MAKERERE  UNIVERSITY

INVESTIGATING THE IMPACTS OF IMPROPER FEEDING ON ACADEMIC PERFORMANCE OF BIOLOGY IN SECONDARY SCHOOLS IN WAKISO DISTRICT, UGANDA

BY

OKWANGOLE EMMANUEL, ORYEM DIANA DIDI, OKENG DICKENS

A RESEARCH REPORT SUBMITTED TO THE COLLEGE OF EDUCATION AND EXTERNAL STUDIES IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF BACHELOR OF SCIENCE WITH EDUCATION (BIOLOGICAL) OF MAKERERE UNIVERSITY KAMPALA

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DECLARATION

We Diana Didi Oryem, Dickens Okeng and Emmanuel Okwangole declare that the proposal "is our own work and that all sources we have used or quoted have been indicated and acknowledged, by means of complete references and it has never been submitted for any award to any University or Institution of higher learning.

DISSERTATION BY

S/N	NAME	REGISTRATION NUMBER	SIGNATURE
1	OKENG DICKENS	22/U/22635	
2	OKWANGOLE EMMANUEL	22/U/6806	
3	ORYEM DIANA DIDI	22/U/6829	

APPROVAL

I hereby approve the submission of the report entitled "Impacts of improper feeding on academic performance of Biology among secondary school students in Wakiso district, Uganda". The proposal has been read and approved as meeting the preliminary research requirements of the Department of Science, Technical and Vocational Education (DSTVE) in the partial fulfillment of the award, a bachelor of science with education (Biological) at Makerere University , Kampala ,Uganda

SUPERVISOR

Dr. EDWARD KANSIIME (Phd)

Signature: .....

Date: 13/10/2025

DEDICATION

We dedicate this dissertation to all learners, stakeholders in charge of students' welfare and academics. We also extend this dedication to our beloved families, who have been our greatest source of love, encouragement, and support throughout our university journey.

We also dedicate this work to our lecturers and mentors for their guidance, patience, and commitment to academic excellence, which motivated us to complete this study successfully.

May this contribute meaningfully to the promotion of good nutrition in the different institutions of learning in Uganda and beyond.

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ABSTRACT

This study examined the relationship between student feeding habits and academic performance in Biology, as well as possible interventions to improve nutrition among secondary school students. This study was guided by the following research objectives; to investigate the relationship between students' feeding habits and their academic performance in Biology. To examine the effects of improper feeding on students' performance in biology. To suggest possible interventions for improving students' nutrition to enhance their academic performance in Biology. This study employed a mixed-methods research design, incorporating both qualitative and quantitative approaches. A survey was conducted among secondary school students to gather data on their feeding habits and academic performance. Additionally, interviews were conducted with teachers and school nutritionists to gain further insights. A total of 200 respondents participated in the survey. Results indicated that 65% of respondents believed their feeding habits influenced their Biology performance, while 20% reported noticing an improvement in understanding the subject when they ate well. However, a majority (55%) stated they did not experience noticeable changes, highlighting mixed perceptions of the feeding–performance link. When asked about strategies to improve feeding, the most preferred intervention was establishing school gardens (40%), followed by introducing balanced diet menus (25%), regular nutrition education (20%), and increasing funding for school meals (15%). These preferences suggest that respondents value sustainable, school-based solutions over purely financial interventions. The findings imply that sustainable food production, nutrition education, and diversified diets are key to improving student health and academic outcomes. The study recommends establishing school gardens, developing balanced diet menus, incorporating nutrition education into the curriculum, and enhancing community involvement in school feeding programs. Overall, addressing student nutrition through a combination of practical and educational interventions can contribute significantly to academic performance and wellbeing.

CHAPTER ONE

1.0 Introduction

Proper nutrition plays a vital role in the cognitive development and academic performance of students. In secondary schools across Uganda, many learners experience challenges related to improper feeding, which can negatively impact t heir ability to concentrate, retain information, and perform well academically. Poor dietary habits whether due to inadequate food intake, imbalanced nutrition, or reliance on unhealthy food choices can result in fatigue, poor mental alertness, and increased susceptibility to illnesses, further hindering academic success. This study seeks to explore the relationship between improper feeding and the academic performance of secondary school students in Uganda. It aims to identify key dietary deficiencies affecting learners, examine their effects on concentration and learning outcomes, and propose practical interventions that schools, parents, and policymakers can adopt to enhance student nutrition and academic achievement. Understanding this link will contribute to the development of more effective strategies for ensuring that students receive the necessary dietary support to excel in their studies.

1.1 Background of the Study

Wakiso District, located in the Central Region of Uganda, is one of the most populous and rapidly urbanizing districts in the country (Kisakye, 2020). It is home to a diverse population, including a significant number of students enrolled in various educational institutions (Kisakye, 2020). Despite its proximity to Kampala and its socio-economic growth, Wakiso faces challenges in ensuring the well-being of its residents, particularly students (Nuwagaba, 2025). Getacher (2023), one critical issue is the impact of improper feeding on students' academic performance, which has far-reaching consequences for their future and the development of the district.

Improper feeding refers to inadequate or imbalanced nutrition, which can result from factors such as poverty, lack of awareness, and limited access to nutritious food (Lutter, *et al*, 2011). In Wakiso District, many students come from low-income families that struggle to provide regular and healthy meals. This issue is exacerbated by the rising cost of living and the limited availability of school feeding programs (Bradbur, 2023). Improper feeding can lead to malnutrition, fatigue, and poor cognitive development, all of which negatively affect students' ability to concentrate, retain information, and perform well academically.

The academic performance of students in Wakiso District is influenced by various factors, including the quality of education, availability of resources, and socio-economic conditions. However, nutrition plays a pivotal role in determining students' ability to learn and excel. Studies have shown that students who receive balanced meals are more likely to attend school regularly, participate actively in class, and achieve higher grades (Nuwagaba, 2025).

Conversely, those who suffer from improper feeding often experience absenteeism, low energy levels, and reduced academic achievement (Bradbur, 2023).

In many secondary schools, however, students face challenges related to improper feeding. Some students skip meals, particularly breakfast, due to various factors such as economic constraints, lack of awareness, or negligence. Others consume unbalanced diets, relying heavily on fast foods and processed snacks, which may be high in sugar and fats but lack essential nutrients like proteins, vitamins, and minerals. Bradbur (2023), such poor nutritional habits can lead to reduced cognitive abilities, lack of focus, fatigue, and overall poor academic performance.

Given the crucial role of proper nutrition in learning, this study seeks to assess the impact of improper feeding on the academic performance of secondary school students. By understanding the relationship between nutrition and educational outcomes, this research will contribute to policy recommendations aimed at promoting better feeding practices among students.

1.2 Problem Statement

Many students engage in improper feeding habits, including skipping meals, consuming unhealthy foods, and lacking essential nutrients. The extent to which these feeding habits affect students' academic performance is not well understood, especially in low- and middle-income settings where food insecurity and poor dietary habits are prevalent. While some research has linked nutrition to cognitive performance, there is a need for more localized studies to assess how improper feeding specifically impacts the academic success of secondary school students.

1.3 Objectives of the Study

1.3.1 The main objective of this study

To assess the impact of improper feeding on academic performance in Biology among secondary school students in Wakiso District in Uganda.

1.3.2 The specific objectives

i. To investigate the relationship between students' feeding habits and their academic performance in Biology.
ii. To examine the effects of improper feeding on students' performance in biology.
iii. To suggest possible interventions for improving students' nutrition to enhance their academic performance in Biology.

1.4 Research Questions

i. What are the different nutritional programs in schools in Wakiso?

ii. How does improper feeding impact students' academic performance in Biology?
iii. What strategies can be implemented to promote proper feeding among students?

1.5 Significance of the Study

The study on the impact of improper feeding on students' performance in biology holds immense significance for several reasons:

i. Biology is a subject that requires critical thinking, memorization, and practical skills, all of which are heavily influenced by proper nutrition. Understanding how improper feeding affects students' cognitive abilities and concentration can help educators and policymakers implement interventions to enhance academic performance in biology.
ii. Biology often covers topics related to nutrition, human physiology, and health. By addressing the consequences of improper feeding, the study can raise awareness among students, parents, and teachers about the importance of balanced diets, thereby promoting healthier lifestyles.
iii. The findings of the study can guide the development of policies and programs, such as school feeding initiatives that ensure students have access to nutritious meals. Such initiatives could directly contribute to better academic achievements in biology and other subjects.
iv. The study can identify specific gaps or challenges related to feeding practices in schools within Wakiso District. This knowledge can assist school administrators in creating tailored strategies to address these issues and improve students' academic experiences.

CHAPTER TWO

2.0 Literature Review

2.1 The Role of Nutrition in Academic Performance

Previous studies have established a strong link between nutrition and cognitive development. Proper nutrition is associated with improved memory, attention span, and problem-solving skills. Malnutrition, on the other hand, can lead to decreased motivation, low concentration levels, and poor academic outcomes.

A study by Florence et al. (2008) found that students with poor dietary habits performed significantly lower in standardized tests compared to those who had a balanced diet. Similarly, research by Taras (2005) highlights that skipping breakfast leads to decreased cognitive function, making it harder for students to grasp new concepts in class.

Iron and iodine are critical for cognitive development. Iron deficiencies may render children inattentive and uninterested in learning (Zhu, 2025). Iron supplementation was shown to improve IQ scores of previously iron deficient children (Seshadri & Gopaldas, 1989). Evidence also shows that children who suffer from iodine deficiencies are more likely to perform poorly than those without (Del Rosso, 1999). To counter the harmful effects of micronutrient malnutrition, some school feeding programs provide fortified food. The provision of such food was shown to increase the dietary intake of micronutrients. For example, in Peru, researchers studied the effect of a breakfast program that included iron-fortified rations. The program significantly increased dietary intakes of iron by 46%, besides increasing energy and protein by 25% and 28% respectively (Jacoby et al, 1996). Three rigorous studies conducted in Jamaica by Lawson (2012), that investigated the impact of school feeding programs on cognitive functions and learning outcomes provide evidence of the beneficial impact of FFE on cognitive outcomes. First, a study in 1983 examined 115 children aged 12 years and above who were enrolled in three classes in a poor rural area school. One class was served school breakfast with the other two classes serving as controls. The impact evaluation included: school achievement, attendance, and weight gain. School achievement was measured using tests that included arithmetic, spelling and reading. Children were followed over two semesters. After the first semester, the treatment group showed improved school attendance and arithmetic scores compared to the control classes, but no difference in weight gain. After controlling for school attendance, academic improvement remained significant showing some evidence that reducing hunger during school hours could affect learning of arithmetic (Powell et al, 1983).

The second study examined the effect of breakfast on cognitive functions among 90 children aged above 12 years with different nutritional status. The study examined the effects of omitting breakfast on the cognitive functions of three groups of children: stunted, non-stunted control, and previously severely malnourished. Using a crossover

design, the investigators tested each child on two mornings one week apart (where the first week the child had received breakfast and the second had not). In order to have greater control over the experiment, children's meals on the previous evening were standardized and children subsequently fasted until they received the treatment breakfast or the placebo. Fluency and digit span tests were conducted and results showed that there was a detrimental effect of missing breakfast. Results also indicated that cognitive functions were more vulnerable in poorly nourished children (Simeon, 1989).

The third study investigated the short-term effects of giving breakfast on cognitive performance in primary school children who were mildly undernourished as compared with adequately nourished children. The experiment took place in four primary s in rural Jamaica. Children were randomly assigned to a group provided with breakfast or a quarter of an orange as a placebo. Researchers then administered four cognitive tests (visual search, digit span, verbal fluency and speed-of-information-processing tests). After a few weeks the treatments were reversed and the tests repeated. Undernourished children's performance improved significantly on a test of verbal fluency when they received breakfast. Adequately nourished children did not experience any significant improvement (Chandler et al, 1995).

These and the findings of Simeon and Grantham-McGregor (1989), indicate that targeting of school meals to undernourished children should achieve greater impact in terms of improving children's cognitive ability.

Besides studies based on experimental design, some studies have examined school feeding programs directly to determine the impact on academic performance. In 22 out of30 provinces in Burkina Faso, the success rate on a national exam for sixth grade pupils was higher for schools that had school feeding programs (Moore & Kunze, 1994). Other studies of the determinants of academic achievement in Benin, Burkina Faso and Togo found that a school meal was positively related to children's performance on year-end tests. In Benin, children in schools with canteens scored 5 points higher on second-grade tests than did children in schools without canteens (WFP 2001).

2.2 Common Improper Feeding Practices among Students

Some common improper feeding habits observed among students include: Skipping meals: Many students, especially those from low-income backgrounds, skip meals due to financial constraints or lack of time (WFP 2001). Dymytrenko (2009), consumption of junky food; that is fast prepared food and processed snacks, which are low in essential nutrients, has become a staple for many students. Unbalanced diets: Some students consume meals that lack essential proteins, vitamins, and minerals, leading to deficiencies that affect cognitive function (Benton, 2010).

2.3 Effects of Improper Feeding on Students

Improper feeding affects students in various ways, including: Reduced concentration levels and difficulty focusing in class (Ljusberg, 2011). Increased fatigue and sluggishness, leading to reduced participation in learning activities. Higher absenteeism rates due to nutrition-related illnesses such as anemia and weakened immune systems (Ljusberg, 2011). Poor nutrition impairs concentration, memory retention, and cognitive processing, leading to lower academic achievement (Chandler et al, 1995). Lack of adequate calories and essential nutrients causes physical weakness, reduced stamina, and lethargy, limiting participation in both academic and co-curricular activities. Deficiencies in vitamins and minerals increase susceptibility to illnesses, resulting in frequent absenteeism. In children and adolescents, inadequate nutrition can stunt physical growth and delay mental development. Hunger and poor diets may contribute to irritability, poor social interactions, and disruptive classroom behavior (Chandler et al, 1995). Persistent poor feeding can lead to chronic conditions such as anemia, obesity, diabetes, and cardiovascular diseases later in life.

In educational settings, ensuring proper feeding is therefore crucial for fostering not only academic success but also overall health and wellbeing.

CHAPTER THREE
METHODOLOGY

3.1 Research Design

This study employed a mixed-methods research design, incorporating both qualitative and quantitative approaches. A survey was conducted among secondary school students to gather data on their feeding habits and academic performance. Additionally, interviews were conducted with teachers and school nutritionists to gain further insights.

3.2. Sample Size Determination

A sample is a small representation of the study population from which data is collected and used to make generalisations about the whole population.

The sample is to be determined using Taro Yamane Formula as shown below;

$$n=N/ (1+Ne^{2}).$$

Where n=sample population

N=total population

e=allowed error of 5%

N=1 school.

3.3 Target Population

The study focused on secondary school students in selected schools. The target population includes students from different academic levels (Form 1 to Form 6), school administrators or teachers who monitor students' performance and school nutritionists responsible for meal planning (if available).

3.4 Sampling Technique

To ensure that the study accurately represents the target population, appropriate sampling techniques was employed.

3.4.1 Simple random sampling

Chosen to ensure diversity in responses. A simple random sampling method was used to select students from different academic levels. A sample size of 200 students from 5 schools was used.

3.5 Data Collection Methods

To effectively study the effects of improper feeding on the academic performance of secondary school learners in Uganda, a combination of qualitative and quantitative data collection methods was employed. The following research tools were used:

3.5.1. Questionnaires

Structured questionnaires were distributed to students to collect information on their dietary habits and academic performance.

3.5.2. Academic Records Review

Students' performance records were analyzed to establish trends related to their nutritional habits.

3.5.3. Interviews

Teachers and school nutritionists were interviewed to provide expert opinions on how nutrition affects students' learning.

3.6 Data Analysis

Quantitative data from questionnaires was analyzed using statistical tools such as SPSS to identify correlations between feeding habits and academic performance. Qualitative data from interviews was analyzed thematically to highlight key patterns and insights.

3.7 Ethical Considerations

Research was carried out in acceptable way; an introductory letter from the university was obtained to allow us collect data from the selected schools is to be presented to the head teacher to ask for permission from the school authorities before conducting the survey. Participants were told that their participation is voluntary, and students were assured of their confidentiality and the ethical research standards was followed, ensuring no harm comes to participants.

CHAPTER FOUR

DATA PRESENTATIONS, INTERPRETATIONS AND DISCUSSIONS

4.1 Socio-Demographic Statistics

Most participants 106(53%) were males while the rest 94(47%) were females. Majority of participants 106(53%) were between age bracket of 15-17, followed by 42(21%) who were above 20 years old, then 40(20%) who were between age bracket of 18-20 and lastly those of 12(6%) only were between age bracket of 12-14 years old. The population was dominated by senior one 60(30%), followed by senior two 46(23%), followed by senior three 40(20%), then senior five 30(15%), second last was senior four 20(10%) and lastly senior six who were 4(2%) only. Majority of the participants 100(50%) lived with their parents, followed by 60(30%) who were living in hostels and lastly those who were living alone and guardians/ relatives were 20(10%).

A total of 200 respondents participated in the study. Out of these, 106 (53%) were male, while 94 (47%) were female.

Regarding age distribution, 12 respondents (6%) were between 12–14 years, 106 (53%) were aged 15–17 years, 40 (20%) were 18–20 years, and 42 (21%) were above 20 years.

In terms of class level, 60 respondents (30%) were in Senior One, 46 (23%) in Senior Two, 40 (20%) in Senior Three, 20 (10%) in Senior Four, 30 (15%) in Senior Five, and only 4 (2%) in Senior Six.

Concerning living arrangements, half of the respondents (100, 50%) lived with their parents. Sixty respondents (30%) lived in hostels, 20 (10%) lived alone, and another 20 (10%) lived with guardians or relatives.

4.2 Feeding Habits

Once a day (70%) is the most common eating pattern, followed by twice a day (15%) and thrice a day (10%). Only 5% of respondents reported eating more than three times a day. This indicates that the majority of students have low meal frequency, which can negatively affect energy levels and academic performance. 55% rarely eat breakfast, and 5% never eat breakfast at all. Only 30% always eat breakfast before school, while 10% sometimes do. Skipping breakfast is prevalent, which may contribute to poor concentration, reduced memory retention, and lower classroom engagement. The most common breakfast is tea only (40%). According to Hasz (2012), a nutritionally balanced breakfast is crucial for improved memory, problem-solving skills, and overall academic achievement. The results reveal that breakfast skipping and poor breakfast quality are prevalent among the students. This trend may be a contributing factor to low concentration levels, poor retention of information, and

disengagement in the classroom. The findings highlight the need for nutrition education, school feeding programs, or interventions to promote regular and balanced breakfast consumption to support students' academic success. 15% take porridge, while 10% have no breakfast at all. Most breakfasts are low in nutritional value (mainly carbohydrates with little protein), limiting their ability to sustain energy for learning. 47.5% never consume fast food/snacks, while 25% consume them daily, and 17.5% consume them 2–3 times per week. Nearly half of the students avoid junk food, which is positive, but a quarter consume it daily, raising concerns about poor diet quality. According to Dalgaard et al (2024), protein-rich breakfasts are associated with improved satiety and better cognitive performance, while carbohydrate-heavy meals without balance can lead to energy dips and reduced concentration. This suggests that even when students eat breakfast, the quality of their meals is insufficient to meet the nutritional needs necessary for effective learning. Regular consumption of junk food is associated with poor nutrient intake, weight gain, fatigue, and decreased academic performance (Lytle et al., 2002).

Perceived adequacy of diet for academic focus; 60% believe their current diet does not provide enough energy to focus in class. 30% believe it does, and 10% are unsure. The majority feel their diets are inadequate for optimal learning performance. Decision-making on daily meals; 72.5% decide their own meals, 17.5% rely on parents/guardians, and 10% depend on school provisions. The high rate of self-decided meals suggests a lack of parental involvement in meal planning, which may explain the poor diet quality and meal frequency.

The findings reveal serious nutritional and dietary challenges among respondents. A large proportion of students eat only once a day, skip breakfast, and consume nutritionally weak meals such as tea only/ tea with bread. The low protein and micronutrient intake could contribute to fatigue, poor concentration, and reduced academic performance. Breakfast skipping, reported by over 60% is particularly concerning because numerous studies show that students who eat breakfast regularly perform better academically. Inadequate and imbalanced diets, as perceived by 60% of respondents, can impair cognitive function, memory, and problem-solving skills. The fact that most students decide their own meals indicates limited parental or institutional guidance, which can lead to poor dietary choices. Additionally, daily consumption of fast food/snacks among a quarter of respondents suggests a risk of unhealthy weight gain and nutrient deficiencies. In conclusion, the results demonstrate that students face a double challenge: poor-quality breakfasts and high reliance on junk food for some, both of which may undermine their concentration, energy levels, and long-term health. According to Black et al (2017), unless interventions are put in place, these dietary habits may contribute to poor learning outcomes and increased health risks.

Out of the 200 respondents, the majority (140, 70%) reported eating only once a day. Thirty respondents (15%) ate twice a day, 20 (10%) ate three times a day, while only 10 (5%) ate more than three times daily.

When asked whether they regularly eat breakfast before school, 60 respondents (30%) said they always did, 20 (10%) sometimes did, 110 (55%) rarely ate breakfast, and 10 (5%) never took breakfast.

In terms of the type of breakfast usually consumed, 80 respondents (40%) reported taking tea only, 70 (35%) took tea with bread, 30 (15%) had porridge, while 20 (10%) did not take any breakfast at all

With regard to fast food or snack consumption, 50 respondents (25%) ate them daily, 35 (17.5%) consumed them 2–3 times a week, 20 (10%) did so occasionally, and the largest group, 95 respondents (47.5%), reported never consuming fast food or snacks.

When asked whether their current diet gives them enough energy to focus in class, 60 respondents (30%) answered "Yes," 120 (60%) said "No," and 20 (10%) were not sure.

On who usually decides what they eat daily, the majority (145, 72.5%) said they decided for themselves, 35 respondents (17.5%) indicated that their parents or guardians made the decision, while 20 (10%) said food was decided by the school.

4.3 Knowledge and attitudes on nutrition

70% of respondents have received some education on proper nutrition. 30% have never received such education. While a majority have some awareness, a significant minority still lack formal knowledge about healthy eating, which may influence poor dietary habits. The lack of formal knowledge among this group may partly explain the persistence of poor dietary habits, such as inadequate breakfasts and frequent junk food consumption, as highlighted in the earlier results. According to Ragavi (2024), nutrition education plays a critical role in shaping healthy eating behaviors, particularly among adolescents, and the absence of such education can contribute to uninformed and unhealthy dietary choices.

62.5% of the respondents believe that nutrition affects their ability to learn and concentrate in Biology. 37.5% do not think so. Most students recognize the link between diet and academic performance, but over one-third remain unconvinced, suggesting the need for stronger nutrition awareness programs. The majority's recognition of the link between nutrition and cognition aligns with research by Florence, Asbridge, and Veugelers (2008), who found that students with healthier diets performed better academically. However, the fact that more than one-third remains unconvinced suggests a gap in understanding the practical importance of nutrition, highlighting the need for stronger and more targeted nutrition awareness programs within schools. 30% always feel hungry, 32.5% sometimes feel hungry, 20% rarely feel hungry, and 17.5% never feel hungry during class. Hunger is a frequent issue, with over 62% always experiencing it during lessons, which can disrupt learning. This means that over 62% of students regularly experience hunger while in class, which has serious implications for learning. Hunger is known to impair concentration, reduce memory retention, and increase fatigue, thereby lowering classroom

engagement and academic outcomes. These findings are consistent with Hannum, E., & Hu, L. C. (2017), who demonstrated that hunger and undernutrition significantly limit students' ability to learn and participate effectively in school.

42.5% feel sleepy when hungry, 22.5% lose concentration, and 15% become irritable. 20% say hunger has no effect on them. Sleepiness is the most reported effect, followed by poor concentration, both of which directly impact learning outcomes. Irritability, though less common, can also affect classroom behavior and relationships. The results indicate that while most students have received nutrition education, a considerable number (30%) have not, which may contribute to misconceptions about diet and learning. Encouragingly, a majority understand that nutrition affects academic performance, aligning with research that links adequate nutrition to improved cognitive abilities and school achievement. However, hunger during class remains a widespread problem reported by nearly two-thirds of the respondents. Frequent hunger disrupts concentration, reduces participation, and in many cases, induces fatigue and irritability, which can affect both individual performance and overall classroom atmosphere. The high proportion of students feeling sleepy or losing focus when hungry highlights the need for consistent and balanced meals before and during school hours. The fact that 20% report "nothing changes" may reflect either individual resilience or a lack of awareness about subtle cognitive effects of hunger. In summary, while many students have received nutrition education and some recognize the role of diet in learning, a sizeable minority lack knowledge or remain unconvinced. Moreover, hunger is a persistent challenge that disrupts learning for most students. Strengthen school nutrition programs to provide breakfast or mid-morning meals. Expand nutrition education campaigns to reach all students, emphasizing the diet–learning link. Encourage parental involvement in ensuring students eat adequately before school and monitor hunger levels and explore interventions such as school gardens or food banks for a better student performance in subjects under STEM.

4.4.1 Academic performance

Out of the 200 respondents, 140 (70%) reported that they had received some education or information on proper nutrition, while 60 (30%) had not.

When asked whether nutrition affects their ability to learn and concentrate in Biology, 125 respondents (62.5%) agreed that it does, whereas 75 (37.5%) said it does not.

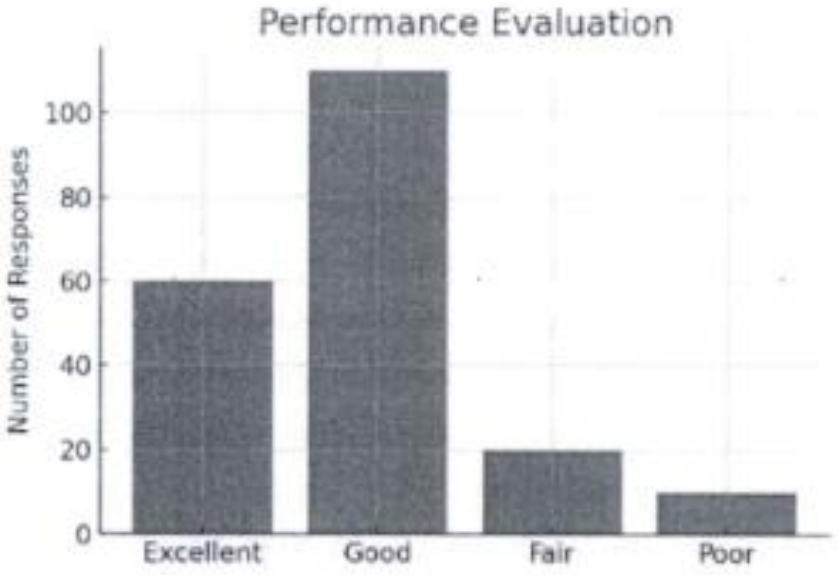
On whether they feel hungry during class time, 60 respondents (30%) reported always feeling hungry, 65 (32.5%) sometimes, 40 (20%) rarely, and 35 (17.5%) never.

When hunger struck during class, 85 respondents (42.5%) said they felt sleepy, 45 (22.5%) reported losing concentration, 30 (15%) became irritable, while 40 (20%) stated that nothing changed for them.

Good academic performance received the highest number of responses 110(55%). Excellent academic performance follows with 60(30%) responses. Fair in academic performance is much lower, at about 20(10%) responses. Poor is the least frequent rating of academic performance, with about 10(5%) responses. Together, these account for the vast majority of responses, suggesting that most students are achieving at a satisfactory to high level. The presence of a large proportion in the “Good” category demonstrates that while learners are generally doing well, there is still potential to elevate more students into the “Excellent” category.

The results indicate that the majority of respondents rated performance positively, with a large portion (over half) considering it “Good” and a substantial group marking it as “Excellent.” This suggests a generally satisfactory to high level of performance among the evaluated group. However, the smaller proportions rating performance show that there are still areas for improvement. The low "Poor" rating is encouraging, as it means few respondents felt performance was significantly inadequate. Overall, the pattern suggests a strong performance trend with room to push more ratings from “Good” to “Excellent” through targeted improvements, possibly in specific weaker areas that caused some respondents to choose “Fair” or “Poor.

These findings are consistent with previous studies that highlight the role of balanced nutrition, adequate preparation, and supportive learning environments in sustaining high levels of academic achievement (Florence & Veugelers, 2008). Given that results this study revealed issues of skipping breakfast, poor diet quality, and hunger in class, it is possible that these factors are influencing why some students fall in the “Fair” or “Poor” performance categories. Overall, the results suggest a generally strong academic performance trend, with more than half achieving “Good” and a substantial portion reaching “Excellent.” The challenge moving forward is to strengthen interventions such as improved nutrition, enhanced teaching support, and targeted academic assistance to help shift more learners from “Good” to “Excellent” and reduce the already small percentage in the “Fair” and “Poor” categories.



Primary source (2025).

Figure 1: Rating of academic performance.

Figure 1:1: Rating of academic performance

4.4.2 Feeding habits and academic performance

65% of respondents believe their feeding habits influence their Biology performance. 15% think there is no influence, while 20% are unsure. The majority acknowledge a link between nutrition and academic achievement, although a notable proportion remain unconvinced. Only 20% report noticing an improvement in their understanding of Biology when they eat well. 55% say they do not notice any improvement. 25% are unsure. Despite most students believing that diet affects performance, more than half do not perceive a direct improvement in comprehension after eating well. This statement presents an interesting contradiction between belief and experience. While most students acknowledge that diet affects academic performance, more than half do not perceive a direct improvement in comprehension after eating well. This suggests a gap between general awareness of the importance of nutrition and the actual perception or experience of its effects on cognitive function. Students' belief that diet affects performance may stem from general knowledge perhaps gained through education, media, or health campaigns that nutrition supports concentration, memory, and energy levels.

However, not perceiving a direct improvement after eating well indicates that this belief may be theoretical rather than experiential. They may understand the concept but not feel or notice the immediate benefits. While students intellectually accept that diet affects performance, they may lack immediate experiential evidence of its effect on comprehension. This highlights the importance of promoting both nutritional awareness and self-monitoring to make the connection between healthy eating and learning outcomes more tangible (Pedrera, 2025). The findings present an interesting contrast. While two-thirds of respondents recognize that feeding habits can influence academic performance, particularly in Biology, only one-fifth report experiencing noticeable academic benefits when eating well (Nguyen et al, 2025). This gap may be explained by several factors: Lack of immediate awareness the benefits of good nutrition may be gradual and not always noticeable after a single meal. Poor diet quality even when students "eat well" in their perception, the meals may still lack essential nutrients for cognitive enhancement. And other learning barriers factors like teaching methods, study habits, or home environment may overshadow dietary effects.

The high percentage (55%) who does not notice improvement could also indicate low nutrition literacy, meaning students may not understand how diet influences energy, concentration, and memory.

There's a need for nutrition education programs that clearly explain how balanced diets support brain function and learning (Nguyen et al, 2025). Schools could integrate nutritious feeding programs so students can experience tangible academic benefits. Research could explore whether students' "eating well" actually meets nutritional standards.

Out of the 200 respondents, 130 (65%) believed that their feeding habits influence their performance in Biology, 30 (15%) did not think so, while 40 (20%) were not sure.

When asked whether eating well improved their understanding of Biology, only 40 respondents (20%) said "Yes," the majority (110, 55%) said "No," and 50 (25%) were not sure.

CHAPTER FIVE

DISCUSSION OF RESULTS

This study investigated the impacts of improper feeding on the academic performance of Biology in secondary schools in Wakiso District, Uganda. Specifically, it aims to establish the relationship between students' feeding habits and their academic achievement, identify the common feeding challenges affecting learners, and propose possible interventions to improve both nutrition and learning outcomes. Wakiso District, one of the most populous and educationally vibrant regions in Uganda, hosts a wide range of secondary schools with varying socioeconomic backgrounds. Despite its proximity to the capital city, many students in Wakiso still face feeding challenges due to economic constraints, lack of school feeding programs, or limited nutritional awareness. These factors raise concerns about how improper feeding might be contributing to differences in academic outcomes, especially in performance-intensive subjects such as Biology.

The first objective of the study is: that the study explored the relationship between students' feeding habits and their academic performance in Biology. The results on feeding habits of respondents revealed significant insights into the nutritional behaviors and dietary patterns among secondary school students in Wakiso District. These findings suggest that a majority of learners have irregular and inadequate feeding practices, which may negatively affect their academic performance, particularly in demanding subjects such as Biology. A large proportion of respondents, 140(70%), reported eating only once a day, while 30(15%) ate twice and only 20(10%) ate three times a day. A small fraction, 10(5%), indicated eating more than thrice daily. This shows that the majority of students do not meet the recommended daily meal frequency, suggesting possible cases of undernutrition or food insecurity. Skipping meals or eating only once a day can lead to low energy levels, poor concentration, and decreased cognitive function all of which hinder effective learning and academic performance (Shah et al, 2025). Additionally, breakfast consumption patterns further illustrate poor feeding habits. More than half of the respondents, 110(55%), rarely eat breakfast before school, and 10(5%) never eat breakfast at all. Only 60(30%) always take breakfast, while 20(10%) sometimes do. This finding is concerning, as breakfast is widely recognized as the most important meal for maintaining alertness and concentration during morning lessons. Proper feeding plays a fundamental role in the physical, mental, and intellectual development of students (Mukembo, 2020 & Shah *et al*, 2025). Nutrition directly influences brain function, energy levels, concentration, and overall health, all of which are critical determinants of academic performance. The absence of regular breakfast may contribute to fatigue, slow comprehension, and low participation in class activities, especially in science-based subjects that require mental engagement like Biology.

Furthermore, regarding the type of breakfast consumed, 80(40%) students reported taking tea only, while 70(35%) had tea with bread. One student shared, "We have snakes always for breakfast, but they are always not enough for every students". When that happens, I just sit and wait." Another remarked, "I take tea and bread only, but we don't have them here. I wish we could try them." These voices underscore the emotional and experiential dimensions of inclusion, revealing how the absence of breakfast snacks into exclusion, frustration and diminished self-worth. A smaller number, 30(15%), took porridge, and 20(10%) had no breakfast at all. These results indicate that even when students eat breakfast, it is often nutritionally inadequate, lacking in essential macronutrients such as proteins and vitamins (Emilien, 2017). A carbohydrate-dominated breakfast (tea and bread) provides minimal sustained energy, which may not support prolonged academic activity, practical sessions, or examinations.

In terms of fast food or snack consumption, nearly half of the respondents, 95(47.5%), reported never consuming fast food, while 50(25%) did so daily, and 35(17.5%) consumed it 2–3 times a week. Only 20(10%) did so occasionally. This pattern suggests that while a segment of students frequently consumes fast foods, which are often high in fats and low in nutrients, a majority do not. However, those who depend on fast foods may face risks of unbalanced diets and reduced nutrient intake necessary for cognitive performance (Emilien, 2017).

When asked whether their current diet gives them enough energy to focus in class, most respondents, 120(60%), reported "No," indicating that their diets are insufficient to sustain concentration throughout the school day. Only 60(30%) believed their diet was adequate, while 20(10%) were unsure. This perception highlights the reality of nutritional inadequacy and its possible link to fatigue, low motivation, and poor classroom engagement (Hall, 2016 & Mogre, 2018). Finally, 145(72.5%) respondents indicated that they decide what they eat daily, while 35(17.5%) depend on parents or guardians, and 20(10%) on the school. This shows that most students have limited guidance on nutritional choices, possibly leading to poor dietary decisions due to lack of awareness or financial constraints (Mogre, 2018). When students make independent food choices without nutritional knowledge, they may opt for cheaper, less nutritious meals, contributing to improper feeding. However, many schools and households continue to experience challenges in providing balanced diets, leading to cases of undernutrition, irregular meals, and poor feeding habits among learners.

In the context of secondary education, Biology is one of the core science subjects that requires high levels of concentration, analytical thinking, and practical engagement (Mukembo, 2020). The complexity of the subject makes it more sensitive to factors that affect mental alertness and comprehension, such as improper feeding. Students who do not receive adequate nutrition may struggle with fatigue, low attention span, and reduced memory retention, which in turn hinder their academic progress and achievement in science subjects like Biology.

About knowledge and attitude on nutrition; the results highlight the relationship between nutritional awareness, feeding conditions, and students' learning experiences in Biology. The findings indicate that while most students have some knowledge about nutrition, many still experience hunger and its negative effects during class, which directly undermines their concentration and academic engagement. The quantitative data show that a majority of respondents, 140(70%), reported having received some form of education or information on proper nutrition, while 60(30%) had not. This suggests that most students are at least aware of the importance of good nutrition (Salam & Esmail, 2018). However, the persistence of poor feeding habits seen in earlier results implies that awareness does not always translate into practice. The gap between knowledge and behavior may be due to economic constraints, lack of school feeding programs, or limited parental involvement in promoting healthy eating habits. Therefore, while nutrition education exists, its effectiveness in shaping students' feeding practices remains limited (Salam & Esmail, 2018, Mukembo, 2020).

About the impact of nutrition on learning and concentration; a majority of the respondents, 125(62.5%), agreed that nutrition affects their ability to learn and concentrate in Biology, while 75(37.5%) did not. This finding reflects a general understanding among students that diet influences academic performance. Since Biology requires focus, comprehension, and practical participation, the students' recognition of the role of nutrition suggests they are aware that inadequate feeding can impair these abilities. This aligns with educational research emphasizing that balanced nutrition enhances cognitive functions such as memory, attention, and problem-solving.

The second objective of the study, it examined the effects of improper feeding on students' performance in biology

About the experience of hunger during class time; the results showed that 60(30%) of students always feel hungry during class, 65(32.5%) sometimes feel hungry, 40(20%) rarely feel hungry, and only 35(17.5%) never experience hunger during lessons. These statistics indicate that over 60% of students experience hunger at least sometimes while in class. This situation can severely affect participation and comprehension, particularly in subjects like Biology that demand sustained attention and practical involvement (Spies, 2014). Frequent hunger may stem from irregular meal patterns, poor-quality meals, or the absence of school feeding programs.

Finally about the effect of hunger on students concentration in class; when students were asked how hunger affects them, 85(42.5%) said they feel sleepy, 45(22.5%) lose concentration, 30(15%) become irritable, while 40(20%) reported no noticeable change "One student said that he always sleep in class whenever he misses breakfast/lunch". This reveals that hunger has tangible negative effects on students' classroom behavior and cognitive performance (Payne-Sturges, 2018). Sleepiness and loss of concentration are direct indicators of

reduced mental alertness caused by insufficient energy intake (Boukhris *et al*, 2019). Irritability further reflects the emotional consequences of hunger, which may disrupt classroom discipline and participation. Although a small portion (20%) reported no effect, the majority experience significant impairments, indicating that hunger is a critical barrier to effective learning in subject like Biology.

The evaluation of academic performance, categorized into four levels: Excellent, Good, Fair, and poor based on the number of responses recorded. The results show that the majority of respondents rated their academic performance as good, with about 110 responses, indicating that most students perceive their performance as satisfactory and above average. This suggests a generally positive academic trend among learners, where many are achieving desirable results, possibly due to consistent study habits, teacher support, or moderate learning environments (Payne-Sturges, 2018).

The next highest category is Excellent, with around 60 responses. This reflects a significant proportion of students who perform exceptionally well, demonstrating strong academic abilities, discipline, and likely adequate learning resources or better feeding habits that support concentration and productivity. Together, the "Good" and "Excellent" categories represent a large majority, implying that over 80% of the students have achieved commendable performance levels.

In contrast, only a smaller fraction of respondents rated their performance as Fair (about 20 responses) or Poor (around 10 responses). These lower ratings indicate that a minority of students are struggling academically, potentially due to challenges such as poor nutrition, limited study support, or unfavorable learning conditions (Boukhris *et al*, 2019, Payne-Sturges, 2018). One student said "Have not been performing well since first term because the diet and feeding only beans and maize flour".

Overall, the performance distribution demonstrates that while most students in the study area are performing well in their academics, a noticeable minority still face challenges that hinder optimal performance. These findings align with the broader context of the study, suggesting that factors such as improper feeding may contribute to the observed differences in performance, particularly for those in the lower-performing categories (Abraham, 2024). Proper nutrition, therefore, remains a vital factor in sustaining and improving the academic achievement of students, especially in subjects like Biology that require continuous focus and cognitive energy.

Additionally; the findings on the relationship between feeding habits and academic performance in Biology revealed that students generally recognize the influence of nutrition on their learning outcomes, though many do not experience clear improvements due to poor or inconsistent feeding practices. The quantitative data showed

that a majority of respondents, 130(65%), believe that their feeding habits influence their performance in Biology. This demonstrates a strong awareness among students of the link between nutrition and academic success (Abraham, 2024). Proper feeding is essential for maintaining concentration, energy, and memory retention, all of which are critical for understanding and performing well in a science subject like Biology that demands both theoretical and practical engagement. However, 30(15%) of the respondents stated that their feeding habits do not affect their performance, while 40(20%) were not sure. Rynes (2005), this variation may indicate that although many students conceptually understand the importance of good nutrition, some may not have directly observed its effects due to habitual poor feeding, lack of nutritional knowledge, or other intervening factors such as teaching quality or study habits. It also suggests that awareness alone may not always lead to behavior change or measurable improvement in academic outcomes.

When they were asked whether they notice an improvement in their understanding of Biology after eating well, only 40(20%) responded "Yes," while the majority, 110(55%), said "No," and 50(25%) were "Not Sure." This result indicates that most students do not perceive a direct, noticeable improvement in their comprehension of Biology as a result of proper feeding. This could be due to several reasons: many students may not regularly experience consistent, balanced meals; others may underestimate the subtle cognitive benefits of good nutrition; or their performance could be influenced more strongly by other factors such as instructional methods or study time (Abraham, 2024, & Rynes, 2005). Nevertheless, the 20% who reported improved understanding when well-fed "highlights that good nutrition can positively affect alertness and cognitive efficiency". This group's experience supports scientific evidence that adequate intake of nutrients enhances brain function and learning capacity.

Thirdly; this study identify the possible interventions for improving students' nutrition to enhance their academic performance in Biology. The findings on suggestions and interventions provide valuable insights into students' perspectives on how feeding habits and nutrition can be improved to enhance academic performance, particularly in Biology. The results reveal a strong awareness among respondents of the importance of sustainable and practical approaches to improve students' diets and learning outcomes. The majority of respondents, 80 (40%), suggested setting up school gardens to improve students' diets. This was the most frequently mentioned intervention, indicating that learners recognize the value of self-sustained food production within schools (Hlalele, 2013). School gardens can provide fresh vegetables and fruits, supplementing school meals and improving nutritional diversity. Additionally, they can serve as educational tools, particularly in subjects like Biology, by

linking classroom learning with real-life agricultural and ecological practices. This finding aligns with previous research emphasizing the role of school gardens in promoting food security and nutrition education among students (Jeronen, 2016 & Abraham, 2024). The second most common suggestion was introducing balanced diet menus, supported by 50 (25%) respondents. This recommendation highlights students' awareness of the need for varied and nutritious meals rather than monotonous or carbohydrate-heavy diets. Implementing balanced menus can help ensure that students receive adequate proteins, vitamins, and minerals necessary for growth and cognitive performance.

Additionally, regular nutrition education was suggested by 40(20%) respondents. This reflects the belief that proper knowledge about healthy eating can lead to better feeding choices among students. Continuous nutrition sensitization programs can help bridge the gap between awareness and behavior, enabling students to understand the direct link between nutrition and academic success. A smaller but notable group, 30(15%) respondents, recommended increasing funding for school meals. This acknowledges the financial challenges schools face in providing adequate food and underscores the need for institutional and governmental support. Increased funding could ensure the consistent provision of quality meals, particularly in public schools where most learners may come from low-income families. A very large majority, 175(87.5%), expressed support for the introduction of school-provided meals, while only 25(12.5%) opposed the idea. This overwhelming support demonstrates that most students recognize the potential benefits of having structured feeding programs within schools (Jeronen, 2016). School-provided meals can help reduce hunger during class time, improve concentration, and promote equal learning opportunities by ensuring that all students have access to at least one nutritious meal a day. The small proportion of students opposed may reflect personal preferences, dietary restrictions, or concerns about cost.

When asked what advice they would give to fellow students regarding feeding and academic success, the majority, 113(56.5%), advised avoiding excessive junk food. This suggests an understanding among learners that unhealthy food choices, often high in sugar and fats, can reduce energy levels and negatively impact concentration (Francis, 2011). Another 35(17.5%) encouraged eating balanced meals, reinforcing the importance of nutritional variety for better health and performance. Additionally, 30(15%) recommended that students understand the link between nutrition and grades, showing awareness of the cognitive and academic benefits of good feeding habits. A smaller portion, 22(11%), advised planning meal times, emphasizing the importance of consistency and discipline in maintaining a healthy diet.

In conclusion, the findings indicate that students in Wakiso District are not only aware of the feeding challenges they face but also capable of proposing meaningful and practical solutions. The most preferred intervention setting up school gardens demonstrates a preference for sustainable, school-based initiatives that combine nutrition improvement with experiential learning. The high level of support for school-provided meals underscores the need for institutional policies that prioritize student nutrition as a key component of educational quality. Collectively, the responses highlight that improving student feeding requires a multi-faceted approach: integrating nutrition education, providing balanced meals, supporting school garden projects, and ensuring adequate funding. Addressing these areas can significantly enhance students' health, concentration, and overall academic performance, especially in demanding subjects such as Biology.

CHAPTER SIX

6.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

Objective one: **The students' feeding habits and their academic performance in Biology**

The study findings show that many students in Wakiso District face serious nutritional challenges that negatively affect their academic performance in Biology. Most students eat only once a day, skip breakfast, or consume nutritionally poor meals such as tea or tea with bread. These habits result in low intake of essential nutrients, leading to fatigue, poor concentration, and reduced cognitive ability. Breakfast skipping was identified as a major concern, as it deprives students of the energy needed for alertness and participation in class. Even when breakfast is taken, it is often unbalanced and insufficient to meet the nutritional needs of growing adolescents. Many students also experience hunger during lessons, which lowers their focus and understanding of complex Biology concepts. Although most learners recognize that feeding habits influence performance, their actual diets remain poor due to economic limitations, lack of school feeding programs, and inadequate nutritional guidance. Overall, improper feeding reduces students' energy, attention, and learning efficiency. The study recommends promoting school feeding programs, nutrition education, and parental support to improve both students' health and academic achievement in Biology.

Objective two: The effects of improper feeding on students' performance in biology

The study findings reveal that the majority of students demonstrated commendable academic performance. Overall, the pattern suggests a strong performance trend, where most learners are achieving at acceptable or superior levels. However, the difference between "Good" and "Excellent" performance categories points to existing opportunities for improvement. Strengthening factors such as proper nutrition, consistent breakfast intake, effective teaching support, and conducive learning environments could help elevate more students into the "Excellent" category. These results align with previous studies, such as Florence and Veugelers (2008), which highlight the importance of balanced nutrition, adequate preparation, and supportive academic environments in enhancing student performance. Therefore, while the overall academic performance is positive, continued efforts should focus on addressing dietary and learning challenges that may hinder a small proportion of students from reaching their full potential.

Objective three: The possible interventions for improving students' nutrition to enhance their academic performance in Biology

The study reveals that improving student feeding requires a multifaceted approach, with respondents showing the strongest preference for sustainable, school-based solutions such as establishing school gardens to supply fresh

produce. Balanced diet menus and regular nutrition education were also recognized as essential in enhancing students' dietary habits and academic performance. While increased funding for school meals was suggested, it was less prioritized, possibly due to perceived financial challenges or the belief that self-reliant methods may be more practical. The study findings reveal that the most preferred intervention for improving student feeding was the establishment of school gardens. This demonstrates a strong inclination toward sustainable and self-reliant strategies that promote food security and nutritional quality within schools. School gardens are perceived as valuable not only for producing fresh, nutritious food but also for serving as an educational resource that teaches learners practical skills in agriculture, nutrition, and environmental stewardship. Additionally, the suggestion to introduce balanced diet menus underscores the importance of dietary diversity and nutritional balance in enhancing students' health and learning outcomes. The proposal highlights the recognition that knowledge and awareness play a key role in shaping lasting healthy eating behaviors. In contrast, increased funding for school meals was the least favored option, likely due to concerns about financial sustainability and dependence on external funding sources. Overall, the results indicate that respondents favor practical, locally driven, and sustainable interventions such as school gardens over purely financial solutions. These approaches not only reduce food costs but also empower schools and students to take active roles in improving nutrition. The findings further suggest the need to explore community willingness to support school feeding initiatives to strengthen long-term program sustainability.

6.2 Recommendations

i. Establish school gardens. Schools should set up and maintain gardens to provide fresh fruits and vegetables for student meals. This will promote self-reliance, reduce food costs, and improve diet quality. Schools should establish and maintain well-managed gardens within their compounds to grow fruits, vegetables, and other nutritious crops that can supplement students' meals. School gardens can provide a reliable source of fresh, organic, and nutrient-rich foods such as leafy vegetables, beans, and fruits. Including these in student meals ensures a more balanced diet, improving students' physical health, concentration, and overall academic performance. By producing their own food, schools can reduce dependence on external food suppliers and lower the overall cost of feeding programs. This promotes self-sufficiency, allowing schools to sustain meal programs even with limited budgets.

ii. Introduce balanced diet menus. School meal programs should be guided by nutritionists to ensure meals contain the right mix of carbohydrates, proteins, vitamins, and minerals. Balanced diet menus ensure that every meal

provides the essential nutrients students need for energy, body growth, and brain function. A proper mix of food groups such as cereals, legumes, animal proteins, fruits, and vegetables helps prevent malnutrition and related health problems. A well-balanced diet directly supports better concentration, memory, and classroom participation. Students who eat nutritious meals are more likely to perform well academically compared to those who are undernourished or skip meals.

iii. Implement regular nutrition education. Integrate nutrition lessons into the curriculum and organize workshops for students, teachers, and parents to promote awareness and healthy eating habits. Nutrition concepts can be incorporated into subjects such as Biology, Home Economics, Agriculture, and Health Education. This helps students understand the relationship between diet, health, and academic performance from an early age. Regular workshops, health talks, and school-based campaigns can be organized to educate students, teachers, and parents about the importance of balanced diets, food hygiene, and meal planning. Such initiatives help bridge the knowledge gap and encourage better food choices at both school and home.

iv. Increase support and funding for school meals. Government agencies, NGOs, and community stakeholders should collaborate to provide financial and material support for sustainable school feeding programs. By increasing awareness, students become more conscious of their eating behaviors, learn to avoid junk foods, and develop lifelong healthy eating patterns. Teachers and parents also gain practical knowledge to support healthy feeding practices in their communities.

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APPENDIX 1: TIMELINE

ACTIVITY	MAY	JUNE	JULY	AUGUST
Planning				
Literature review				
Data collection				
Data analysis				
Report writing				
Evaluation and review				

APPENDIX 2: BUDGET

ITEMS	AMOUNT
Personnel	50000/=
Data collection	150000/=
Data analysis	50000/=
Writing and revision	50000/=
TOTAL	**300000/=**

APPENDIX 3: DATA COLLECTION TOOL QUESTIONNAIRE FOR STUDENTS

Confidential: For academic research purposes only

Please tick (✓) where appropriate or fill in the space provided.

Section A: Background Information

1. Sex: ☐ Male ☐ Female
2. Age: ☐ 12–14 ☐ 15–17 ☐ 18–20 ☐ Above 20
3. Class Level: ☐ Senior 1 ☐ Senior 2 ☐ Senior 3 ☐ Senior 4 ☐ Senior 5 ☐ Senior 6
4. Do you live: ☐ With parents ☐ In school hostel ☐ Alone ☐ With guardian/relative

Section B: Feeding Habits

5. How many meals do you usually have in a day? ☐ One ☐ Two ☐ Three ☐ More than three
6. Do you regularly eat breakfast before school? ☐ Always ☐ Sometimes ☐ Rarely ☐ Never
7. What type of breakfast do you usually eat? ☐ Tea only ☐ Tea with bread ☐ Porridge ☐ None ☐ Other (specify): _____
8. How often do you consume fast food or snacks (e.g. chips, soda, chapati, biscuits)? ☐ Daily ☐ 2–3 times a week ☐ Occasionally ☐ Never
9. Do you believe your current diet gives you enough energy to focus in class? ☐ Yes ☐ No ☐ Not sure

10. Who usually decides what you eat daily? ☐ Myself ☐ Parents/Guardians ☐ School ☐

Other: _____

Section C: Knowledge and Attitudes on Nutrition

11. Have you ever received any education or information on proper nutrition? ☐ Yes ☐ No
12. Do you think nutrition affects your ability to learn and concentrate in Biology? ☐ Yes ☐

No ☐ Not sure

13. Do you feel hungry during class time? ☐ Always ☐ Sometimes ☐ Rarely ☐ Never
14. When you are hungry in class, how does it affect you? (You can tick more than one)

☐ Feel sleepy ☐ Lose concentration ☐ Become irritable ☐ Nothing changes

Section D: Academic Performance in Biology

15. How would you rate your performance in Biology? ☐ Excellent ☐ Good ☐ Fair ☐ Poor
16. Do you think your feeding habits influence your performance in Biology? ☐ Yes ☐ No ☐ Not sure
17. When you eat well, do you notice improvement in your understanding of Biology? ☐ Yes

☐ No ☐ Not sure

Section E: Suggestions and Interventions

18. What do you think can be done to improve feeding among students?

_____

19. Would you support school-provided meals if introduced? ☐ Yes ☐ No ☐ Maybe
20. What advice would you give to fellow students about feeding and academic success?

_____

Thank you for your time and honest responses!
Your input will help improve understanding and solutions for better academic performance and student health.