

Feeding Program Utilizing Iodine and Protein Content Dumplings: A Food Innovation

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Abstract: *Malnutrition specially stunting problems of elementary and secondary public schools in the Philippines was the key element why this study had been realized. This study aimed to find out the significant effect of feeding program utilizing iodine and protein content dumplings. Thirty Grade - VIII Food Trade students of subject respondents were from Eusebio Lopez Memorial Integrated School, Sagay City, Negros Occidental, Philippines. The objectives of this study were to produce dumplings soup utilizing iodine and protein content food ; to determine the body mass index and academic performance of the grade eight Food Trade Students in the pre and post feeding program and to determine whether or not significant differences exist among the variables considered. A quasi experimental design is used. The instrument consisting of three parts, the survey on health and nutrition education, the proper preparation of menu before the interventions were provided and gathering of data in the respondent's nutritional status and academic performance. Statistically, there was a significant effect after the interventions were utilized. It means that the improvement of nutrition education and food preparation have significantly affects to the improvement of academic performance. Therefore, production and commercialization of iodine and protein dumplings is necessary.*

Keywords: Feeding program, Academic performance, Food Plate, Nutrition education, Iodine and protein content dumplings

1. Introduction

Malnutrition remains the leading nutritional problem globally most especially in the Philippines. In 2016 Philippine survey, about four million (31.8%) of the preschool population were found to be underweight for age, three million (19.8%) adolescents and five million (13.2%) adults including older persons were found to be underweight and chronically energy deficient (UNICEF). In Sagay City, Negros Occidental, the case of malnutrition in school, School Year 2015-2016 have come up to the following data: underweight is 459, severely underweight is 126, stunted is 1, 408, severely stunted is 337, wasted is 177, and severely wasted is 80 (NNC, Neg. Occ. Province).

Malnutrition hinders school academic performance and feeding program plays a critical role in intellectual development of pupils and students and would lead to improve academic performance according to the study conducted by Abayomi, O. of Ghana on the Educational Outcomes of School Feeding Intervention : Evidence from Rural Northern Ghana and by Dr. Gregorio Reyes of the Polytechnic University of the Philippines, entitles the Impact of School-Based Feeding Program on the Physical Growth, Academic Performance and Social Development of Students in Holy Spirit Elementary School.

Feeding Program has been along issue in public school in the Philippines. In fact, the local government of Sagay City, Negros Occidental, Philippines through their policy, every year allocated a Bottoms Up Budgeting (BUB) for public elementary and high school but still under nutrition is the leading problem in the country. Meaning feeding of vegetables and some energy foods is not enough to solve this issue. How one could imagine observing students having their packed lunch with enough rice, a small amount of dried fish or a small cube of chorizo with

vegetable soup assistance extended by schools from the Gulayansa Paaralan Program (GPP). How is stunting and brain development issue will be addressed without taking of much macronutrient protein and micronutrients iodine and iron which are more present in meat, poultry, fish, shell fish and most especially milk and eggs.

It is on this issue that Northern Negros State College of Science and Technology, through its Home Economics instructor imparts and uses idea on producing menu through the help of the Sagay City local government and Department of Health of Sagay City, help alleviating malnutrition situation arising in the community. The production of different dumplings with ingredients commonly found in the locality of Sagay City are developed. The composition of "food plate" for school feeding breakfast are dumplings composed of brown mussel, tilapia, fresh water shrimps, fresh water clams, river swimming crabs with small amount of pork or poultry, liver, sprouted mungbean, milk and boiled eggs. The dumplings sheets are variations of flour, blended squash pulp, squash flowers, malunggay flowers, swamp cabbage flowers and corn powder. The following are the composition of dumpling soup: 50% dumplings which are the variations of tilapia, brown mussel, scallops, fresh water clams, fresh water shrimps, river swimming crabs, the dumpling sheets is 10% which are the variations of squash flowers, squash pulp, malunggay flowers, and corn, 5% water, 10% boiled eggs, 5 % liver either pork or poultry, squash pulp concoction is 10 %, 8% milk 1 % monosodium glutamate, and 1% salt.

The Food Trade Grade-Eight Students of Eusebio Lopez Memorial Integrated School is the group chosen as respondents. They are the target because the learning competency is quite the same with the preparations of interventions to be used, secondly, on the next feeding program, this group will help feeding their own peers especially the Students At Risks Of Dropping Out

(SARDO). When checking the nutritional status of the respondents, it has found out that there are severely wasted and stunted. This situation is alarming. Light weight and stunting are clearly observed from this group. The researchers have undergone mapping the students' residences, among the thirty, twenty-nine have vegetable gardens in their homes, fifteen have toilets in their houses, thirteen use vacant lots as their toilet grounds, two are sharing relatives' toilets. All respondents are living far from the sea, but near the river, usually they use to eat fresh water clams, freshwater shrimps, river swimming crabs, and tilapia. Milk and eggs are not the usual food in their table because of the meager income their parents have. They are not even using spreads and dairy when eating bread which are also important in their health, of the thirty, 23 are not taking breakfast in the morning, seven have packed lunch and 23 rely their food in the canteen. Of thirty, eleven had budget allowance for lunch, nineteen are depending on the season their parents have. The researchers need to analyze that vegetables are not enough to meet the required dietary allowance for teenagers like them. The researcher needs to produce food which can help with their health requirements. Dumplings soup is the decided plate for feeding them during breakfast and source of the dumplings should be available in the locality.

The purpose of this researcher to produce dumplings soup utilizing iodine and protein content food; specifically it aims to determine the following:

1. What is the body mass index of the Grade Eight Food Trade Students before the program is conducted?
2. What is the academic performance of the Grade Eight Food Trade Students before feeding program is conducted?
3. What is the Body Mass Index of Grade Eight Food Trade Students after feeding program is conducted?
4. What is the academic performance of Grade Eight Food Trade Students after the feeding program is conducted?
5. Is there a significant difference between the Body Mass Index of the Grade Eight Food Trade Students before and after the feeding program?
6. Is there a significant difference between the academic performance of the Grade Eight Food Trade Students before and after the feeding program?

Thus, the researcher arrives to a null hypotheses which states that

Ho1. There is no significant difference between the Body Mass Index of Grade Eight Food Trade Students before and after the feeding program.

Ho2. There is no significant difference between the academic performance of the Grade Eight Food Trade Students before and after the feeding program.

The significance of this study will focus on the following: First, the creation of policy on the standardization of public feeding program which is true to all public elementary, secondary and tertiary, the presence of macronutrient protein, and micronutrients iodine and iron in the production of menu such as meat, liver, boiled eggs,

milk (either fresh or enriched), sprouted mungbean, and mushroom others should be taken from the Gulayansa Paaralan Program. (GPP) Second, the food system policy on safe production, transportation and handling of food and the food system production of the farmers and the groups in cooking preparation. Third, the promotion of a continuing research development to address the recent needs and issue on malnutrition specifically on the education and culture in the home.

2. Methodology

A quasi experimental research design was used in the study. Thirty (30) students in Grade VIII Food Trade class served as the respondents as the survey was administered before and after the intervention changes related to the experiment. The following research instrument as a tool for gathering data were used. It has three (3) parts which are; Part 1 was the survey in awareness on health and nutrition education, before the intervention was provided. There were 30 items to be answered by yes or no to determine the gaps. Part 2 aimed to gather data in the respondent's nutritional status concerning the variable treated in this study which is the Body Mass Index (BMI) of the respondents scaling from severely wasted, wasted, normal, overweight and obese and the mean is calculated. Part 3 aimed to gather data in the respondent's academic performance which was the pre and post test using the 2017 "Healthy Diet, Gawing Habit For Life" module for teenagers of the National Nutrition Council of the Philippines scaling from very low, low, high and very high and the mean was calculated. The total enumeration was used in choosing the respondents because this group would help in the food preparation for the Students' At Risks Of Dropping Out (SARDO) feeding activities.

3. Intervention Used in the Study

Nutrition Education Self Check Guide

"Healthy Diet, Gawing, Habit for Life" Module of NNC (National Nutrition Council)

The menu for one week cycle created by the NONESCOST (Northern Negros State College of Science and technology) was used as feeding guide. The food plate produced were dumplings soup enriched with iodine, and protein dumplings, which were used as breakfast snacks.

Morning breakfast menu was used since basing on the survey most of the respondents were not having breakfast from their home so instead of lunch, the researcher used breakfasts menu. When checking the recommended dietary allowance for teenagers of the NNC (National Nutrition Council), it was suggested that the "Filipino Plate" suggested is 13-15 years for male is 2700 energy in kilo calorie, for female is 2170 energy in kilo calorie. Here is the suggested Filipino plate for morning breakfast: 1 medium bowl of dumplings soup, 1 boiled egg, 1 slice of cake, 1 glass of vitamin c juice and a small glass of fresh milk

4. Data Gathering Procedure

In order to study the effect of Pre and Post Feeding Program in the Body Mass Index and the Academic Performance of Grade-VIII Food Trade students, the researcher conducted the following procedure:

1. The researcher asked permission from the DepEd District 9 supervisor and ELMIS school principal about the research study and proposed an action plan for approval.
2. The researcher visited and discussed to the section advisers and obtained records of their BMI after the first examination, and the pre test. Started conducting the Pre-survey on Knowledge, Attitude and Practices (KAP) in Health and Nutrition Education.
3. The researcher used bilingual (Hiligaynon and Filipino) as a medium of instruction and read slowly the questions and the students responded each question directly.
4. The researcher requested the parents and the respondents to attend an orientation on the feeding activity. The parents and students undergo skills training on how to prepare the menu such as the composition and process of the different variations of dumplings' soup which to be used as feeding snacks.
5. The researcher conducted pre-survey to the respondents after establishing the validity and reliability of the research instrument by the help of three Social Science Teachers and Teachers with specialization in biotechnology, nurse of the Division of Sagay, dietician of St. Anne Hospital in Cadiz City and Sagay City Health doctor. Sufficient copies of questionnaire were reproduced for the survey. The respondents answered the questionnaire during their TVE (Technical-Vocational Education subject) time. The answered questionnaires were retrieved; the data were tallied, tabulated, analyzed and interpreted as to be the basis of the study.
6. The researcher gathered the Body Mass Index (BMI) of the respondents in the 1st quarter period by their respected teacher-adviser.
7. The intervention utilized by the researcher was the Feeding Program utilizing dumplings soup sponsored by the local government of Sagay City, Negros Occidental, Northern, Negros State College of Science and Technology together with the Nutrition Education Council-Sagay City Chapter, and DepEd ELMIS, STVEP Food Trade from 2nd quarter to 3rd quarter period. Then the lecture on the module of NNC 2017, Healthy Diet Gawing Habit For Life.
8. The post survey was administered after the intervention was utilized for a period of time.
9. The researcher gathered the 3rd quarter Body Mass Index (BMI) and conducted post test regarding the "Healthy Diet, Gawing Habit For Life module by the National Nutrition Council of the Philippines to the respondents after the Feeding Program together with the teaching the Nutrition Education as included in the learning competency of STVEP especially in Food Trade.

10. The lecture discussion on the nutrition education was done everyday by allocating ten- minute discussion, then followed by the skills training of the respondents producing a food plate which is the dumpling soup with iodine and protein content.
11. The symposium on malnutrition by the Department of Health-Sagay City and attended by all Grade-VIII students of ELMIS last July 2017 with their parents.
12. The researcher then conducted a one hundred twenty days Feeding Program with Grade-VIII Food Trade students preparing the food starting from July 10, 2017 up January 10, 2018. Orientation and deworming through City Health Department of Sagay City was conducted to Grade-VIII Food Trade students before the feeding activities started. The composition of dumplings' soup was previously stated in the introduction.
13. January 10, 2018 was the end of 120 days feeding program activities. Then, the researcher determined their body mass index and post test from their respective teacher advisers. The researcher made a comparison and obtained the difference on the increase of BMI (Body Mass Index), Post test on Nutrition Education using the "Healthy Diet, Gawing Habit for Life of the National Nutrition Council of the Philippines. Then researcher made a closing program.

5. Statistical Treatment of Data

For problem numbers 1, 2, 3, and 4 the frequency and percentage was used and the mean was calculated. The Body Mass Index was categorized into obese, overweight, normal, wasted and severely wasted. The level of academic performance was categorized into very high, high, low, and very low. A percentage frequency distribution displayed data that specified the percentage of observations which existed for each data point or grouping of data points.

For problems no.5 and 6 a T-test was utilized to test these hypotheses, gathering the mean of the Pre and Post Body Mass Index as well as the mean of the Pre and Post test using the module of the National Nutrition Council. The T-test was tested at 0.05 significant levels.

6. Results of the Study

Table 1:

First Quarter Summary of the Body Mass Index (BMI) Grade - VIII Food Trade Students Eusebio Lopez Memorial Integrated School SY 2017–2018

Body Mass Index	No. of Students	Percentage %
Severely Wasted	7	12.69
Wasted	14	26.67
Normal	9	16.54
Overweight	0	0.00
Obese	0	0.00

Mean = 2.07

Table 1 shows that 7 respondents or 12.69% are severely wasted and 14 or 26.67% are considered wasted and only 9

or 16.54% are considered to have normal body mass index (BMI).

This implies that majority of the respondents are undernourished. This proves to the survey conducted by the NNC (National Nutritional Council), Province of Negros Occidental 2015-2016, that in Sagay City public school, there are 459 underweight, 126 severely underweight, 1,408 are stunted, 337 are severely stunted, 177 are wasted, and 80 are severely wasted. And also proves to the survey report of the UNICEF, that in the Philippines, there are about 4 million or (31.8%) of the preschool population were found to be underweight for age, 3 million or (19.8%) adolescents are underweight and five million or (13.2%) adults including older persons were found to be underweight and chronically energy deficient. Lastly, it proves to the report survey of the United Nations Children Fund that Philippine loses over P220 billion pesos every year because of Under nutrition

Table 2:

First Quarter Level of Academic Performance
Grade - VIII Food Trade Students

Eusebio Lopez Memorial Integrated School SY 2017 – 2018

	Academic Performance	No. Of Students	Percentage %
90.00 – above	Very High	0	0.00 %
86.00 – 89.00	High	4	13.33 %
81.00 – 85.00	Low	10	33.33 %
75.00 – 80.00	Very Low	16	53.33 %

Mean = 3.4

Table 2 shows that 53.33% (16) of the respondents have a very low academic performance between the bracket (75.00 - 80.00), followed by 33.33% (10) for low academic performance with in the bracket of (81.00 - 85.00) and only 13.33% (4) is in the bracket of (86.00 - 89.00) in high academic performance. These indicate that majority of the respondents do not perform well academically in school during the 1st Quarter. This is supported by the study of Chiyuka K of Zimbabwe, Doncillo H. of the Philippines and Oppola et al of Nigeria on the Impact of Poor Nutrition on the Academic Performance in public school children. In addition, this results proves to the publication of the of the “Save the Children” group entitles “Cost of hunger: Philippines”, that childhood stunting - one of the most common forms of malnutrition - has permanent effects on a person’s growth which makes them drop out of school earlier and less productive than other workers when they start working. It also proves the Maslow’s motivational theory that food is the first physiological need of a person to be answered before the other needs. Whereby needs lower down in the hierarchy must be satisfied before individuals can attend to needs higher up..Where food is considered number one physiological need of a person.

Table 3:

Summary of Body Mass Index (BMI)in the Third Quarter after the Treatment

Grade - VIII Food Trade Students

Eusebio Lopez Memorial Integrated School SY 2017 - 2018

Body Mass Index	No. of Students	Percentage %
Severely Wasted	0	0.00
Wasted	4	13.33
Normal	26	86.67
Overweight	0	0.00
Obese	0	0.00

Mean = 2.87

Table 3 shows that after the 120 days feeding program there are 0% or none is severely wasted and only 4 or 13.33% remain to be wasted, and majority of the respondents whom 26 or 86.67% are now in the normal Body Mass Index. This implies that after the 120 days feeding program, the undernourished respondents gain weight and none of them is severely wasted. This supported by the study of Nervaart F. et al of Kenya, Lawson T. of Michigan University and Xavier University-Philippines on the Impact of school feeding program on Nutritional Status of Public School Children. It also proves to the study of Zenebe M et al of Ethiopia that SFP or School Feeding Program increases children’s nutrition and school academic performance.

Table 4:

Third Quarter Level of Academic Performance
Grade - VIII Food Trade Students

Eusebio Lopez Memorial Integrated School SY 2017 - 2018

SY 2017-2018	Academic Performance	No. of Students	Percentage %
90.00 – above	Very High	9	30.00 %
86.00 – 89.00	High	14	46.66 %
81.00 – 85.00	Low	5	16.67 %
75.00 – 80.00	Very Low	2	6.67 %

Mean = 2.1

Table 4 shows that after 120 days feeding program, 9 respondents or 30% are having a very high academic performance, and 14 or 46.66% respondents have high academic performance. This implies that after the feeding program the respondents’ academic performance increases. This is supported by the study of Abayumi and Reyes stated in the literature above that students with proper nutrition perform well in school and also proves the Maslow’s motivational theory that physiological needs such as food should be given priority before the other needs.He states that people are motivated to achieve certain needs and that some needs take precedence over others. Our most basic need is for physical survival, and this will be the first thing that motivates behavior. Once that level is fulfilled the next level up is what motivates, and so on. He adds that if these needs are not satisfied, the human body cannot function optimally. Maslow considered physiological needs the most important as all

the other needs become secondary until these needs are met. So, it proves also to the created principle that malnutrition hinders academic performance and feeding program plays a critical role in public school.

Table 5:

Significant Difference between the Body Mass Index of the Grade Eight Food Trade Students before and After the Feeding Program

Body Mass Index	N	Mean	SD	Sig. (2-tailed)
1 ST Quarter	30	2.07	0.739	0.000
3 rd Quarter	30	2.87	0.346	

Table 5 shows that there is a significant difference in the Body Mass Index of Grade-VIII Food Trade Students of ELMIS SY 2017 - 2018 in the Pre and Post Feeding Program. The results reveal that the t-value was 0.000, which is less than 0.05 ($t=0.000 < 0.05$). This implies that statistically there is a significant effect after the intervention was utilized. The null hypothesis 1 is therefore rejected. This result proves to the study of Kidane of Ethiopia that feeding program is impacted nutritional status of students in public school and thus students are more interested to enroll because they know they are being cared for. It also proves that feeding program when conducted and monitored seriously the nutritional increase can prove to the "No Children Left Behind" principle.

Table 6:

Significant Difference between the Academic Performance of the Grade Eight Food Trade Students before and after the Feeding Program

Test	N	Mean	SD	Sig. (2-tailed)
Pre – Test	30	10.23	1.89	0.000
Post – Test	30	24.83	2.01	

Table 6 shows that there is a significant difference in the Academic Performance of Grade-VIII Food Trade Students of ELMIS SY 2017 - 2018 in the Pre and Post Feeding Program.

The result reveals that the t-value was 0.000, which is less than 0.05 ($t=0.000 < 0.05$). This implies that statistically, there is a significant effect after the intervention was utilized. It also means that an improvement of nutrition has significantly affects to an improvement of academic performance. The null hypothesis 2 is therefore rejected. This result proves that Abraham Maslow Hierarchy of Needs is true. He says to distinguish physiological needs from other needs, it is important to note that they are commonly isolable and localizable somatically. The most common physiological needs are breathe, hunger, thirst and others. He adds that when physiological needs are addressed, the other stages of needs follows, therefore feeding program utilizing proper substances plays an important role to the nutritional status of students in public school and thereby improving the academic performance.

7. Summary of Findings

The findings show that the majority of the respondents' Body Mass Index before the feeding program are within the severely wasted and wasted and their academic performance is between very low and low. It also shows that after 120 days of intervention with feeding program utilizing dumpling soup, the respondents have significantly improve their Body Mass Index and even their academic performance which means that there is a significant difference in their Body Mass Index as well as academic performance before and after the conduct of interventions.

8. Conclusion

The study concludes that Feeding Program utilizing dumplings soup affects the Body Mass Index and the Academic Performance of respondents. Therefore, this research recommends the authorities concerned to:

1. Commercialize and standardize the food plate of dumplings' soup.
2. Come up with ideas on how to expand the Feeding Program with nutrition education, the promotion of safe production and innovation of high quality substances food which will contribute to health development of the students to become active in school academic performance;
3. That the government will encourage research and development on the closely and seriously monitoring on the survey of SBFP (School –Based Feeding Program) of the Department of Education on the strict implementation of feeding the right kinds of food ;
4. Conduct nutrition education to the group preparing the food;
5. Allocate one - hour time feeding activities to every class adviser as a regular subject included in the eight-hour civil service allocated time for government employees;
6. Include in Values Education subject competency the safe production, handling and preparation of food for the students' awareness of the right kinds of food to eat for physical and moral self improvement thereby preparing the students to future active participation in nation building;
7. That the government shall create a policy in the utilization of local and indigenous produce of land, rivers and sea in the public schools feeding program, thereby innovating such product in the suited taste of children;
8. Create a policy on food system in the safe production, delivery and preparation of food products;
9. Rehabilitate local land, rivers, and sea as sanctuary of the source of the indigenous local food such as the fresh water shrimps, fresh water clams, river swimming crabs and others;
10. That the local government will educate the parents on the proper production, handling, and preparations of food in their homes;
11. Create a policy on the strict implementation of the consumption of root crops in every home especially the members of 4P's;

If all of these stated above will be implemented seriously, the issue on under nutrition and stunting in public school and community stated on the loses of Philippine government on malnutrition according to the report entitles "Cost of Hunger: Philippines, " which has the lose on educational costs of P1.23 billion due to grade-level repetition by hungry primary and secondary students, P166.5 billion in potential income loss due to lower educational achievement of the undernourished, and another P160 billion in potential income loss due to premature child mortality which is resulted to 328 billion equivalent to 2.84 percent of the 2013 Philippine Gross Domestic Product will gradually be solved.

In the Department of Education, she was the coordinator of Technical -Vocational Education Department. She started Feeding activities since 1994 and serving teenagers assisting their health education awareness specially on hand washing. Set- up GREENHOUSE as Gulayansa Paaralan Program to augment hunger. Promotes "Three Acts of Goodness activity in Eusebio Lopez Integrated School. Promoter of echo-friendly school advocacy. She believes that a child- friendly school should always prioritize the health and safety of students, making the school a promoter of change.

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Author Profile



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Miss Anabelle E. Villaceran had joined College of Education last February 2018 after serving Department of Education for 24 Years. She had created and patented almost twenty food Utility Models and proposed numbers of researches on nutritive value of different foods. Home Economics instructor and dreamed that in the near future can bring her researches to extension services.