 (76%) live in the rural areas with a relatively high population density of 564 per km². It has a high population growth rate of 2% in rural and 2.8% in the urban areas with a very youthful dependent population of about 50% under 15 years of age who are potentially eligible for basic education. There are a total of 162 primary schools in Jinja district. There are 4 health sub districts with 25 primary schools in Jinja Municipal East and Jinja Municipal West, 74 primary schools in Kagoma and 63 primary schools in Butembe. Twenty five primary day schools were selected in both Jinja Municipal East and Kagoma of which 11 had a feeding programme and 14 had no feeding programme.

5.2 Study Population

The target population comprised of all the pupils within the age group of 8-13 years attending primary day schools with and those without feeding programmes in Jinja District. This age group was selected because it is the required age group of pupils expected to attend primary education who spend the whole day at school according to the Uganda Education structure.
The actual study population comprised of the selected pupils from P.4 to P.7 in Jinja Municipal East and Kagoma Health Sub Districts. Pupils below 8 years and in P.3 were excluded from the study because they did not stay at school for afternoon lessons and therefore did not have meals provided at school.

5.3 Study Design

A cross-sectional comparative study was done employing data collection tools for both qualitative and quantitative data during March to April 2004 in Jinja District.

5.4 Sample Size

The sample size of the pupils was determined by using the standard formula for a comparative study (Schlesselman, 1982) as shown below:

\[
n = 2 \frac{P \bar{Q} (Z_\alpha + Z_\beta)^2}{(P_1 - P_0)^2}
\]

Where,

\(n\) = sample size for each group

\(P\) = prevalence of underweight among school children of age 5-10 years in a school with a feeding programme in Kenya (Meme et al, 1998); \(P_1 = 22\%\).

\(P_0\) = prevalence of underweight among school children without a feeding programme; \(P_0 = 50\%\) since it was not known.

\(Z_\alpha = Z\) value corresponding to the desired level of significance (5\%) = 1.96

\(Z_\beta = Z\) value corresponding to the desired power of the study (99.9\%) = 3.09

\[
P = \frac{P_1 + P_0}{2} = \frac{0.22 + 0.50}{2} = 0.36
\]

\[
\bar{Q} = 1 - P = 1 - 0.36 = 0.64
\]

\[
n = 2 \times 0.36 \times 0.64 (1.96 + 3.09)^2
\]

\[
\frac{(0.22 - 0.50)^2}{0.22 - 0.50)^2} = 150 \text{ pupils in each group}
\]
A total of 448 pupils were included in the study with 220 and 228 pupils from schools with and those without a feeding programme respectively. The sample size of 150 was exceeded to cater for non response, poorly filled questionnaires and drop out.

Four focus group discussions (FGDs) for each sex comprising of 8 to 12 parents were held in each health sub district totalling to 8 FGDs. The FGDs on perceptions of SFPs were conducted in the local language Lusoga by a trained and experienced moderator. Notes were written by the Principal Investigator and one of the research assistants and the discussions were tape recorded.

Twenty seven key informants were selected and interviewed on their perceptions about school feeding programmes by the Principal Investigator and well trained research assistants. The key informants included the District Director of Health Services, Assistant Inspector of schools, Head Teachers and their Deputies of the selected schools.

5.4.1 Inclusion Criteria

The pupils within 8-13 years age group attending primary day school schools with and those without school feeding programmes who received consent from their parents participated in the study. The pupils had to have attended the same school for at least two years. Those in schools with a feeding programme had to have been enrolled onto the programme for at least 1 year. Schools without feeding programmes were those that had not been providing meals to the school children for at least two years.
5.5 Sampling Procedure

5.5.1 Quantitative Data

Out of the four health sub districts (two urban and two rural) in Jinja District, two namely Jinja Municipal East (urban) and Kagoma Health Sub Districts (rural) were randomly selected by “lottery method” by writing names on small pieces of paper which were folded and placed in an open bowl. After shaking the bowl, one piece of paper was randomly selected for each category of health sub district. So one urban and one rural health sub district were randomly selected by “lottery method” because they were representative of the other health sub districts. A situation analysis was done in the selected health sub districts to find out which schools provided meals and those that did not and the type of meals that were provided.

In each selected health sub district, the sub counties were randomly selected. Within Kagoma Health Sub District, two out of four sub counties namely Budondo and Buwenge were randomly selected by “lottery method” because they were similar to other sub counties. In Jinja Municipal East Health Sub District, the only sub county was selected.

Within each sub county, the primary day schools were randomly selected. In Budondo Sub County, eight schools out of fifteen eligible schools were selected. The only three schools with a feeding programme were purposively selected and five out of eleven schools without a feeding programme were selected randomly using the “lottery method.” In Buwenge Sub County, eleven out of nineteen eligible schools were selected. Four out of nine schools with a feeding programme and seven out of ten schools without a feeding programme were selected randomly using the “lottery method.” Within Walukuba -½ of Jinja Central Sub County, six out of eight eligible schools were selected. Four of the six schools with a feeding programme were
randomly selected by "lottery method." The only two schools without a feeding programme were considered.

In each selected school, a list of names of pupils from P.4 to P.7 within the age group of 8-13 years with written informed consent formed a sampling frame. Each pupil was given a unique identifier. Using random number tables, eighteen pupils from each school were randomly selected from the sampling frame. These pupils had to have satisfied all the inclusion criteria before they were enrolled into the study. Schools that did not have complete streams from P.3 to P.7 were replaced by a school in the neighbourhood with complete streams. For schools with feeding programmes, neighbourhood schools without feeding programmes were selected such that the schools were comparable.

5.5.2 Qualitative Data

The key informants were purposively selected. These included the Assistant Inspector of schools and District Director of Health Services at the district level, Head Teachers and Deputy Head Teachers of the selected schools at the school level. The parents of the pupils staying near the schools were selected to participate in the focus group discussions due to short distance of their homes from schools and limited resources.

5.6 Study Variables

5.6.1 Dependent Variables

Nutritional status was measured as height-for-age, weight-for-age and body mass index-for-age. Age, height and weight variables were used to derive the nutritional indices. The National Center for Health Statistics/World Health Organisation (NCHS/WHO) standards for nutritional status were used to categorise the data on weight-for-age into underweight (< -2SD of the
median value of the NCHS/WHO international growth reference), normal (-2 SD to < +2 SD) and overweight (> +2 SD), height-for-age into stunted (< -2SD), normal (-2 SD to < +2 SD) and tall (> +2 SD) and CDC standards (2002) were used to categorise body mass index-for-age into underweight (< 5th percentile of CDC’s NCHS growth reference), normal (5th to 85th percentile), at risk of overweight (85th to < 95th percentile) and overweight (≥ 95th percentile).

5.6.2 Independent Variables

Pupil factors were age, sex, tribe, religion, educational level, residence, birth order, number of sisters, number of brothers, total number of siblings, frequency of food intake, had breakfast, place where breakfast is had, adequacy of food intake, coping measures for lunch, number of people at home, distance of school from home, the people the child lives with, history of chronic illness and illness in the last 2 weeks.

Care giver/Parent factors were socio-economic status for both male and female guardians, occupation of the male and female guardians.

School factors were location of the school, ownership of school and existence of a school feeding programme.

5.7 Data Collection

5.7.1 Training of Research Assistants

Four research assistants who were health workers with an A level certificate and a diploma in any tertiary course were recruited and trained for one day on data collection and use of data collection instruments. They were able to speak English, Luganda and Lusoga languages.
5.7.2 Tools
Semi structured questionnaires were used to elicit information from the pupils on socio-demographic characteristics, health status, school characteristics and information on dietary patterns was obtained using the 24 hour recall method (FAO, 1997) (see appendix II). The pupils were asked about what foods they had eaten the previous day. Then adequacy of food intake was determined using foods in the main groups to provide information on balanced diet. A balanced diet meal is a meal containing the right amount of body building protein, energy giving carbohydrate or fat and protective foods and minerals (King et al, 1972). An index for a balanced meal was created using the information about foods from the three main groups namely energy rich foods, protein rich foods and foods with minerals and vitamins.

Focus group discussion guides and audio tape recorders were used to obtain and record information from the parents about their perceptions on SFP (see appendix IV).

Key informant interview guides were used to obtain information from the Assistant Inspector of Schools, Head teachers, Deputy Head Teachers and District Director of Health Services on their perceptions about SFP (see appendix III).

Bathroom scales with 100kg capacity were used to measure the weight. The weight was measured with a precision of 0.1kg when the pupil was barefoot while wearing very light clothing with boys in shorts and girls in light dresses made of polyester (FAO, 1997). Vertical measuring tapes with a length of 175cm were used to measure the height of the pupils with a precision of 0.1cm when barefoot. A vertical wall rising from a truly horizontal floor was located. A horizontal pencil line about 2cm in length at a height of 1m from the floor was drawn and the measuring tape was fastened onto the wall using masking tape. The pupil was told to stand against the wall facing outward and the height was ascertained using a wood block with a true
right angle and dimensions 30 x 10 x 20cm. The methods used for measuring the weight and height are recommended by FAO (1997).

5.7.3 Pre-testing

The data collection tools were pre-tested in two primary schools outside the selected health sub districts prior to the start of the study. This was done to find out whether the questions were well understood by the respondents, to find out whether the questions created biased responses and to find out whether the data tools collected the required data.

5.7.4 Field Editing

The data collected was edited on a daily basis by the Principal Investigator to check for missing data and address the problem of non responses so that the data collection tools were accurately filled.

5.8 Data Management and Analysis

5.8.1 Data Management

The quantitative data was first edited in the field daily by the Principal Investigator. The filled questionnaires were cleaned, edited and coded before entry into the computer. Double data entry was done in EpinInfo 2002 statistical package. The data compare command in EpinInfo 2002 statistical package was used to check for accuracy of double data entry. Then the clean data set was exported to SPSS 10.0 for analysis. For continuous variables, normality of distribution was checked for by creating histograms with a normal curve. There was no need for transformation of the continuous variables.
The qualitative data from the focus group discussions was first transcribed from the audiotapes and then translated from the local language Lusoga to English. The key informant interview guides were coded. The data from both FGDs and key informants was typed in Microsoft Word for ease of reading and analysis.

5.8.2 Data Analysis

For quantitative data, preliminary analysis was done for exploration purposes and to create a basis for the univariate, bivariate and multivariate analysis. Univariate analysis was done and this included frequency tables, graphs and summary measures such as the mean and median for continuous variables such as age, height and weight. Bivariate analysis was done to test for associations between the exposure which was the SFP and the outcomes which were the nutritional indices and between SFP and confounders using the odds ratios and confidence intervals. However, the associations at bivariate analysis were not conclusive due to confounding. Therefore, there was a need to carry out multivariate analysis to rule out confounding and check for interactions. Multivariate analysis was done to check for interactions and to control for confounders that distort the effect of the SFP on nutritional status. Stratification in EpilInfo 2002 was used to check for interactions and logistic regression modelling was done in SPSS 10.0 to control for confounding. The odds ratios and confidence intervals were used to establish associations.

Qualitative data from the key informants and focus group discussions was typed using Microsoft Word for ease of reading and manual analysis using the master sheet technique because this provided the Principal Investigator an opportunity to get familiar with the community perceptions about SFPs. The transcripts were first read and notes were made within the transcripts. Then the responses were open coded. Various sub themes were
generated. Similar sub themes were arranged under themes. The transcripts were re-read to establish the degree to which the themes and sub themes covered all the data from the interviews and discussions. The coded responses were grouped and arranged under appropriate sub themes and themes. Differing responses were marked for quotation. Then a master sheet was used.

5.9 Ethical Considerations

Approval of the study was obtained from Uganda National Council for Science and Technology and Makerere University Institute of Public Health Higher Degrees Research and Ethics Committee. Approval was obtained from the relevant District authorities through an introductory letter that was signed by the DDHS of Jinja District. An introductory letter was presented to the District Education Officer who then endorsed the letter addressing it to the Head Teachers and Deputy Head Teachers of the Primary day schools in the study area. Written informed consent was obtained from the legal guardian of the pupils prior to the study (see appendix I) on invitation to school. Verbal ascent was obtained from the pupils. Strict confidentiality to the respondents was ensured through the use of anonymous identifiers. The data would be used only for this study. The data would be kept under safe custody by the Principal Investigator. The parents of the participants were told the purpose of the study, potential benefits and that the study did not pose any harm.

5.10 Utilization of Results

The findings of the study will be disseminated to the DHT of Jinja District, the District Authorities of Jinja district, MUIPH, Ministry of Education and School Health unit in Ministry of Health.
CHAPTER 6

6.0 Results

6.1 Socio-demographic Characteristics of the Pupils

A total of 448 pupils were interviewed: 220 were in schools with a feeding programme and 228 were in schools without a feeding programme. The socio-demographic characteristics of pupils and their guardians were as shown in table 1 and 2:

<table>
<thead>
<tr>
<th>Variables</th>
<th>School Feeding Programme (SFP)</th>
<th>No SFP %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SFP %</td>
<td>No SFP %</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>52.7</td>
<td>54.4</td>
</tr>
<tr>
<td>Male</td>
<td>47.3</td>
<td>45.6</td>
</tr>
<tr>
<td>Age in years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>0.5</td>
<td>2.2</td>
</tr>
<tr>
<td>9</td>
<td>12.3</td>
<td>11.8</td>
</tr>
<tr>
<td>10</td>
<td>16.8</td>
<td>14.5</td>
</tr>
<tr>
<td>11</td>
<td>19.1</td>
<td>14.9</td>
</tr>
<tr>
<td>12</td>
<td>29.5</td>
<td>26.3</td>
</tr>
<tr>
<td>13</td>
<td>21.8</td>
<td>30.3</td>
</tr>
<tr>
<td>Education level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P.4</td>
<td>33.2</td>
<td>30.7</td>
</tr>
<tr>
<td>P.5</td>
<td>25.0</td>
<td>29.8</td>
</tr>
<tr>
<td>P.6</td>
<td>24.5</td>
<td>23.7</td>
</tr>
<tr>
<td>P.7</td>
<td>17.3</td>
<td>15.8</td>
</tr>
<tr>
<td>Religion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protestant</td>
<td>36.8</td>
<td>52.6</td>
</tr>
<tr>
<td>Catholic</td>
<td>30.0</td>
<td>18.4</td>
</tr>
<tr>
<td>Moslem</td>
<td>20.9</td>
<td>21.9</td>
</tr>
<tr>
<td>Others</td>
<td>12.3</td>
<td>7.0</td>
</tr>
<tr>
<td>Tribe</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soga</td>
<td>66.4</td>
<td>72.4</td>
</tr>
<tr>
<td>Ganda</td>
<td>6.4</td>
<td>11.8</td>
</tr>
<tr>
<td>Others</td>
<td>27.2</td>
<td>15.8</td>
</tr>
<tr>
<td>Birth order</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First</td>
<td>20.5</td>
<td>13.6</td>
</tr>
<tr>
<td>Second</td>
<td>23.6</td>
<td>28.5</td>
</tr>
<tr>
<td>Third</td>
<td>24.1</td>
<td>21.1</td>
</tr>
<tr>
<td>Others (4th to 15th)</td>
<td>31.8</td>
<td>36.8</td>
</tr>
</tbody>
</table>
There were more females than males with 52.7% in schools with a feeding programme and 54.4% in schools without a feeding programme. More pupils 58.2% in schools with a feeding programme and 60.5% pupils in schools without a feeding programme are in primary five and below.

Table 2: Socio-demographic Characteristics of Guardians for Pupils in Schools with and without a Feeding Programme

<table>
<thead>
<tr>
<th>Variables</th>
<th>School Feeding Programme (SFP)</th>
<th>No SFP %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SFP %</td>
<td>No SFP %</td>
</tr>
<tr>
<td><strong>Residence</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>54.1</td>
<td>74.1</td>
</tr>
<tr>
<td>Urban</td>
<td>45.9</td>
<td>25.9</td>
</tr>
<tr>
<td><strong>Socio-economic status for male guardian</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>50.9</td>
<td>69.7</td>
</tr>
<tr>
<td>Good</td>
<td>49.1</td>
<td>30.3</td>
</tr>
<tr>
<td><strong>Socio-economic status for female guardian</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>61.4</td>
<td>73.2</td>
</tr>
<tr>
<td>Good</td>
<td>38.6</td>
<td>26.8</td>
</tr>
<tr>
<td><strong>Child lives with</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Father and mother</td>
<td>63.2</td>
<td>73.7</td>
</tr>
<tr>
<td>Mother alone</td>
<td>20.5</td>
<td>8.8</td>
</tr>
<tr>
<td>Father alone</td>
<td>6.4</td>
<td>7.5</td>
</tr>
<tr>
<td>Grandparents</td>
<td>3.6</td>
<td>4.8</td>
</tr>
<tr>
<td>Others</td>
<td>6.4</td>
<td>5.3</td>
</tr>
<tr>
<td><strong>Occupation of male guardian</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private business</td>
<td>34.5</td>
<td>32.5</td>
</tr>
<tr>
<td>Peasant farmer</td>
<td>23.6</td>
<td>31.6</td>
</tr>
<tr>
<td>Public service</td>
<td>20.0</td>
<td>21.1</td>
</tr>
<tr>
<td>Others</td>
<td>21.8</td>
<td>14.9</td>
</tr>
<tr>
<td><strong>Occupation of female guardian</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peasant farmer</td>
<td>46.8</td>
<td>64.5</td>
</tr>
<tr>
<td>Public service</td>
<td>11.4</td>
<td>14.5</td>
</tr>
<tr>
<td>Private business</td>
<td>27.3</td>
<td>12.3</td>
</tr>
<tr>
<td>Others</td>
<td>14.5</td>
<td>8.8</td>
</tr>
</tbody>
</table>

In schools without a feeding programme, more pupils 74.1% resided in a rural area than 54.1% in schools with a feeding programme. In schools with a feeding programme, 50.9% and 69.7%
of the pupils in schools without a feeding programme had male guardians who had a poor socio-economic status.

In order to test for significant associations between SFP and socio-demographic factors of the pupils, further analysis was done as shown in table 3.

Table 3: Pupils’ Socio-demographic Factors by SFP and their Associations

<table>
<thead>
<tr>
<th>Variables</th>
<th>School Feeding Programme</th>
<th>OR, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SFP Number (n=220)</td>
<td>No SFP Number (n=228)</td>
</tr>
<tr>
<td>Residence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>119</td>
<td>169</td>
</tr>
<tr>
<td>Urban</td>
<td>101</td>
<td>59</td>
</tr>
<tr>
<td>SES for male guardian</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>112</td>
<td>159</td>
</tr>
<tr>
<td>Good</td>
<td>108</td>
<td>69</td>
</tr>
<tr>
<td>SES for female guardian</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>135</td>
<td>167</td>
</tr>
<tr>
<td>Good</td>
<td>85</td>
<td>61</td>
</tr>
<tr>
<td>Live with</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Father and mother</td>
<td>139</td>
<td>168</td>
</tr>
<tr>
<td>Either Father or mother alone</td>
<td>59</td>
<td>37</td>
</tr>
<tr>
<td>Others</td>
<td>22</td>
<td>23</td>
</tr>
<tr>
<td>Location of school</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>100</td>
<td>60</td>
</tr>
<tr>
<td>Rural</td>
<td>120</td>
<td>168</td>
</tr>
<tr>
<td>Ownership of school</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government</td>
<td>180</td>
<td>214</td>
</tr>
<tr>
<td>Private</td>
<td>40</td>
<td>14</td>
</tr>
</tbody>
</table>

* The OR and confidence intervals are significant. SES is socio-economic status. 1.00 is the reference population.

Pupils in schools with feeding programmes were less likely to reside in a rural area than those in schools without a feeding programme. Pupils in schools with a feeding programme were less likely to have both their male and female guardians with a poor SES than those in schools without a feeding programme. Pupils in schools with a feeding programme were less likely to live with either with a father or mother than those in schools without a feeding programme.
Pupils in schools with a feeding programme were more likely to attend schools in urban areas than those in schools without a feeding programme. Other pupil factors were not associated with SFP (see appendix V).

6.2 Nutritional Status of the Pupils

6.2.1 Anthropometric Indices

The derived anthropometric indices were Height-for-age, Weight-for-age and Body Mass Index-for-age. Simple analysis was done to obtain proportions for the different levels of height-for-age, weight-for-age and body mass index-for-age by SFP as shown in table 4.

Table 4: Nutritional Status of Pupils in Schools with and those without a Feeding Programme.

<table>
<thead>
<tr>
<th>Variables</th>
<th>School Feeding Programme</th>
<th>No SFP % (n=228)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SFP % (n=220)</td>
<td></td>
</tr>
<tr>
<td>Height-for-age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stunted</td>
<td>12.7 (28)</td>
<td>20.2 (46)</td>
</tr>
<tr>
<td>Normal</td>
<td>86.4 (190)</td>
<td>78.5 (179)</td>
</tr>
<tr>
<td>Tall</td>
<td>0.9 (2)</td>
<td>1.3 (3)</td>
</tr>
<tr>
<td>Weight-for-age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Underweight</td>
<td>0.9 (2)</td>
<td>5.7 (13)</td>
</tr>
<tr>
<td>Normal</td>
<td>99.1 (218)</td>
<td>93.0 (212)</td>
</tr>
<tr>
<td>Overweight</td>
<td>0.0 (0)</td>
<td>1.3 (3)</td>
</tr>
<tr>
<td>Body Mass Index-for-age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Underweight</td>
<td>3.2 (7)</td>
<td>6.6 (15)</td>
</tr>
<tr>
<td>Normal</td>
<td>83.2 (183)</td>
<td>76.8 (175)</td>
</tr>
<tr>
<td>At risk of overweight</td>
<td>10.5 (23)</td>
<td>10.1 (23)</td>
</tr>
<tr>
<td>Overweight</td>
<td>3.2 (7)</td>
<td>6.6 (15)</td>
</tr>
</tbody>
</table>

A higher proportion of pupils in schools without a feeding programme were stunted and underweight as compared to those in schools with a feeding programme. On further analysis, pupils in schools with a feeding programme were less likely to be stunted and underweight than to those in schools without a feeding programme. These were found to be statistically significant as shown in table 5.
Table 5: Nutritional Status of pupils in Schools and their Associations

<table>
<thead>
<tr>
<th>Variables</th>
<th>School Feeding Programme</th>
<th>OR, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SFP % (n=220)</td>
<td>No SFP % (n=228)</td>
</tr>
<tr>
<td>Height-for-age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>190</td>
<td>179</td>
</tr>
<tr>
<td>Stunted</td>
<td>28</td>
<td>46</td>
</tr>
<tr>
<td>Tall</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Weight-for-age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>218</td>
<td>212</td>
</tr>
<tr>
<td>Underweight</td>
<td>2</td>
<td>13</td>
</tr>
<tr>
<td>Overweight</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Body Mass Index-for-age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>183</td>
<td>175</td>
</tr>
<tr>
<td>Underweight</td>
<td>7</td>
<td>15</td>
</tr>
<tr>
<td>At risk of overweight</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>Overweight</td>
<td>7</td>
<td>15</td>
</tr>
</tbody>
</table>

* The confidence intervals for the OR are statistically significant. 1.00 represents the reference group.

6.2.2 Effect Modification

The effect of a factor of interest or exposure onto the outcome can be modified by another factor. Stratification by suspected confounders was done to check for effect modification. Residence of the pupil was found to modify the effect of SFP on nutritional status as shown in table 6.

Table 6: Residence of pupils as an effect modifier of SFP on body mass index-for-age

<table>
<thead>
<tr>
<th>Effect modifier</th>
<th>Exposure</th>
<th>Body mass index-for-age</th>
<th>OR, 95% CI</th>
<th>$X^2$, p value (interaction)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Not normal</td>
<td>Normal</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>% (number)</td>
<td>% (number)</td>
<td></td>
</tr>
<tr>
<td>Residence</td>
<td>No SFP</td>
<td>85.7 (24)</td>
<td>55.8 (145)</td>
<td>4.76, 1.61-14.10</td>
</tr>
<tr>
<td></td>
<td>SFP</td>
<td>14.3 (4)</td>
<td>44.2 (115)</td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>No SFP</td>
<td>37.5 (6)</td>
<td>36.8 (53)</td>
<td>1.03, 0.35-2.99</td>
</tr>
<tr>
<td></td>
<td>SFP</td>
<td>62.5 (10)</td>
<td>63.2 (91)</td>
<td></td>
</tr>
</tbody>
</table>

* The confidence intervals for the OR are statistically significant.
Residence of the pupils modified the effect of a SFP on body mass index-for-age. In a rural setting, the SFP was significantly associated with body mass index-for-age. This relationship was not significant in the urban setting. Therefore, a SFP would have a greater impact in improving nutritional status of pupils in a rural setting than in an urban setting.

### 6.2.3 Confounding

Logistic regression was done to control for confounders that distort the effect of a SFP on nutritional status of pupils attending primary day schools. The confounders included age, sex, birth order, educational level, having siblings, number of sisters, number of brothers, total number of siblings and survivorship of both parents. Others included occupation of both guardians, socio-economic status of both guardians, number of people at home, distance of school from home, number of meals had in a day, illness in the last 2 weeks, chronic illness, location of school, ownership of school, residence and SFP.

The logistic model that was used is as follows:

\[
\text{Logit } P(Y) = \alpha + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \ldots + \beta_nX_n
\]

Where

Logit P(Y) is the probability of a pupil having an abnormal nutritional status (weight-for-age, height-for-age and body mass index-for-age).

\(\alpha\) is the constant.

\(\beta_1, \beta_2, \beta_3, \ldots, \beta_n\) are the coefficient estimates of the effect of SFP and confounding variables \(X_1, X_2, X_3, \ldots, X_n\) on nutritional status.
Underweight

The possible confounders of the relationship between SFP and weight-for-age were controlled for in multivariate analysis. The best fitting model to the data after backward elimination was applied is shown in table 7.

Table 7: Factors associated with being Underweight

<table>
<thead>
<tr>
<th>Variables</th>
<th>OR</th>
<th>95% CI for OR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.015</td>
<td>-</td>
</tr>
<tr>
<td>11 years and below</td>
<td>0.215</td>
<td>0.630-0.735*</td>
</tr>
<tr>
<td>Primary 5 and below</td>
<td>4.174</td>
<td>1.276-13.660*</td>
</tr>
<tr>
<td>Female guardian employed in the informal sector</td>
<td>0.155</td>
<td>0.037-0.645*</td>
</tr>
<tr>
<td>Poor SES for male guardian</td>
<td>7.107</td>
<td>1.331-37.940*</td>
</tr>
<tr>
<td>No School feeding programme</td>
<td>9.349</td>
<td>1.993-43.845*</td>
</tr>
<tr>
<td>Government owned schools</td>
<td>0.265</td>
<td>0.063-1.108</td>
</tr>
</tbody>
</table>

* The confidence interval for the OR is statistically significant.

Pupils within the age range of 8 to 11 years were less likely to be underweight than those within 12 to 13 years. Pupils whose female guardians were employed in the informal sector were less likely to be underweight than those whose female guardians employed in the formal sector.

Pupils with a lower educational level that is primary four and primary five were more likely to be underweight than those in the higher classes. Pupils with male guardians of poor socioeconomic status were more likely to be underweight than those whose male guardians had a not poor socioeconomic status. Pupils in schools without a feeding programme were more likely to be underweight than those in schools with a feeding programme.
Stunting

The effect of confounding variables that distort the effect of SFP on height-for-age were controlled for in logistic regression and the best fitting model to the data is shown in table 8.

**Table 8: Factors associated with being Stunted**

<table>
<thead>
<tr>
<th>Variables</th>
<th>OR</th>
<th>95% CI for OR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.133</td>
<td></td>
</tr>
<tr>
<td>11 years and below</td>
<td>0.401</td>
<td>0.216-0.747*</td>
</tr>
<tr>
<td>Male</td>
<td>3.033</td>
<td>1.766-5.207*</td>
</tr>
<tr>
<td>Primary 5 and below</td>
<td>1.739</td>
<td>0.964-3.136</td>
</tr>
<tr>
<td>Survivorship of both parents</td>
<td>0.427</td>
<td>0.193-0.943*</td>
</tr>
<tr>
<td>Female guardian employed in the informal sector</td>
<td>0.402</td>
<td>0.183-0.884*</td>
</tr>
<tr>
<td>Poor SES for male guardian</td>
<td>2.502</td>
<td>1.111-5.634*</td>
</tr>
<tr>
<td>&gt;1Kms of school from home</td>
<td>0.590</td>
<td>0.344-1.012</td>
</tr>
<tr>
<td>No School feeding programme</td>
<td>1.652</td>
<td>0.971-2.809</td>
</tr>
</tbody>
</table>

* The confidence interval for the OR is statistically significant.

Pupils within the age group of 8 to 11 years were less likely to be stunted than the older pupils. Pupils with both parents alive were less likely to be stunted than those who had either one parent or no parent. Pupils whose female guardians were employed in the informal sector were less likely to be stunted than those whose female guardians were employed in formal sector.

Male pupils were more likely to be stunted than the females. Pupils whose male guardians had a poor socioeconomic status were more likely to be stunted than those whose male guardians were of a not poor socioeconomic status. Pupils in schools with no feeding programme were more likely to be stunted than those in schools with a feeding programme. However, this was not found to significantly affect the probability of pupils being stunted.
Underweight and Overweight as determined by Body Mass Index-for-age

A number of models were run with the outcome dichotomised in such a way that the extreme levels of body mass index-for-age were combined to form abnormal body mass index. However, the findings were difficult to interpret. Therefore, two models were run with the different outcomes of interests that is underweight and overweight. After backward elimination, the best fitting model to the data is shown in table 9 and 10.

Table 9: Factors associated with being Underweight

<table>
<thead>
<tr>
<th>Variables</th>
<th>OR</th>
<th>95% CI for OR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.011</td>
<td></td>
</tr>
<tr>
<td>11 years and below</td>
<td>4.686</td>
<td>1.662-13.217*</td>
</tr>
<tr>
<td>Male</td>
<td>0.257</td>
<td>0.102-0.649*</td>
</tr>
<tr>
<td>&lt; 3 meals taken a day</td>
<td>0.343</td>
<td>0.110-1.065</td>
</tr>
<tr>
<td>Government owned school</td>
<td>5.153</td>
<td>0.615-43.165</td>
</tr>
<tr>
<td>No School feeding programme</td>
<td>2.694</td>
<td>0.886-8.186</td>
</tr>
</tbody>
</table>

* The confidence interval for the OR is statistically significant.

Male pupils were less likely to be underweight as compared to female pupils. Pupils aged 11 years and below were more likely to be underweight as compared to the older pupils.

Table 10: Factors associated with being Overweight

<table>
<thead>
<tr>
<th>Variables</th>
<th>OR</th>
<th>95% CI for OR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.320</td>
<td></td>
</tr>
<tr>
<td>11 years and below</td>
<td>0.213</td>
<td>0.071-0.644*</td>
</tr>
<tr>
<td>Male</td>
<td>0.355</td>
<td>0.129-0.974*</td>
</tr>
<tr>
<td>&lt; 3 meals taken a day</td>
<td>0.313</td>
<td>0.117-0.834*</td>
</tr>
<tr>
<td>Government owned school</td>
<td>0.146</td>
<td>0.048-0.448*</td>
</tr>
<tr>
<td>No School feeding programme</td>
<td>3.320</td>
<td>1.112-9.913*</td>
</tr>
</tbody>
</table>

* The confidence interval for the OR is statistically significant.
Pupils 11 years and below were less likely to be overweight as compared to the older pupils. Male pupils were less likely to be overweight as compared to the female pupils. Pupils who had less than 3 meals a day were less likely to be overweight than those who had 4 and more meals. Pupils in government owned schools were less likely to be overweight than those in privately owned schools.

Pupils in schools without a feeding programme were more likely to be overweight than those in schools with a feeding programme.

6.3 Dietary patterns of the Pupils

6.3.1 Provision of Meals by Schools to Pupils

Pupils in schools with a feeding programme were asked information regarding the meals that are provided by SFP as shown in figure 2.

Figure 2: Percentage distribution of pupils who received meals provided by schools
Lunch was provided to most pupils 81.8 (180/220) in schools with a feeding programme. The food provided by the SFPs to the pupils 100% (220) in schools with a feeding programme was mainly maize porridge with no sugar and milk.

6.3.2 Provision of Breakfast to Pupils

The pupils in both schools with a feeding programme and those in schools without a feeding programme were compared to find a statistical association between SFP and having breakfast as shown in table 11.

Table 11: Provision of breakfast to the pupils in schools with and without a feeding programme.

<table>
<thead>
<tr>
<th>Variables</th>
<th>School feeding programme</th>
<th>OR, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SFP (%)</td>
<td>Non SFP (%)</td>
</tr>
<tr>
<td>Having breakfast before coming school (n=220)</td>
<td>(n=228)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>80.0 (176)</td>
<td>76.8 (175)</td>
</tr>
<tr>
<td>No</td>
<td>20.0 (44)</td>
<td>23.2 (53)</td>
</tr>
<tr>
<td>For those who had breakfast before coming to school:</td>
<td>(n=176)</td>
<td></td>
</tr>
<tr>
<td>Place where it was provided</td>
<td></td>
<td>(n=175)</td>
</tr>
<tr>
<td>At home</td>
<td>100.0 (176)</td>
<td>98.9 (173)</td>
</tr>
<tr>
<td>Bought on the way to school</td>
<td>0.0 (0)</td>
<td>1.1 (2)</td>
</tr>
</tbody>
</table>

In both schools with and without a feeding programme, most of the pupils had breakfast before coming to school at home. However, there was no statistical significant association between SFP and having breakfast before coming to school.
6.3.3 Frequency of Food Intake

The pupils were asked for information on the average number of meals had on a daily basis so as to describe their feeding habits as shown in figure 3.

Figure 3: Percent distribution of pupils according to the number of meals taken a day

In schools without a feeding programme, 64.5% of the pupils had 3 meals and less a day than those in schools with a feeding programme. Pupils in schools with a feeding programme were less likely to have 3 meals and less than those in schools without a feeding programme (OR=0.11, 95% CI: 0.06-0.19*).

Parents in most FGDs in both schools with and without a feeding programme suggested that the children should be fed twice a day at school. They should be given maize porridge for morning break and for lunch, posho and beans.
6.3.4 Specific Meals taken in a day

Information on the meals taken in a day was obtained from the pupils using the 24 hour recall method. Significant associations were tested for at bivariate analysis.

Table 12: 24 hour food recall of meals taken by pupils and the Associations

<table>
<thead>
<tr>
<th>Meals had in a day</th>
<th>School feeding Programme</th>
<th>OR, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SFP % (n=220)</td>
<td>No SFP % (n=228)</td>
</tr>
<tr>
<td>Breakfast</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>80.9 (178)</td>
<td>77.6 (177)</td>
</tr>
<tr>
<td>No</td>
<td>19.1 (42)</td>
<td>22.4 (51)</td>
</tr>
<tr>
<td>Morning break</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>45.5 (100)</td>
<td>8.3 (19)</td>
</tr>
<tr>
<td>No</td>
<td>54.5 (120)</td>
<td>91.7 (209)</td>
</tr>
<tr>
<td>Lunch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>99.5 (219)</td>
<td>82.5 (188)</td>
</tr>
<tr>
<td>No</td>
<td>0.5 (1)</td>
<td>17.5 (40)</td>
</tr>
<tr>
<td>Evening break</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>54.1 (119)</td>
<td>24.1 (55)</td>
</tr>
<tr>
<td>No</td>
<td>45.9 (101)</td>
<td>75.9 (173)</td>
</tr>
<tr>
<td>Supper</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>97.3 (214)</td>
<td>94.3 (215)</td>
</tr>
<tr>
<td>No</td>
<td>2.7 (6)</td>
<td>5.7 (13)</td>
</tr>
</tbody>
</table>

*The confidence interval for the OR is statistically significant.

Using the 24 hour recall method, the pupils were asked about the foods they had eaten the previous day for all the meals taken in a day. The findings were that pupils in schools with a feeding programme were more likely to have morning break, lunch and evening break as compared to those in schools without a feeding programme.

6.3.5 Adequacy of Food Intake

Information on food adequacy was collected using the 24 hour recall method on food intake and then it was scored for food adequacy. The information of food intake was examined to determine whether the foods eaten for the three main meals were balanced or not.
Table 13: Adequacy of food Intake of Pupils in Schools with and without a Feeding Programme

<table>
<thead>
<tr>
<th>Meals had in a day</th>
<th>School feeding Programme</th>
<th>No SFP %</th>
<th>OR, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SFP % (n=176)</td>
<td>No SFP % (n=177)</td>
<td></td>
</tr>
<tr>
<td>Breakfast</td>
<td></td>
<td></td>
<td>0.57, 0.23-1.44</td>
</tr>
<tr>
<td>Not balanced</td>
<td>91.5 (161)</td>
<td>94.9 (168)</td>
<td></td>
</tr>
<tr>
<td>Balanced</td>
<td>8.5 (15)</td>
<td>5.1 (9)</td>
<td></td>
</tr>
<tr>
<td>Lunch</td>
<td></td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Not balanced</td>
<td>100.0 (219)</td>
<td>93.1 (175)</td>
<td></td>
</tr>
<tr>
<td>Balanced</td>
<td>0.0 (0)</td>
<td>6.9 (13)</td>
<td></td>
</tr>
<tr>
<td>Supper</td>
<td></td>
<td></td>
<td>1.10, 0.42-2.87</td>
</tr>
<tr>
<td>Not balanced</td>
<td>95.3 (204)</td>
<td>94.9 (204)</td>
<td></td>
</tr>
<tr>
<td>Balanced</td>
<td>4.7 (10)</td>
<td>5.1 (11)</td>
<td></td>
</tr>
</tbody>
</table>

* The confidence interval for the OR is statistically significant.

Table 13 shows that for the 3 main meals taken in the day that are breakfast, lunch and supper. Majority of pupils in both schools with a feeding programme and those in schools without a feeding programme had unbalanced meals. However, there was no significant association between SFP and meals taken a day.

6.3.6 Copping Measures in lieu of School Lunch

Pupils in schools without a feeding programme were asked information on copping measures for lunch as shown in figure 4.
Figure 4: Percent distribution of pupils in schools without a feeding programme by coping measures for lunch.

Most of the pupils 69.7% (159) in schools without a feeding programme go back home for lunch.

6.4 Perceptions of the Parents about SFPs

6.4.1 Perceived Benefits of Provision of Meals to Pupils at School

All focus group discussions (8/8) comprising of parents were generally aware of the perceived benefits of providing meals to pupils while at school. The benefits mentioned included regular school attendance, improved academic performance, improved physical and mental growth, prevention of accidents such as broken limbs as a result of children climbing trees looking for fruits, prevention of children from stealing food from the neighboring gardens or packed food for other pupils.

The parents felt that the SFPs encouraged children to attend school regularly because the food acts as a bait. In addition, they also believed that with SFPs in place, the parents are able to concentrate on their work other than having to worry about their children and also having to go
back home to prepare food for lunch for their children. Another benefit was that providing food at school helps children who are unable to go back home for lunch because they stay far away from school. They also believed that providing food to school children enables them to grow and develop physically and mentally.

The children are able to concentrate in class and therefore understand what is being taught in class because they are settled in class as shown by a comment from one of the FGD participant “Sending children to school and they do not feed is a waste of time because the teachers demand that they learn what is being taught and yet the child is unable to learn. That is why I would say that UPE has not done any work because the children are not feeding” (Male FGD participant, Budondo Sub County).

The children are generally happy and lively when at school. In some cases, a SFP would help children from broken homes and those who are mistreated when home. “Our families have bastards who are treated differently from other children. Therefore, if there is a chance of having a better meal at school, it would assist such a child who is all the time tortured at home” (Male FGD participant, Jinja Municipality East).

6.4.2 Participation of Parents in School Feeding Programmes

All FGDs (8/8) for parents agreed that they should participate in SFP. “If we participate, there is a sense of ownership of feeding programme therefore we do not concentrate on blaming the teachers or the government that they are not feeding our children” (Male FGD participant, Budondo Sub County).
The ways of participation suggested by the focus group discussions were by contributing money for buying food for the children, contributing a specified amount of food like maize, beans and any other by monitoring the performance of school feeding programmes in terms of the types of food provided, its quality and variety.

6.4.3 Measures of Improving School Feeding Programmes

From the focus group discussions, the parents suggested ways of improving the SFP such as sensitization of stakeholders on importance of feeding, encouraging collaboration between stakeholders, and their participation in the SFP as follows:

Sensitization of the stakeholders concerned with the SFP from the grass roots that is the parents, the teachers and the government. One of the FGD participants was concerned about support from their husbands. “We would like to plead to our husbands to have a concerted effort with us as we try to improve on the feeding of our children in school” (Female FGD participant, Budondo Sub County).

Encouraging collaboration between the Government of Uganda and the parents such that both the government and the parents to contribute to the SFP. One of the participants had this to say “As parents, this is an issue where I think it is important for us to put something in place such that the government has a basis upon which to give us assistance because feeding children is a duty which should start with us parents” (Male FGD participant, Budondo Sub County). Joint effort between both parents and school administration would also improve SFPs. The parents felt that forming committees responsible for overseeing feeding of children at school would also be another way to improving the performance of SFPs.
6.5 Perceptions of School Administration about SFP

6.5.1 Perceived Benefits of SFP
The perceived benefits of SFP by the all key informants included improved academic performance and health, motivation to learn, regular school attendance, promote discipline, strengthen teacher-pupil relationship and others further described.

The key informants believed that SFPs create and also strengthen the relationship between the school staff and children. In addition, SFP would promote discipline in children because they do not steal food from fellow children and also from the neighboring gardens. They would encourage good eating habits in the children since they would eat together and also they would learn more information about healthy eating which would be shared with their guardians. The SFPs alleviate hunger and therefore the children can be easily controlled. They also encourage better time management in school because the children would not waste a lot of time going to and fro home for lunch. The parents believed that SFPs improved health and wellbeing of the children and also their academic performance of the children since they are motivated to learn. Lastly, the SFPs encouraged regular attendance of school because the food acts as a bait.

6.5.2 Stakeholders in the SFP
The stakeholders in the SFP included the school administration, parents and the pupils. Each of them play a role in SFP as follows:

The School administration mobilized and sensitized the parents about the importance of feeding their children while at school and supervised food preparation. They also provided containers for food preparation, purchased fuel and paid the workers and collected food or money from the parents for feeding the children.
The Parents contributed for meals in form of money or kind and supervised and at times are involved in food preparation.

Pupils were the beneficiaries of the programme, they also educated their parents on the importance of feeding and cleaned their utensils used for eating.

6.5.3 Situation of School Feeding Programmes

The performance of SFP was poor as mentioned by most (16/27) school administration. "The situation is really alarming because most schools do not have SFPs" (Key Informant Deputy Head Teacher, Buwenge Sub County).

Reasons given were lack of adequate funds and parents ignorance about the importance of school feeding. Others were that the government made the provision of meals at school optional such that parents were reluctant to pay for feeding their children and the parents misunderstood the UPE system that they believe that the government should provide meals. The parents are not willing to pay. "The situation is still poor because parents are not willing to pay for pupils' meals and there is a big resistance from parents when told to pay for meals because they know everything at school is supposed to be free" (Key Informant Head Teacher, Buwenge Sub County).

6.5.4 Improvement of School Feeding Programmes

The ways suggested by the key informants to improve the SFPs were clear policy formulation on school feeding, sensitization of the public, assistance from the government, setting up of monitoring teams and school gardens.
The parents felt that the concerned policy makers should be able to make clear policies on feeding of school children that are suitable to the situation. Also the public should be sensitized about the benefits of providing food to school children while at school. Monitoring teams should be set up at the district level to supervise and oversee the progress of SFPs at the district level. They felt that the Government of Uganda should assist in facilitating and sustaining the SFP. One of the participants said that "since the government introduced UPE to the pupils, it should also provide food to the pupils. If the government can not provide food, it should sensitize the parents about the advantages of SFP" (Key Informant Head Teacher, Buwenge Sub County).
CHAPTER 7

7.0 Discussion

7.1 Introduction

Uganda is implementing the UPE programme that has created great opportunities for a large number of Ugandan children to attend primary school. These children are a key resource for a better future. With the right nutrition, education and care, they can become valuable contributors to the nation's wealth and security. To achieve UPE, good nutritional status of school children is crucial.

7.2 Nutritional Status of Pupils

7.2.1 Underweight

In this study, the nutritional status of pupils in schools with a feeding programme and those in schools without a feeding programme was compared. On further analysis, pupils in schools without a feeding programme were more likely to be underweight than those in schools with a feeding programme. This may be explained by mainly environmental factors influencing nutritional status of pupils such as a considerable number of pupils in schools without a feeding programme did not have lunch, morning and evening break while at school as compared to those in schools with a feeding programme.

Other factors explaining the relationship were that pupils in schools without a feeding programme had more siblings and more people living with them at home as compared to those in schools with a feeding programme. This meant that there were many people at home to feed and therefore, each individual may get less of the resources required including food, nurturing and health care which have an impact on nutritional status of the pupils.
Pupils in schools with a feeding programme were less likely to live in a rural area as compared to those in schools without a feeding programme. Rural areas are characterized by poor access to health services, poverty, poor hygiene and sanitation and lack of adequate food which have a negative impact on nutritional status.

More than half of the pupils in schools without a feeding programme had male and female guardians who had a poor socioeconomic status as compared to those in schools with a feeding programme. This may result into lack of access to vital resources such as food, health services, education and credit which eventually lead to a vicious cycle of malnutrition.

Another factor explaining the relationship between SFP and underweight was that this study was done after the long December 2003 to February 2004 holiday. Therefore the pupils in schools without a feeding programme may have been exposed to short term harsh conditions of no food being provided at school resulting into pupils having to walk back home for lunch which in turn influences their nutritional status.

These findings were similar to another study done in Karnataka in India by Laxmaiah et al (1999). However, this was not the case in a similar study done in Nyambene in Kenya by Meme et al (1998). This may have been due to irregularity of the school feeding programme and selection bias which could have been introduced by purposive selection of school with no feeding programme.
7.2.2 Stunting

Pupils in schools without a feeding programme were more likely to be stunted than those in schools with a feeding programme at bivariate analysis. On further analysis, SFP was not a significant predictor for being stunted. This finding is different from what was found in a similar study done in Karnataka in India by Laxmaiah et al (1999). This could be due to differences in the SFPs such as implementation, amount of ration, duration of the feeding programme and the characteristics of the beneficiaries of the SFPs.

The finding in this study compares to that in a similar study done in Nyambene in Kenya by Meme et al (1998). This was expected because stunting does not change over a short time and it indicates a cumulative process of poor growth that primarily occurs before the age of 3 years which may be due to high rates of infection and inadequate nutrition which is related to poor weaning practices and poor dietary quality. After 3 years, the linear growth of poor children may be similar to that for the well nourished children (Adair, 1999). Stunting may be explained by long term effects of inadequate protein and energy intake, frequent infections, sustained inappropriate feeding practices and poverty. However, should the environment of children improve, they can exhibit catch up growth (UNSCN, 2002).

7.2.3 Underweight and Overweight as determined by Body Mass Index-for-age

In simple analysis, pupils in schools with a feeding programme were less likely to be underweight as determined by body mass index-for-age than those in schools without a feeding programme. This was not statistically significant. On further analysis, the relationship remained statistically insignificant implying that a SFP was not a significant predictor for underweight as determined by body mass index-for-age which is equivalent to wasting for weight-for-height.
Underweight or wasting reflects acute under nutrition and is associated with failure to gain weight or loss of weight. This could be due to a recent and severe process that may have led to a substantial loss in weight which is usually as a consequence of acute shortage of food or severe disease for instance the period of one month from the time school opened, pupils in schools without a feeding programme either had no lunch at all or walked a distance home and back. The meals provided at school composed of mainly maize porridge with no sugar and milk and therefore, they were poor in quality. The meals at home may have been poor in quality as shown by more than half of pupils in both school populations having unbalanced meals for the three main meals taken a day.

This finding is different from a similar study done in Nyambene in Kenya by Meme et al (1998). This difference in similar studies in areas which are fairly comparable may be explained by variations in implementation of feeding programmes such as regularity in provision of meals and lower dietary intake at home for pupils in schools with a feeding programme. The finding of this study also differed from that in a similar study done in Karnataka, India by Laxmaiah et al (1999) probably due to the fact that the SFP in India could have been well organized and implemented and also the ration provided to the school children was standardized which was not the case in the school feeding programmes in Jinja District.

Another reason could be due to differences in socio-demographic characteristics of the beneficiaries in India and Uganda. However, body mass index-for-age may distort the true nutritional picture (Personal communication from Professor Kakitahi, Makerere University Institute of Public Health, 2004).
There was no statistical significant association between SFP and overweight at simple analysis. On further analysis, pupils in schools without a feeding programme were more likely to be overweight than those in schools with a feeding programme. This may be explained by the fact that pupils in schools without a feeding programme may be practicing poor feeding habits such as eating unbalanced meals with respect to all the required nutrients. However, there are still methodological concerns about the use and interpretation of weight-for-height in populations with significant levels of stunting (Martorell, 2002) which is comparable to body mass index-for-age (CDC, 2002).

Other reasons are that Body Mass Index-for-age is an effective tool for screening but not for diagnosis (CDC, 2002) which is a limitation. A high level of stunting is believed to be a risk factor for overweight in countries undergoing nutrition transition which may be explained by the relationship of stunting to under nutrition (UNSCN, 2002).

Another reason is that the pupils were from a long holiday from December 2003 to February 2004, which probably may explain overweight since during this long holiday, they may have had reduced activity patterns and poor diets mainly composed of high fat and low carbohydrates. The onset of adolescence could be earlier in pupils in schools without a feeding programme. Adolescence is a period of accelerated growth due to hormonal changes which is faster than any other time in an individual's post natal life apart from the first year (Brasel, 1982) and therefore explaining overweight.

The findings show that SFP may have the potential of improving nutritional status if well designed and implemented and this is comparable to similar findings in other similar studies by Chen (1989) in Ulu Selangor, Powell et al (1998) in Jamaica, (Laxmaiah et al, 1999) in India,
(Partnership for Child Development, 1999) in Indonesia, Rewal in India and (Satoto, 1993) in Indonesia.

However, some similar studies found no significant improvement in nutritional status. For example, Simeon (1998) found no difference in weight gain in pupils with the school feeding programme in Jamaica. However, confounding may not have been totally ruled out. In Jamaica, Chambers (1991) found that the school breakfast programme had no discernible effect on nutritional status. In Kenya, Meme et al (1998) found that wasting prevalence was significantly higher in pupils in schools with a feeding programme than those in schools without a feeding programme. Underweight and stunting were not significantly different in the two groups. The authors stated that it could have been due to irregularity of the school feeding programme and low dietary at home for children in schools with a feeding programme. It also may be due to selection bias introduced by purposive selection of the no feeding programme school.

The finding that pupils in schools without a feeding programme were more likely to be underweight than those in schools with a feeding programme indicates that the children in schools with a feeding programme may have a better nutritional status than those in schools without a feeding programme. Underweight as determined by weight-for-age reflects both acute and chronic under nutrition (UNSCN, 2002). Therefore, the null hypothesis that the pupils attending primary day schools with and without a SFP have the same nutritional status is rejected. It is important to note that given the limitations of the study design, we cannot for sure tell that SFPs improve nutritional status of the pupils.

Residence was the only effect modifier found to modify the effect of the SFP on body mass index-for-age of the pupils. This relationship showed that a SFP would have a greater impact in
improving the nutritional status of pupils in a rural setting than in the urban setting. This may be explained by better feeding programmes in the rural schools than in the urban schools. Probably, the effect of a SFP may be more pronounced in pupils in a rural area than in an urban area because the pupils could be more likely to be malnourished. Therefore, it may be important to implement SFP targeting pupils in the rural setting because they may be from homes that are food insecure that may lack sanitation and safe water, that may be of a low socioeconomic status and that may lack adequate access to health facilities thus making them more likely to be under nourished.

7.2.4 Other factors influencing Nutritional Status of Pupils

Factors that were significant predictors for underweight were pupils' age, their educational level and socio-economic status of the male guardian. Pupils' age, their sex, survivorship of both parents, occupation of female guardian and socioeconomic status of the male guardian were significant predictors for stunting; age and sex were significant predictors of underweight as determined by body mass index-for-age and age, sex, number of meals and ownership of school were significant predictors for overweight.

Pupils 11 years and below were less likely to be underweight, stunted and overweight than the older pupils. This finding was similar in other studies done in Ghana, Tanzania, Indonesia, Vietnam and India by Partnership for Child Development (1998) and in Islamabad in Pakistan by Mian et al (2002). In Nyambene district in Kenya, Meme et al (1998) also found that age had a significant negative relationship with underweight and wasting in both groups of children. This may be explained that younger children in homes could be assured of food at every meal than the older ones how ever little the food may be in the house. This finding indicates that linear growth continues to falter throughout the school age years. In the older children, malnutrition
has serious short and long term implications such as impaired cognitive and behavioral development leading to educational failure.

Pupils with a lower educational level that is primary five and below were more likely to be underweight and stunted than those in the higher classes. This may be explained by a big proportion of the older pupils in the lower classes as a result of introduction of free Universal primary education. However, educational level was not a statistically significant predictor for stunting implying that at the different education levels, the prevalence of stunting is about the same and there could be a similar distribution of pupils within the same age range at the different levels of education.

Pupils whose female guardians were employed informally were less likely to be underweight and stunted than those whose female guardians were employed in the formal sector. This may be due to the fact that most of the female guardians employed in the informal sector may have more time to prepare food for the family, to care for the children and family, incase of a sick child, they have the time to seek adequate health care as compared to those employed in the formal sector. The female guardians employed in the formal sector may be commuting great distances from work, may be spending most of their time commuting to and from work and may have less time to prepare meals and to care for the family such that they may delegate these responsibilities to a relative or house helper who may lack experience in child caring.

Pupils whose male guardians had a poor socio-economic status were more likely to be underweight and stunted than those who had a not poor socio-economic status. This finding was similar to those in other studies by Shariff, Bond and Johnson (2000) in Kuala Lumpur and Mian et al (2002) in Pakistan. In the African context, the male guardian in a home is the bread
winner and therefore he is expected to provide for the family. People with a poor socioeconomic status would be unable to provide adequate food and other basic requirements for healthy living that influence the nutritional status. The socioeconomic status index is relevant only to this study. However, not all the key components of socioeconomic status were used in creating the aggregate index because of difficulty in collecting information on education attainment of the guardians and family income from young children within the age of 8-13 years and therefore incapable of providing accurate and reliable information.

Male pupils were more likely to be stunted than the females. This agrees with findings in other studies by Shariff, Bond and Johnson (2000) in Kuala Lumpur Malaysia, Partnership for Child Development (1998) in Ghana, Tanzania, Indonesia, Vietnam and India, Fernando et al (2000) in Sri Lanka and Meme et al (1998) in Nyambene in Kenya also found that more boys were stunted, underweight and wasted as compared to the girls. This may be due to the fact that the girls are socially involved in food preparation and therefore have a greater access to food than the boys and also that the onset of puberty is delayed in the boys as compared to the girls. Another reason could be that boys have higher nutritional demands than the girls such that if faced with food insecurity, their nutritional needs would not be met and therefore they would be more likely to be undernourished.

Pupils with both parents alive were less likely to be stunted than those who either had one or none because both parents in a home are able to contribute more towards the household income than a single parent or none and therefore are able to afford enough food for the family, medical services for treatment of illness and other basic requirements for healthy living.
Pupils who had less than 3 meals a day were less likely to be overweight than those who had 4 and more meals. This indicates that the children were having the required number of meals for a day that is 2 to 3. Ideally, children require 2 to 3 balanced meals a day (King and Burgess, 2000) to meet their nutritional needs. However, most of the pupils had unbalanced diets for the 3 main meals in a day indicating that they had poor feeding practices and therefore the nutritional needs of the body may not be adequately met resulting into nutritional and health problems. A meal including foods from several food groups provides the most benefits to the children both educationally and physically. However, the quantity of the food eaten by the pupils was not determined in the study and therefore it is not known if the foods eaten meet the recommended daily requirements of the body.

Pupils in government owned schools were less likely to be overweight than those in privately owned schools. The government schools provide free universal primary education to children from homes that may not afford for primary education. These homes may be characterised by a low socioeconomic status, poverty, food insecurity, poor sanitation and living conditions which in turn have an impact on nutritional status.

7.3 Dietary Patterns of Pupils

In both schools with and without a feeding programme, most of the pupils had breakfast before going to school at home. This is a good practice because their health needs at the beginning of the day and their educational needs in terms of ensuring children start the school day on time well nourished and settled are met. Breakfast contributes significantly to the overall nutrient intake for the day such that if a pupil misses breakfast, he or she is unlikely to replace the nutrient deficit throughout the day. Missing breakfast has adverse effects on physical performance, some aspects of cognitive function in children and nutritional consequences.
(Kruger). The performance of children who go to school without breakfast goes down by about 0.1 standard deviation (4 percentiles) but only if they are malnourished or from poor backgrounds (Jukes et al, 2002).

Most pupils in schools without a feeding programme had 3 meals and less as compared to those in schools with a feeding programme. This may be explained by almost half of the pupils in schools without a feeding programme had more siblings and more people living with them at home. Therefore, they were many at home such that feeding them would have been a problem resulting into each child getting less of the required resources such as food and also having a fewer number of meals in a day as shown by the fact that most of them did not have morning and evening break while at school.

Other explanations were that most pupils had both female and male guardians with a poor socioeconomic status. Therefore, they could have been unable to provide all the meals required in a day. However, more pupils in schools with a feeding programme had more than four meals a day as compared to those in schools without a feeding a programme. This may be explained by the additional school meal on top of the meals provided at home.

A higher proportion of pupils in schools without a feeding programme did not have morning and evening break as compared to those in schools with a feeding programme because most were from homes of poor socioeconomic status with more people living with them at home as compared to the pupils in schools with a feeding programme making it difficult for the guardians to provide adequately for their children even while at school. A higher proportion of pupils in schools with a feeding programme had lunch as compared to those in schools without a feeding programme because the pupils in schools with a feeding were assured of lunch
provided by the school. Therefore, it is important that a school provides a meal to children while at school. This way, they are assured of at least a meal in a day.

In both schools with and without a feeding programme, the pupils did not have a balanced diet for the 3 main meals in day which were breakfast, lunch and supper meaning that probably all the nutritional needs of the pupils were not being met. The poor feeding practices may be explained by that more than half of the pupils lived in a rural area with both guardians with a poor socioeconomic status who probably lacked the basic knowledge on the importance of eating a balanced meal.

All pupils in schools with a feeding programme had an unbalanced meal for lunch which was provided by the school as compared to those in schools without a feeding programme whose lunch was provided from home. This is supported by the fact that most of the key informants believed that the SFPs were performing poorly. This could be due to poor management and organization of the SFPs, lack of adequate resources to implement a better feeding programme, insufficient knowledge on healthy eating and poor participation of the parents in the feeding programme. However, the study did not determine the caloric and protein intake for the pupils in schools with and without a feeding programme so as to find out if the protein and energy recommended dietary allowances were being met by the foods being eaten.

7.4 Parents' Perceptions about SFPs

The focus group discussions of parents generated information on their perceived benefits of SFPs and this showed that the parents had positive perceptions about a SFPs. They believed that these SFPs had many benefits. The benefits of SFPs have been proven in a number of studies such as Chang et al (1996) in Jamaica, Pollitt et al, (1995) in Peru, Wyon et al (1997)
in Sweden, Meyers et al (1989) in USA, (Pollitt et al, 1995) in Peru, (Moore, 1994) in Burkina Faso and WFP (1996) in Malawi. Taking into consideration of the numerous benefits of SFPs and parents' positive perceptions about SFPs, they should be advocated for, implemented and sustained such that these benefits and the objectives of SFPs are realized. The authorities concerned with SFPs should take advantage of the parents' positive perceptions about SFPs such that their children while at school are well catered for.

The parents were willing to participate in the SFPs which showed commitment towards a common cause of helping their children. The suggested ways they could take part in the SFPs were by contributing money for buying food, by contributing in kind and monitoring the performance of the SFPs. Involvement of the parents in the SFPs would create a sense of ownership and therefore sustainability of the feeding programmes such that they are able to achieve the short and long term objectives of the SFPs.

7.5 School Administrations’ Perceptions about SFPs

The perceived benefits of SFPs mentioned by the school administration were similar to those mentioned by the parents in the focus group discussions. This finding on perceived benefits of SFPs are similar to findings in similar studies by (Morgan-Brown, 2003) in Connecticut, Pietzsch (2003) in Sri Lanka and Peterson et al (2003) in Minnesota. It is important that the SFPs are well implemented and scaled up to other areas that do not have feeding programmes such that the pupils benefit since they are our leaders for tomorrow.

The various stakeholders in the SFPs currently existing were the school administration, the parents and pupils who were the beneficiaries. Each stakeholder in the SFPs plays an important role. This encourages community participation. SFPs that have the community
involved in organization and implementation have certain advantages such as increased contact and communication among the parents, teachers and other stakeholders, increased awareness on the part of the parents about school activities and raising the value of education (Partnership for Child Development, 1999).

However, the SFPs were said to be performing poorly by most of the school administration as a result of lack of adequate funds to run the SFPs, ignorance of the parents about the importance of school feeding, misunderstanding the concept of UPE in that the parents believe that it's the responsibility of government to provide the meals to the school children and lastly that the parents are reluctant to pay for feeding their children while at school because the government made payment for meals optional since not all parents could afford. There is a need to set up measures to improve on the existing school feeding and then finally scaling up to other areas without feeding programmes.
CHAPTER 8

8.0 Conclusions

The prevalence of underweight was higher in schools without a feeding than in those with a feeding programme. Therefore, pupils in schools with a feeding programme had a better nutritional status than those in schools without a feeding programme.

The pupils practice poor feeding habits because majority of pupils in schools with and without a feeding programme had unbalanced meals for the main meals in a day and this even is worse for pupils in schools without a feeding programme who are more likely not have morning and evening break and lunch in a day on top of eating unbalanced meals.

Both parents and school administration had positive perceptions about the present SFPs.
CHAPTER 9

9.0 Recommendations

- The SFPs can first target the pupils mainly in the rural areas and can be scaled up to the urban areas in the future taking into consideration that the parents may have varying levels of socioeconomic status. They can either contribute money or in kind.
- The District Health Team should educate the public about the nutrition.
- The meals provided by the SFPs were inadequate in nutrients therefore, the SFPs can be improved by having school demonstration plots for nutrition education and also for growing foods that supplement foods provided at school.
- Ministry of Education and Sports and other stakeholders should sensitize the parents and other stakeholders about the UPE guidelines on feeding school children.
- The Government of Uganda could collaborate with the parents such that they both play a role in the SFPs since most of the pupils at risk to health problems are enrolled in UPE schools.
- In schools with feeding programmes, parents can form committees responsible for monitoring the SFPs to improve their performance and encourage a sense of ownership that is a pillar to sustainability of these programmes.
- All stakeholders should be sensitized by the concerned authorities in government about the SFPs from the grass roots that is the parents, the teachers and the government about the importance of school feeding.
- Another study on establishing the effect of SFPs integrated with other health interventions such as nutrition education or de-worming on nutritional status is recommended.
- A longitudinal study is recommended to examine the greater impact of improving nutritional status of pupils by SFPs in a rural setting than those in an urban setting.
References


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Rewal S. Results of a school lunch programme in India. CARE- India, India.


Appendices

Appendix 1

Informed Consent Form for the Parent or Legal Guardian

Good Morning/ Afternoon, Madam/ Sir,

We are from the office of District Director of Health Services, Jinja District and Makerere University Institute of Public Health, Kampala. We are conducting a study on the effect of school feeding programmes on the nutritional status of pupils in primary day schools in Jinja district.

The purpose of this study is to assist the District Health Team of Jinja District and other stakeholders to plan appropriate interventions that will advocate, promote, support and improve nutrition in primary schools.

We are kindly requesting you to let your child to participate in the study. When the child is enrolled in the study, we shall measure their height and weight and then ask them questions. This study will not cause any harm to your child but you are free not to allow your child to participate or even withdraw your child during the course of the study.

This information will be strictly confidential and will be used only for purposes of this study.

Thank you very much.

Date...........................................................................................................

Signature of Respondent...........................................................................

Signature of Interviewer...........................................................................
Appendix II

Questionnaire (To be administered to the pupil)

Pupil No........................
Name of the Interviewer..............................
Date..............................

Name of the school ...........................................
County .....................................................
Sub county ...................................................

1. Weight 1)......... 2) ............. (Kilograms to the nearest tenth of a kg)
2. Height 1)......... 2) ............. (Centimetres to the nearest 0.5 cm)
3. Age............. (Years)
4. Sex 1) Female 2) Male
5. What is your tribe?
   1= Soga
   2= Ganda
   3= Others, specify..............................
4. What is your birth order?
   1) First 2) Second 3) Third 4) Others, specify ..............
5. What is your religion?
   1) Catholic 2) Protestant 3) Moslem 4) Others, specify .........
6. What is the stream/class you attend? ..................
7. Do you have brothers and sisters?
   1) Yes 2) No
8. If yes, how many do you have?
   Brothers.......................... Sisters .....................
9. Are both your parents alive?
   1) Yes 2) No
10. If no, is anyone of your parents alive?
    1) Yes 2) No
11. If yes, which one?
    1) Father 2) Mother
12. Who do you live with?
   1) Father and Mother
   2) Father alone
   3) Mother alone
   4) Grand parents
   5) Others, specify ..................................................

13. What is the occupation of your parents or guardians?
   a) Father
      1) Peasant farmer   2) Public service  3) Private business
      4) Others, Specify ............................................
   b) Mother
      1) Peasant farmer   2) Public service  3) Private business
      4) Others, Specify ............................................

14. How many people live with you at home (total number)?

15. What is the distance of school from home?
   1) < 1Kms   2) 1.1 – 2.0 Kms   3) 2.1 – 3.0 Kms   4) > 3.0 Kms

16. Did you have breakfast before coming to school today?
   1) Yes       2) No

17. If yes, where was it provided?
   1) At home
      2) Bought on the way to school
      3) Provided at school

18. What meals are provided by the school? Tick the meals provided
   1) Breakfast
   2) Morning break
   3) Lunch
   4) Evening break

19. What do you have for lunch?
   1) Bring food from home
   2) Buy food from the school canteen
   3) Buy food from outside the school
4) Do not have lunch
5) Others, specify ........................................

To be continued by every pupil

20. How many meals do you have in day?
   1) One    2) Two    3) Three    4) Others, specify ..................

21. Have you been sick in the last 2 weeks?
   1) Yes    2) No    3) Do not know

22. Do you have any chronic illness?
   1) Yes    2) No    3) Do not know

23. What type of house do you live in?
   1) Grass thatched mud house
   2) Mud house with iron sheets
   3) Permanent house (bricks)
   4) Others, specify ........................................

24. What type of toilet facilities do you use at home?
   1) Flush toilet
   2) Traditional pit latrine (mud & grass)
   3) Ventilated improved pit latrine (bricks, iron sheets/tiles & pipe)
   4) Bush/field
   5) Others, specify ........................................

To be filled by the Interviewer

25. What is the location of school visited?
   1) Urban    2) Rural

26. Ownership of school visited?
   1) Government    2) Private

27. Where does the pupil live?

....................................................... (Probe for information such that you are able to determine if it is a rural or urban area)
A 24 hour recall of the dietary patterns of the pupil (for yesterday)

<table>
<thead>
<tr>
<th>Meals</th>
<th>Food item (solid food &amp; fluids)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakfast</td>
<td></td>
</tr>
<tr>
<td>Morning break</td>
<td></td>
</tr>
<tr>
<td>Lunch</td>
<td></td>
</tr>
<tr>
<td>Evening break</td>
<td></td>
</tr>
<tr>
<td>Supper</td>
<td></td>
</tr>
<tr>
<td>Snacks/Others</td>
<td></td>
</tr>
</tbody>
</table>

**Note: To the Interviewer**

- Probe the pupil for more information on food items eaten for the various meals throughout the day basing on the food groups as shown below.

The foods given below in the various food groups are just examples. In case the child gives you other foods not given below, write down.

Food groups include:

- Staple foods: Cereals:- maize, millet, wheat, rice.
  Starchy foods:- Matooke, cassava, potatoes, yams. etc
- Energy rich foods: butter, oil, margarine, ghee and sugar etc.
- Protein rich foods: Vegetable origin:- beans, peas, g.nuts etc.
  Animal origin:- meat, fish, eggs, milk and milk products and insects etc.
- Food containing vitamins and minerals: fresh fruits and vegetables etc.
Appendix III

Key Informant Interview Guide
(To be administered to the District Education Officer, Head teachers of the schools, District Director of Health Services)

Good morning/ Afternoon, Madam/ Sir,

We are from the office of District Director of Health Services, Jinja District and Makerere University Institute of Public Health, Kampala. We are conducting a study on the effect of school feeding programmes on the nutritional status of pupils in primary day schools in Jinja district.

The purpose of this study is to assist the District Health Team of Jinja District and other stakeholders to plan appropriate interventions that will advocate, promote, support and improve nutrition in primary schools.

We are kindly requesting you to participate in the study. You are free to pull out during the course of the study.

This information will be strictly confidential and will be used only for purposes of this study.

Thank you very much.

Date..........................................................
Signature of Respondent......................................
Signature of Interviewer......................................

Key informant No............................
Name of the Interviewer..............................
Date..............................

Position held by the Key informant....................
Name of the organisation..............................
County ..................................................
1. In your own words, what is a school feeding programme?

2. Do you have any school feeding programmes running at the moment? If yes, why or if no, why?

3. What importance do you attach to a school feeding programme in primary day schools? (What are the benefits of a school feeding programme?) Looking for alleviation of hunger, improves attention, performance and general health, increases enrolment and attendance and reduces dropout rates of pupils.

4. What role do you play in school feeding programmes? What are the roles of other stakeholders in school feeding programmes; government, parents and pupils?

5. How should primary school children be fed during school days? Probe for number of meals a day, what foods and reasons why you recommend these foods.

6. In your opinion, what is the situation of school feeding programmes in Jinja District?

7. In your opinion, what do you think can be done to improve the school feeding programmes and the feeding of the school children?
Appendix IV Focus Group Discussion Guide
(To be administered to the parents in the community)

Informed Consent
You are all welcome to the focus group discussion. We are from the office of District Director of Health Services, Jinja District and Makerere University Institute of Public Health, Kampala. We are conducting a study on the effect of school feeding programmes on the nutritional status of pupils in primary day schools in Jinja district.

The purpose of this study is to assist the District Health Team of Jinja District and other stakeholders to plan appropriate interventions that will advocate, promote, support and improve nutrition in primary schools.

We are kindly requesting you to participate in the study. You are free to discuss with us and among yourselves. You are also free to pull out during the course of the study.

This information will be strictly confidential and will be used only for purposes of this study.

We will be taking notes and we request for your permission to let us tape record your comments so that we can be sure that everyone's opinion is correctly noted.

Thank you very much.

Signature (or thumbprint) of Respondents
1) ........................................ 5) ........................................
2) ........................................ 6) ........................................
3) ........................................ 7) ........................................
4) ........................................ 8) ........................................

Signature of the Facilitator.......................... Date......................

Signature of the Note taker..........................
County ........................................
Sub county ....................................
Number of participants.........................
Characteristics of participants

The few rules for this discussion:

- Give your views openly and frankly. No one will be quoted.
- Speak only when it is your time and be audible.
- Respect each other's opinion.
- There are no right or wrong answers. I am looking for different points of view.

1. Why is feeding school children important?

2. How should school children be fed? Frequency of feeding? What are the foods? Why do you recommend these particular foods?

3. What are problems the school children may have if they are not properly fed? What are your recommendations?

4. What are your feelings about provision of meals to children at school?
   Do you approve of a school feeding programme? If yes, explore further on the benefits of school feeding programme. If no, why? What are the effects of lack of a feeding programme?

5. Do you think you should participate in the school feeding programme? If yes or no, why? Do you think your participation would improve in the school feeding programme? How?

6. What do you think can be done to improve on the school feeding programmes?
## Table 1: Pupils’ Socio-demographic Factors by SFP and their Associations

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<th>Variables</th>
<th>School Feeding Programme</th>
<th>OR, 95% CI</th>
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<td>Male</td>
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<tr>
<td>Age in years</td>
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<td>99</td>
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<td>12-13</td>
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<td>P.6 – P.7</td>
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<td>Birth order</td>
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<td>First to third</td>
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<tr>
<td>Fourth to fifteenth</td>
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<td>Survivorship of both parents</td>
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<tr>
<td>&gt; 1 Km</td>
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<td>---------</td>
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<tr>
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