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สังกัดกรุงเทพมหานคร และกระทรวงศึกษาธิการ



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**A COMPARISON STUDY OF THE SCHOOL LUNCH PROGRAM IN THE
PUBLIC PRIMARY SCHOOLS BELONG TO BANGKOK METROPOLITAN
ADMINISTRATION (BMA) AND THAI MINISTRY OF EDUCATION (MOE)**

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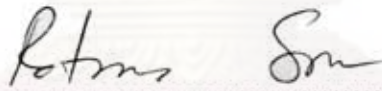
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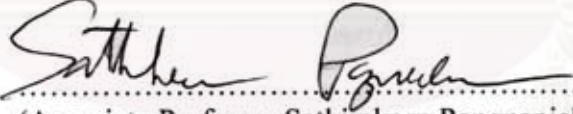
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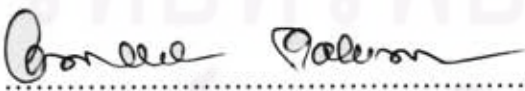
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โครงการอาหารกลางวันในโรงเรียนนับได้ว่าเป็นโครงการที่ส่งผลดีต่อสุขภาพ และเป็นการส่งเสริมการเข้าถึง
 การศึกษาในกลุ่มผู้ด้อยโอกาสทางสังคมและมีฐานะยากจน โครงการอาหารกลางวันในโรงเรียนของประเทศไทย ได้
 ดำเนินการมากกว่า 30 ปี ซึ่งโครงการฯมีส่วนช่วยลดปัญหาการขาดสารอาหาร หรือเด็กน้ำหนักต่ำกว่าเกณฑ์ทั่วประเทศ
 หากแต่พบว่ายังไม่มีกรอบการดำเนินงานอย่างเป็นระบบจากผู้เชี่ยวชาญ อย่างไรก็ตามปัจจุบันนี้ได้เริ่มมีการ
 ประเมินโครงการดังกล่าวแล้ว การศึกษานี้มีวัตถุประสงค์เพื่อทำความเข้าใจถึงการดำเนินงานของโครงการอาหารกลางวันใน
 โรงเรียนประถมศึกษา ของ กรุงเทพมหานคร และกระทรวงศึกษาธิการ โดยเลือกศึกษา 6 โรงเรียน เพื่อทำการเปรียบเทียบ
 โดยเลือกโรงเรียนที่อยู่ภายใต้ระบบการบริหารงานของกรุงเทพมหานคร 3 โรงเรียน และของกระทรวงศึกษา 3 โรงเรียน
 เก็บข้อมูลโดยการศึกษารายละเอียด อันได้แก่ การสังเกต และการสัมภาษณ์ ข้อมูลที่ได้นำมาจัดกลุ่ม และจัดแบ่งเป็นระบบ
 ตามปัจจัยนำเข้า กระบวนการดำเนินงาน และผลลัพธ์ เพื่อเปรียบเทียบระหว่างโรงเรียนทั้งสองระบบ ทั้งนี้ข้อมูล สถิติ และ
 รายงานต่างๆ ได้นำมาวิเคราะห์ในเรื่องคุณภาพของการดำเนินงานโครงการฯ ผลการศึกษาพบว่า ระบบและการบริหาร
 จัดการโครงการอาหารกลางวันของโรงเรียนของกรุงเทพมหานคร และของกระทรวงศึกษาธิการ มีความแตกต่างกัน
 โดยเฉพาะอย่างยิ่งเรื่องระบบการแจกจ่ายอาหาร ซึ่งโรงเรียนของกระทรวงศึกษาธิการมีระบบที่ยืดหยุ่นกว่า ในขณะที่
 โรงเรียนของกรุงเทพมหานครมีระบบที่ชัดเจนเป็นมาตรฐาน พบว่าโรงเรียนทั้งสองระบบ ยังมีปัญหาในเรื่องการเตรียม
 อาหารกลางวันที่มีสารอาหารและพลังงานที่เพียงพอ จำนวนผักและผลไม้ที่แจกในโครงการฯ มีจำนวนน้อยกว่าที่
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 อย่างเป็นรูปธรรม ปัญหาที่พบส่วนใหญ่ของโครงการฯ ก็คือ นักเรียนชอบรับประทานอาหารแบบตะวันตก อาหารจานด่วน
 ขาดการสนับสนุนจากผู้ปกครอง และการเพิ่มขึ้นของราคาอาหาร

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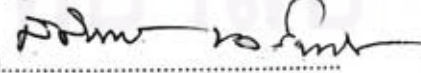
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ลายมือชื่อนิสิต.....

ลายมือชื่ออาจารย์ที่ปรึกษาวิทยานิพนธ์หลัก.....

ลายมือชื่ออาจารย์ที่ปรึกษาวิทยานิพนธ์ร่วม.....





//แสงโสม สีนะวัฒน์

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ERI KAI: A COMPARISON STUDY OF THE SCHOOL LUNCH PROGRAM IN THE PUBLIC PRIMARY SCHOOLS BELONG TO BANGKOK METROPOLITAN ADMINISTRATION (BMA) AND THAI MINISTRY OF EDUCATION (MOE).
THESIS PRINCIPAL ADVISOR: ASSOC. PROF. SATHIRAKORN PONGPANICH, M.A., Ph.D., 62 pp.

The School Lunch Program (SLP) has been considered as an important contributor to children's health outcomes as well as to improve education access and completion particularly for those who are from low socio economic family. In Thailand, the program was initiated more than 30 years ago and it helped to reduce the number of children who were malnourish or underweight in nation wide. However, actual condition or system of the program is not regularly reviewed by expertise and evaluation study has begun only at recent year.

This study was conducted to better understand the current school lunch practices among the public primary schools under the auspices of Bangkok Metropolitan Administration (BMA) and Ministry of Education (MOE). A total of 6 schools, 3 from BMA and 3 from MOE, were selected to compare the lunch schemes. Data was collected using qualitative method including direct observation and interviews. Information was categorized and the program contexts (input, process, and output) were compared between two types of schools. The secondary data was also used to analyze the quality of school lunch.

The results show that the current SLP management and system are quite different between schools under BMA and MOE. Especially, the provision system of the school lunch is less regulated at MOE schools while all BMA schools are providing meals in consistent manner. Preparing a school lunch containing adequate energy and nutrients seem to be still challenging for most of the schools under BMA and MOE. The amount of vegetable and fruit served in the lunch were remarkably less than recommended portions at both schools. This suggests the need of creating a support system to help schools provide healthy well-balanced meal in practical way. The common difficulties that many schools encountering nowadays were students' preferring to eat Western type fast food, lack of parental support, and an increase in food price.

Field of study: Research for Health Development

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Student's signature.....

Advisor's signature.....

Co-advisor's signature.....

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LIST OF ABBREVIATIONS

BMA	Bangkok Metropolitan Administration
CDC	Center for Disease Control
CHO	Carbohydrate
FAO	Food and Agricultural Organization
FBDG	Food-Based Dietary Guidelines
FDA	Food and Drug Administration
MOE	Ministry of Education
MOPH	Ministry of Public Health
NSLP	National School Lunch Program
ONPEC	Office of National Primary Education Commission
RDA	Recommended Daily Allowance
SLP	School Lunch Program
UNESCO	United Nations Educational, Scientific, and Cultural Organization
UNICEF	United Nations Children's Fund
USDA	United States Department of Agriculture
WFP	World Food Program
WHO	World Health Organization

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CHAPTER I

INTRODUCTION

1.1 Background and Rationale

Nutritional status is often considered as an essential factor to determine one's quality of life. A person who is well nourished tends to be much healthier than someone who is not. It is an issue that can affect everyone. Especially, early childhood nutrition plays an important role in children's physical growth and intellectual development so their adequate energy and nutrients intake needs to be encouraged and supported. (Pollitt, 1984) In this regard, schools are often selected as the center to provide education about good nutrition and to enhance projects to improve the health and nutritional status of children. (UNESCO, 2004) One remarkable school-base program is the "school feeding" which usually not only provides children food to fulfill their stomach, but it also gives multi-aspect of benefit to all. (Glasauer, Aldinger, Sen-Hai, Shi-Chang, & Shu-Ming, 2003; Mitchell, 2003) When children are fed at school, they tend to stay and learn better. (Mitchell, 2003) The healthy school meals help children nourish adequately as well as improve their performance and concentration abilities. (Behrman, 1996; Del Rosso & Marek, 1996)

The concept of providing meals at schools was originally developed to reduce the hunger and malnutrition especially during the post-war period, but the program had adopted in many places around the world in these days.

In Thailand, reducing malnutrition rate and micronutrient deficiencies were among the priorities in public health agenda in the past. The National Primary

Education Authority, now known as Ministry of Education (*MOE*), first initiated the School Lunch Program (*SLP*) in 1952 as a pilot project to combat with these problems among young children. Then in 1987, the Office of the National Primary Education Commission (*ONPEC*) started to implement the program in nationwide. Later in 1992, the Fund for School Lunch of Primary School Student Act B.E 2535 was finally proclaimed and the certain amount of budget has been allocated since then. (K Tontisirin, Attig, & Winichagoon, 1995) As a result, *SLP* surely contributed to improve Thai children's health and nutritional status. Indeed, the number of underweight students in primary schools also decreased from 17.8% in 1989 to 10.5% in 1994. (EFA, 1999)

Currently, each primary school receives 10 baht for every school day per enrolled student from the government's revolving fund for the lunch schemes. The amount of money the schools can receive simply depends on the number of students in each institution. Initially, allocated budget was very limited so free lunch used to be provided primarily to those who needed the most, meaning students who were poorer or who were from low socioeconomic families. (EFA, 1999; Sumonnork, 2007) Many schools could not manage to cover the entire students in the school. However, most public schools are managing their own to provide free lunch for every student in a way that they can. Unlike private or border patrol schools where additional monetary source for *SLP* is secured, general public schools usually need to seek an extra support to help the program financially. Consequently, financial conditions are dissimilar among schools and this can affect the quality of lunch provided by schools. (Banchonhattakit, Nathapinthu, Sota, & Polbunta, 2000)

Although Thailand has achieved a great success in reducing malnutrition among school-age children, other nutrition related illnesses such as obesity, diabetes

mellitus, and cardiovascular are strongly concerned today. More children than previous period are becoming obese and overweight while there are still some children whose access to food and nutrients are limited. Especially in Bangkok, urbanization with the rapid economic and social changes altered people's eating habits significantly. (Kosulwat, 2002; Kraisid Tontisirin & Bhattacharjee, 2001) The schools can thus be an important place to provide children healthy food and guide them with nutrition education to reduce the risk for today's burden of illnesses. Public primary schools belonging to the government are where most Thai children attend and spend a large portion of their time. Therefore, the school lunch prepared by public schools is a very important source to ensure nation's child health.

A significance of the *SLP* may be underestimated sometimes. However, school-based food and nutrition activities should be reconsidered by multi sectors in order to improve the current practices and to maintain its quality. Importantly, the *SLP* system and management should be carefully studied to identify any needs for make it better in future.

In Bangkok, public schools are either belonging to the local (*BMA*) or the central (*MOE*) government. Up this date, *SLP* in the *BMA* schools were studied several times but the researches under *MOE* schools were extremely rare until the recent study carried out by *MOPH*. Ideally, the school lunch provided by both type of schools should be no different from each other in terms of its overall quality. It is critical to evaluate the current *SLP* situations at both schools in constant basis, and more information should be made available to schools as well as general public to gain attention to the valuable program like *SLP*.

1.2 Research Questions

1. Is school lunch provided by public primary schools in Bangkok the same in terms of its quality and context?
2. Do the program system and management differ between the schools under *BMA* and *MOE*? If so, how do they differ from each other?
3. What are the barriers to providing quality lunch at both types of schools?

1.3 Objectives

1.3.1 General Objectives

The purpose of this study is to help improve the current *SLP* by describing and comparing the present practices in the general public primary schools which belong to *BMA* and *MOE*.

1.3.2 Specific objectives

- To compare the overall management and system of the *SLP* and between both type of schools.
- To evaluate the quality of the lunch provided by schools, in terms of nutritional values.
- To identify the problems regarding the provision of healthy school meals.

1.4 Significance of the Study

This study will seek to determine if:

- The school lunch provided by schools meets the nutritional requirement
- The schools operate the program according to the guidelines or policy
- The research findings can be used to improve the current practice

1.5 Operational Definition

- **School Lunch Program (SLP)** –is the meal provided by schools. Ideally, schools suppose to offer nutritious and well-balanced lunch which contains at least 1/3 of dairy recommended amount of energy and nutrients on average over time. (USDA, 2007)

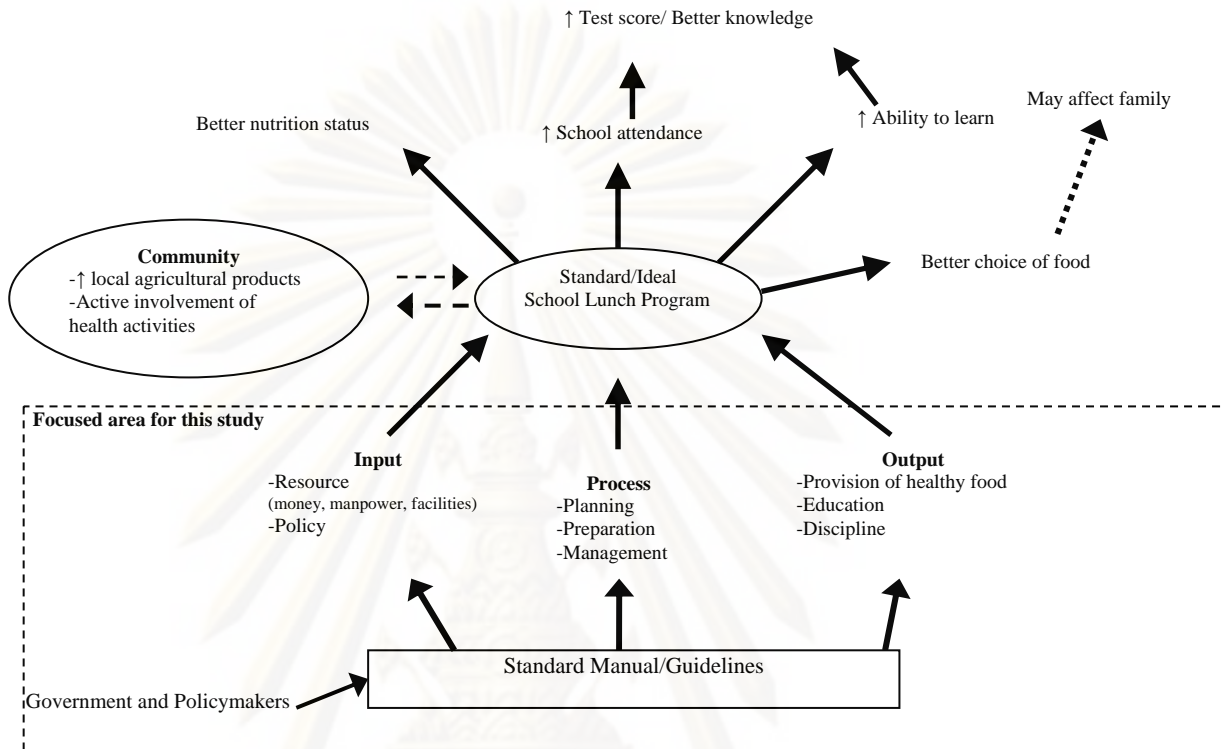
- **School Milk Program** –the government provides free whole milk (200ml/day) for preschool and primary school students on school open-days (200 days) and close-days (30 days).
- **Competitive Food** –as food offered at schools, other than meals served through *SLP* or other program including School Milk Program. (USDA, 2007)
- **Malnutrition** – “People are malnourished if their diet does not provide adequate calories and protein for growth and maintenance or they are unable to fully utilize the food they eat due to illness. They are also malnourished if they consume too many calories”. (FAO, International, & WHO, 1998)
- **Nutrition Intervention** –is designed to promote health and reduce the risk of disease. It is policy, services, learning activities and other related actions implemented by schools or other groups to incorporate healthy nutrition in daily life. (FAO, International, & WHO, 1998)
- **Recommended Dietary Allowance (RDA)** -the average daily dietary intake level that is sufficient to meet the nutrient requirement of nearly all (97 to 98 percent) healthy individuals in a particular life stage and gender group. (USDA, 2007)
- **School Lunch Program Contexts** –in this project, this means the operation system of school lunch program and the contents of the program.
- **Quality of SLP** –the term “quality” refers to nutritional components of lunch as well as its appearance and variation of food.
- **Quantity of SLP** –the term “quantity” refers to the number of lunch provided in the school and its amount of food provided in each meal.

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1.6 Conceptual Framework

Conceptual framework
Ideal SLP as a whole



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CHAPTER II

LITERATURE REVIEW

2.1 School as a setting

According to the World Health Organization (*WHO*) and the Food and Agricultural Organization (FAO, International, & WHO), schools are an ideal place to start implementing nutrition programs and providing health services because they can offer equal opportunities to every child in the most effective and efficient way. Moreover, it is strongly believed that education, health and nutrition are interrelated to each other and cannot be considered in isolation. (FAO, International, & WHO, 1998)

The idea of school-based health program was innovative from long ago. The school food service was initially started in Europe during late 18th century to help hungry and poor children. (Gunderson, 1971) This practice was widely replicated and many acknowledged that school feeding scheme could be beneficial to improve the nutritional status of the population, which could also lead a country's development in future. Until this date, school feeding and nutrition programs have been implemented and promoted in many places around the world. An expansion of the program is also encouraged by several United Nation agencies such as *WHO*, the United Nations Educational, Scientific, and Cultural Organization (*UNESCO*) the World Food Program (*WFP*), the United Nations Children's Fund (*UNICEF*).

Other school nutrition interventions such as treatment for worms, micronutrient supplementation, and nutrition education in schools are proved significantly cost effective in decreasing the risks of many diseases especially in developing countries. (Bundy et al., 2006) Because the school-based programs can be

delivered by schoolteachers and can use preexisting mechanism, costs are at margins. (Del Rosso & Marek, 1996) The school system also makes easier to reach children and their family, which will also allow a greater outreach to community than health clinic.

2.2 The Principles of School Lunch Program

The *SLP* is considered as a positive force in helping children learn and stay in school. (Mitchell, 2003) Therefore, this lunch schemes are being carried out at schools around the world based on established framework and policy in each area.

2.2.1 School Lunch Program in the United States

In the U.S, the National School Lunch Program (*NSLP*) has been well implemented since its initiation in 1946. Ninety-nine percent of the American public schools are participating and more than 30 million students have received the lunch through *NSLP* in 2006. (Grainger, Senauer, & Ford Runge, 2007; USDA, 2007) The underlying goal of *NSLP* was stated as below (Martin, 1996):

- Meals served will meet tested nutritional requirements
- Meals will be available to all children without discrimination regarding their economic or physical condition
- Programs will be operated in an accountable manner
- Funds will be provided to support the program's infrastructure

2.2.2 School Lunch Program in Japan

Japanese *SLP* has also achieved great attentions for many years due to its quality and success. In Japan, School Lunch Law has been activated since 1954 and its basic framework of the law states are as follows (JICA, 2005):

Article 1: “*School lunches are to aid the healthy development of the mind and body of children and students, and contribute to improving the dietary habits of the general population.*”

Article 2: “*the SLP is to realize the objectives of education during the years of compulsory education.*”

Most Japanese children eat school lunch during their school-age and they learn many skills through it: from how to hold the chopstick properly to how to clean their own table. Every student take turn to serve the lunch for others so they also learn principles of sharing, cooperating, and caring of others through the program. Therefore, *SLP* is considered and acknowledged as a part of important educational program in Japan.

2.2.3 School Lunch Program in Thailand

Likewise, *SLP* is a government assisted program and most of primary schools in Thailand are now required to institute daily school lunch services. In addition to providing students lunch everyday, *SLP* is also incorporated with other interventions such as micronutrient supplementation, school snack or milk programs. As a result, the country has achieved a significant success in reducing the number of malnourish children especially in remote area. (Kachondham, Winichagoon, & Tontisirin, 1992) Further, the number of school children who receive free lunch has been increased year by year since the government allocates an endowment fund as well. According to *MOPH*, the amount increased from 11 million baht, which helped 287 schools in year 2000, to 60 million baht that helped more than 3000 schools in year 2005.

(MOE, 2006)

2.3 Significance of the SLP

For long time, school feeding accompany with education program is particularly emphasized for disadvantaged children in many parts of the world. As *WFP* stated, as

many as 400 million of school-age children were still suffering from hunger in 2005. (WFP, 2006) In this regard, many children can be benefited if schools can provide food for them. School meals sometimes can be seen as incentive, which can draw more children to the schools. In India, it was reported such school meal program helped improve educational attainment by better enrollment and retention rate in both rural and urban area. (Viswanathan, 2006) A global school feeding program campaign was thus initiated because food-assisted education could result in higher school enrollment and attendance that would also lead to improve children's learning abilities. (Mitchell, 2003)

School lunch schemes also contributed to reduce malnourish children in many places. Indeed, providing healthy meals to school-age children is substantial approach to improve their health, strength their physiques, and their acquisition of proper dietary habits. A healthy diet during childhood helps to lay the foundation for a healthy adulthood because good nutrition can contribute to reduce the risk of today's leading health problems. Choosing healthy food is not easy especially for young children but school meals can affect children's food choice and diet behavior. It was claimed that healthy intake of food and nutrients is essential but the knowledge and skills are required to make wise choice in food children eat. (McManis & Sorensen, 2000) When Grainger et al. studied if students' food choices are affected by healthy eating promotion from *SLP*, its data showed that there was a great improvement in participants' food choices, especially in male students. (Grainger, Senauer, & Runge, 2007) It was also found that school's *NSLP* participation could lead to an increase in children's intakes of essential vitamins and minerals. (Gleason & Sutor, 2003)

2.4 Primary Education System in Thailand

Historically, the political, administrative, and fiscal systems in Thailand used to be

centralized and its organizational structures were very complicated. In response to this, Royal Thai Government amended policies and systems including the educational administration. The bureaucratic reform was aimed to decentralize management power to the local agencies level. Yet, there still are 5 different offices involved in the Thai formal educational system that each is responsible to the specific type of schools as follows (MOE, 2006):

Table 1: Major agencies with their responsible schools

	Major Offices and Agencies	Responsible to:
A	Office of the Basic Education Commission, Ministry of Education (MOE)	General public schools in Thailand
B	Office of Private Education Commission, Ministry of Education (MOE)	Private institutions in Thailand
C	Office of Local Administration, Ministry of Interior (MOI)	General public schools in other province than Bangkok
D	Bangkok Municipality Administration (BMA)	General public schools in Bangkok
E	Organization under Prime Minister, Boarder Patrol Police Command	Special schools located in remote area

* Higher education system has different organization from above.

The basic primary education is provided free for all Thai children therefore, every child has an opportunity to be educated regardless of their social economic status or family background. From September 2002, the compulsory education was extended to nine years from six years so children would now spend more years in the schools. (MOE, 2004) Although an environment and condition of the schools may differ from school to school, the basic curriculum should not be so much different. Students learn academic skills as well as other basic life skills while they are in primary schools. Thus, education in diet, hygiene and physical exercise during this time is substantial for their physical and mental growth.

In general, public schools are where majority of Thai children study at. In Bangkok, general public schools are under jurisdiction of either *MOE* (A in Table 1)

or *BMA* (D in Table 1). Currently, there are about 430 public schools that belong to *BMA* while only 38 of schools belong to *MOE*. These schools are not established independently for gain any profit, but they belong to the government that aims to give basic education equally for all children in Thailand.

2.5 Quality of School Lunch

Providing nutritious food is very important. A quality lunch includes sufficient energy and nutrients which will not only nourish school children, but it also helps to maintain their normal body weight. Healthy school meals should certainly be high in quality. (Mitchell, 2003) Ideally, each meal provided by schools should be consisting of at least one-third of the Recommended Daily Allowance (*RDA*) value in energy and nutrients. The lunch also should include variety of food to be a balanced meal and the menu should be developed considering the servings of each core food group: meat, fruit and vegetables, rice and starch, milk, and lipids. (USDA, 2007) Sanitation practices such as using clean utensils, non-contaminated food, and safe food handling are too considered as a part of quality lunch.

Currently, the United States Department of Agriculture (*USDA*) regulates the general nutritional requirements for American school meals. In addition, the Center for Disease Control and Prevention (*CDC*) has also identified seven aspects of school-based healthy eating program that are: school policy on nutrition; a sequential, coordinated curriculum; appropriate instruction for students; integration of school food service and nutrition education; staff training; family and community involvement; and evaluation program. (CDC, 1996) Hence, the goal of American public schools is set to prepare school lunch with at least enough food to meet the required calories and nutrients.

In Thailand, quality of school lunch in terms of nutritional aspect has also concerned. The *RDA* for Thais was first developed by *MOPH* in 1989 so the recommendation of energy and nutrients value for school lunch was made based on this information. (MOPH, 2001) The goal was set for the schools to provide the lunch with these values and it is described in Table 2.

Table 2: Recommended energy and nutrients for school lunch

	Students' age group			Average
	Kindergarten (age 4-5)	Grade 1 to 3 (age 6-8)	Grade 4 to 6 (age 9-12)	
Energy (Kcal)	520	560	660	600
Protein (g)	10	11.2	16.8	18*
Fiber (g)	4	4.8	6.4	5.3
Vitamin A (RE)	180	200	240	215
Vitamin B ₁ (mg)	0.24	0.24	0.36	0.3
Vitamin B ₂ (mg)	0.24	0.24	0.36	0.3
Vitamin C (mg)	16	16	18	18**
Calcium (mg)	320	320	400	360
Iron (mg)	3.2	4	7.8	5.5

*Calculated as 12% of total calorie

** Maximum amount is taken

Source: School Lunch Program Handbook by MOPH

More information and recommendation regarding healthy eating were made available to public and health providers when the country started to focus on healthy eating promotions. For instance, the national dietary guideline was published in 1998 by *MOPH*, which stated that children aged 6 years and over should (MOPH, 2001):

- Eat a variety of foods based on five food groups and maintain their proper body weight
- Eat rice as a staple food and eat other starchy foods occasionally
- Eat plenty of vegetables and fruits
- Eat fish, meat, eggs, and dried nuts regularly
- Drink milk in quantities appropriate for the age
- Eat a low fat diet
- Choose a diet moderate in sugars and salt
- Eat clean food



Figure 1: “Nutrition Flag” Healthy Eating for Thais (MOPH, 2001)

A visual image called “Nutrition Flag” (Figure 1) has also created and distributed to public. This picture shows the practical dietary suggestion based on the Food-Based Dietary Guidelines (*FBDGs*) for Thais. The *FBDGs* have been developed to use as a tool to help people choose appropriate food and prevent diet related disease. This is also designed to assist professionals or any health providers to develop and implement nutrition interventions. It is thus encouraged for schools to use this information to prepare nutritionally balanced school lunch. (Sirichakwal & Sranacharoenpong, 2008; Kraissid Tontisirin & Bhattacharjee, 2001) Ideally, a balanced meal should be consisting food from every core group with appropriate serving size. (MOPH, 1992) The core food groups and its recommended portion sizes are shown in Table 3 below.

Table 3: Recommended serving size for each food group

Food group and serving size	Kindergarten	Grade 1 to 3	Grade 4 to 6
Rice (serving spoon)	1.5	2	3
Meat (table spoon)	1.5	2	2
Vegetable (serving spoon)	1	1	1
Fruit (portion)	1	1	1
Milk (glass)	1	1	1
Oil or lipids (tea spoon)	1	1.5	2

Source: Handbook for School Lunch Program prepared by *MOPH*

2.6 Related studies in Thailand

Up this date, numerous studies were completed reporting the *SLP* in Thailand. Many researches focused on the *SLP* in a rural area because more children were malnourished than urban area and nutrition interventions were often conducted in remote area to solve the nutritional problems. Several government sectors have been involved in *SLP* in Thailand but the recent reorganization of government structure has delayed the evaluation of the program at national level. Though the *SLP* has finally studied by *MOPH* and *MOE* in nationwide, its results are yet to be published. Instead, several studies carried out after the *SLP* has implemented by law are reviewed in this section.

From the previous studies, several of them pointed out the lack of budget and funding for the *SLP*. (Banchonhattakit, Nathapinthu, Sota, & Polbunta, 2000; Praditnuch, 1995; Sangwirach, 1998) In Surin province where the cost of *SLP* was analyzed, it was found that the given budget was only enough to cover malnourished and poor students but not for the all. It reported a need of additional support to provide free lunch for every student. (Phuddee, 2000)

Other studies also reported about the quality of school lunch in terms of its nutrients contents. A common finding was that many schools could not provide lunch

with adequate energy and nutrients. When 170 primary schools under Border Patrol Police in nationwide were studied, it was found that total energy of school lunch consisted on average was 77% of the recommended amount. Only the amount of protein was met with target value but other micronutrients were counted less than recommended value. (Inthivorn, 1998) In Bangkok, Sangwirach studied the nutritional impact of *SLP* and School Milk Program among students at *BMA* schools. The study found that both programs were effective to improve underweight students' nutritional status. However, it was pointed out that school lunches contained energy and nutrients less than the recommended values. Especially some micronutrients such as Vitamin A, B1, B2, and Calcium were provided at less than 50% of the target amount (34%, 45%, 48%, and 19%). (Sangwirach, 1998) Another study was also carried at Phetchabum Province. It was found that the school could provide enough calories, but the energy distribution was inappropriate indicating the lunch was not provided with well-balanced food. (Naogeaw, 2001)

During the year 2000, a comparative study was conducted in Khon Kaen province and context and process of the *SLP* in urban and suburban schools were described. The main finding of this study was the lack of budget in both type of schools and some factors to be success in *SLP* were identified as follow: money, involved personnel, school directors, management, and water. (Banchonhattakit, Nathapinthu, Sota, & Polbunta, 2000)

Despite nutritional information including Nutrition Flag and Healthy Eating guideline were made to be used and incorporated in the *SLP*, only a little research was done evaluating schools' healthy eating policy implementation. Korwanich et.al., reported the degree of healthy eating policy implementation in Phrae province. Among the 47 public primary schools studied, 57% of them had written and placed

the policy, indicating that many schools were concerned about healthy eating. (Korwanich, Sheiham, Srisuphan, & Srisilapanan, 2007) Yet, it was found that only 17% of the schools had specific guidelines for actual practices. The study concluded stating there was a need to develop a health-promotion model and improve the current situation. (Chotiboriboon, Smitasiri, Indrambarya, Sirichakawal, & Poonswan, 2001)

Like many other countries, Thailand is facing the changes in nutritional trend. Due to the rapid economic growth and social change in the past decades, the trend of overweight and obesity in Thai children is now receiving a great attention especially in Bangkok. (ThaiHealth, 2006) More children now prefer to eat fast food, which usually consists of high amount of fat and sugar. Their diet behaviors altered from traditional Thai diet to western influenced, convenient diet. (Kosulwat, 2002) Although the prevalence of overweight and obesity seems to be increased more among the private school students than in the public schools or rural area (ThaiHealth, 2006), this indicates the need of focus in school nutrition program. Therefore, *SLP* can be an important source to reinforce children the healthy diet and reconsider their diet behaviors.

CHAPTER III METHODOLOGY

3.1 Study Design

This is a cross-sectional descriptive study using both quantitative and qualitative information. The secondary data from *MOPH* was used partially to analyze and compare the *SLP* situations in detail between schools under *BMA* and *MOE*.

3.1.1 The research design of the most recent MOPH Study

In early 2007, an evaluation study for *SLP* was conducted by *MOPH* together with *MOE*. This was the very first study in Thailand which targeted the variety of schools in nationwide to research covering many topics related to the *SLP*. Assessments were focused on evaluating context, input, process, and product of the *SLP*. Perceptions and satisfactions information were also collected by distributing surveys however, the completion of this study is still underway.

3.1.2 The design of this Study

This study was carried a year after the *MOPH* collected the data from selected primary schools in Bangkok. The purpose of this particular study was to improve understanding the difference of the *SLP* in public schools under different authorities and to examine resource needs that schools perceive with regard to improving their current practices. This study also focuses on qualitative approach to investigate since the *MOPH* has done quantitative surveys.

3.2 Study Sample and Study Site

Previously, the data were collected from all type of schools from all provinces in Thailand. This study targeted only some of the public primary schools in Bangkok area in order to take closer look at school lunch activities in each institution.

3.2.1 Study Sample for MOPH study

In *MOE* and *MOPH* study, more than 1,300 schools were studied. First, all provinces were divided into twelve regions and Bangkok. The schools were selected from both urban and rural area in each region. For Bangkok, total of 9 schools from *BMA* and *MOE* were chosen as representatives because these schools were considered homogeneous and would best describe the realistic situation. Of the 9 schools studied previously in Bangkok, 6 of them were from *BMA* and 3 were from *MOE*. According to the procedure of this study, schools were divided into 3 size categories:

- a) Large size schools are with students more than 500
- b) Medium size schools are with students more than 121 but less than 499
- c) Small size schools are with students more than 0 but less than 120

Based on these, the schools were selected to describe variety situations. The summaries are described in Table 4.

Table 4: Characteristics of previously studied schools in Bangkok

	MOE			BMA					
Schools	1	2	3	4	5	6	7	8	9
Location	S	S	U	U	S	S	U	S	S
Size	M	M	L	L	M	M	Sm	L	Sm

* S indicates Suburban: U indicates Urban area

** Sm indicates Small size: M indicates Medium and L indicates Large

3.2.2 Study Sample for this study

Due to the limited time and resource for this study, 6 schools were selected to study and compare the situations. The selected schools were from 1 to 6 from

the Table 4. Consequently, 3 schools from *BMA* and another 3 schools belong to *MOE* were studied.

3.3 Research Instruments

Followings are instruments used for this study:

- Interview guide (based on the previous questionnaire made by *MOPH*)
- Observation checklists
- Photography
- Previous data sets from *MOPH*
- Menus and student's nutrition status reports

3.4 Data Collection

The data was collected mainly by interviewing and field observation.

3.4.1 Qualitative Data Collection

Key Informant Interview

An interview guide was prepared based on the questionnaire from the previous *MOPH* studies and it was adjusted for this specific study. The guide was used to ensure that the same basic lines of inquiry are pursued by interviewee. Background questions were asked to school directors by a researcher because most of school directors were able to communicate in English at some extent. The rest of questions regarding the program were asked to school lunch teachers through a translator.

Casual/Informal Interview

To obtain further information, unstructured questions were used to allow them express freely about their thoughts. Opinions and values questions were asked during the casual conversation with school directors as well as school lunch teachers. Some were able to speak English so a researcher asked few questions directly regarding school lunch process and their opinion towards the program.

Cooks and cook helpers were also available to be interviewed at most of institutions. Questions were asked casually through an interpreter.

Direct Observation

A researcher visited each school twice at least to observe the facilities and process of the school lunch. The first visits were before and during the lunch time so that the researcher could see the preparation of meal and students' behavior when they were served and ate lunch. The facilities, equipment, and environment were observed once again during the second visits. Observation was recorded in notes and pictures were also taken.

3.4.2 Quantitative Data Collection **Student nutritional status report**

The secondary data were used to evaluate students' nutritional status. The most recent report was collected from each school. The report consists of the students' information on height and weight and the number of students who are over and under weight.

The nutritive values of school lunch

The 5-day menus were collected to examine variation of food in school lunch. Food components were analyzed from the raw ingredients on the menus. In addition to this, the secondary data from *MOPH* was also used to compare the macro and micro nutrients value of school lunches.

3.5 Data Analysis

3.5.1 Qualitative Data Analysis

The general characteristic of the studied schools, observed information, and actual practice of the *SLP* were sorted into themes and analyzed in a descriptive manner.

3.5.2 Quantitative Data Analysis

The nutritive values of food on the menus were calculated using the Nutritive Values of Thai Foods published by *MOPH*. Macro and micronutrient values of the school lunches were obtained from the secondary data and analyzed by comparing with the recommended values in guidelines.

3.6 Ethical Considerations

An approval to conduct research was requested from the Ethics Review Committee in the Graduate Faculty at Chulalongkorn University. The researcher and interviewer explained the purpose of this study in writing to each school director before their actual visits. Objectives and process of the study were once again presented to interviewee before each interview. All participants were told that they have the right to refuse or withdraw from the study at any time. Related information was collected upon the completion of agreement between the researchers and participants. The data will not be used for other than this project. At a completion of the study, the result of this study will also be provided to each school along with some recommendation and suggestion from the researcher.

ศูนย์วิทยทรัพยากร

จุฬาลงกรณ์มหาวิทยาลัย

CHAPTER IV RESULTS

This study was carried out in total of 6 primary schools in Bangkok three were under jurisdiction of *BMA* and the other three were under *MOE*. All schools were located either in urban or suburban area of Bangkok, consisting most of students from low-income families. Locations of the schools are explained as below:

BMA schools: one located in urban area (Khlong Toei) and the rest are in sub-urban area (Prawet and Talingchan).

MOE schools: one located in urban area (Huai Khwang) and the rest are in sub-urban area (Talingchan and Min Buri).

For this study, a qualitative methodology was mainly employed using interview and direct observation. The researcher visited each school to collect the data at least twice during the regular school days. The secondary data from *MOPH* was also used to further investigate the quality of school lunches.

4.1 General Characteristics of the Schools

The number of students ranged from 200 to no more than 600 children in each institution. All schools included students from kindergarten to grade six. Characteristics of the studied schools are summarized in Table 5:

Table 5: School characteristics information

	School Type		
	Total (n = 6 schools)	BMA (n = 3 schools)	MOE (n = 3 schools)
Enrollment, average	361	360	362
Pre-school students, %	17.0	15.8	18.2
Grade 1- 6 students, %	83.0	84.2	81.8
No. of schoolteachers, mean	19.5	17	22
No. of years available SLP, mean	21.3	19.3	23.7
Cost of SLP per day	฿3,588	฿3,426	฿3,759
Cost of lunch per student/day, mean	฿10.22	฿9.86	฿10.57

4.2 Qualitative Results

4.2.1 Key Informant Interview

First, interview was held with a schoolmaster or director at each institution regarding general environment and situation of the school. When the director was not available, questions were asked to an assisting director and most of them were women. Some of them were able to communicate in English to some extent so questions were asked directly by a researcher followed by a translator. To obtain further information, interview was held with school lunch teachers. Questions were asked using an interview guide. Each interview lasted up to an hour; questions were translated and asked mainly by an interpreter. Some major topics and questions asked were summarized in the Table 6. The findings from the interviews were sorted into several themes and compared among the schools later in this chapter.

Table 6: Overview of major topics and some questions asked

Interviews with Schoolmaster/Directors	
Topics	Sample Questions
General Information	<ul style="list-style-type: none"> • How many personnel are assigned for the SLP? How they are selected? • What is the current condition of SLP?
School's participation in health promotion	<ul style="list-style-type: none"> • What types of school health programs are offered to students and what is the schools' concern or concept of healthy eating practices?
Challenges/Barriers	<ul style="list-style-type: none"> • How do you feel about the current SLP in your institution? • What is the most difficult thing to operate SLP?
Interviews with School Lunch Teachers	
Topics	Sample Questions
SLP Input -Budget -Human resources -Facility and equipment	<ul style="list-style-type: none"> • How much money is spent for SLP in a year? • How much is received? • Who are involved in what role? • How food is purchased? • If any guideline/policy is used to operate SLP.
SLP Process	<ul style="list-style-type: none"> • How the lunch is planned and prepare? • How do you develop the menu?
Output	<ul style="list-style-type: none"> • What type of lunch is provided to students? • How would you secure the quantity and quality of food? • Is there any educational program provided along with the SLP?
Challenges/Barriers	<ul style="list-style-type: none"> • What is the most difficult thing to operate SLP? • What challenges, if any, do you encounter on regular basis that make your job difficult?

4.2.2 Informal/Casual Interview

The researcher was given opportunities to meet several other personnel and staff including schoolteachers, cooks, and accountants. Information was gathered through the casual conversation with them. Their personal opinions and comments on *SLP* were collected from them during the casual conversation at lunch time. The major findings are summarized in Table 7.

Table 7: Summary of results from informal interview

Topics	BMA Responses	MOE Responses
Budget	-Though the budget arrives late most of the time, the school created the way to save and pool some money for SLP. It is not too difficult to manage financially at this moment. (SLT, ACT, DR)	-The current budget is not enough at all to prepare the meal in the school (SLT and DR) -Sometimes, teachers' own money is used to match with an increased food price.(SLT)
	-Supportive budget comes from BMA and this helps a lot and this can be too much sometimes. (SLT)	-The budget should be raised to 15 baht instead of 10 baht since everything priced up these days.(SLT and DR)
		-It is very difficult to convince parents to pay extra money for SLP (SLT, ACT, DR)
Food Purchasing	-Supplier is very reliable and it's easy to order on daily bases (SLT)	-Some fresh products' price are not stable so it's difficult to develop menu and order in advance (SLT)
		-“Vendors buy food and we only inspect them before they cook.” (SLT)
Facility and Equipment	-Kitchens are well organized (CK)	-“We definitely need more space for cooking area” (SLT) -“Washing area is too small and it makes difficult in floor arrangement” (SLT)
		-“I'd like to change the system, but I don't know how to start” (SLT)
Management System	-“Support from other teachers helps program and we often have meetings”(SLT)	-“It became less work after vendors came in to prepare for everything. This is good for us.” (SLT and DR)
	-“We think we manage everything pretty well” (SLT and TR)	
Parents' Aspect	-It is not easy to convince parents about the importance of nutrition but the school is trying in the way that we can.(SLT)	-The school held meeting/seminar for parents to inform obesity issue and this will be a good start (DR)
	-Some parents are very protective and they complain about school lunch so it is overwhelming sometimes. (DR)	-The school gets less complaints from parents because vendors/chef are students' parents (DR)
	-“Dealing with parents can be overwhelming sometimes” (DR)	
Students' Behavior	-Students prefer to eat western style dessert more than Thai traditional dessert. (SLT and TR)	-Some students do not like to eat vegetables and it's difficult to change their behaviors.(SLT and TR)
	-We try our best at schools providing healthy options but cannot force them strongly when they go home (DR)	
	-“Some students don't like to eat vegetables at all” (CK)	

*Respondents are indicated as follows: DR = Schoolmaster/Directors, SLT = School Lunch Teachers, TR = Schoolteachers, CK = Cooks/Cook helpers, ACT = Accountant

4.2.3 Direct Observation

The researcher visited each school and observed meal preparation process and actual work flow during the lunch time. Facilities, kitchen area, and dining hall were also observed as well as school teachers' activities and students' behavior. Main findings are summarized in Table 8.



Top left: Cook and cook helper are serving lunch to student at BMA school.

Top right: Students eat lunch at dining hall

Bottom left: Fried rice and soup prepared for lunch

Bottom right: Student's plate

Table 8: Summary of findings from observations

Observed area	BMA	MOE
Kitchen and equipment	<ul style="list-style-type: none"> -Spacious kitchen with storage area -Fully equipped and kept clean -Nutrition information and menus were displayed in visible place 	<ul style="list-style-type: none"> -Limited cooking and storage area -No complete kitchen was available -Some equipment was limited -Not much nutrition information or poster was available
Cafeteria and dining hall	<ul style="list-style-type: none"> -Most students could sit and eat at cafeteria at the same time -Selected condiments and drinking water are also made available -A table for teachers are also placed near students' 	<ul style="list-style-type: none"> -Space is limited and not all are able to eat at the same time -Students eat in the classrooms when it rains (not all area had roof) -Table and chairs were well-equipped
Cooks/Chefs' appearance	<ul style="list-style-type: none"> -Wear hair cover (cap), apron, or uniform all the time -Use gloves when cooking 	<ul style="list-style-type: none"> -Some cooks did not wear any hair cover but all were wearing apron
Cooking Process	<ul style="list-style-type: none"> -Food was cooked thoroughly, and stored or covered carefully -Area was always kept clean 	<ul style="list-style-type: none"> -Preparation area was not appropriate (food is not cut on the table) -Food was covered and kept -Cooking area was kept clean
Serving and its portion size	<ul style="list-style-type: none"> -Cooks and teachers serve for lower grade students and upper grade students often serve themselves -Food is served according to students' body size -Use lunch plates according to their grade and age 	<ul style="list-style-type: none"> -Vendors or teachers serve food mainly -Portion size seemed inappropriate for pre-school students. Many students did not finish everything on the plate.
Food appearance	<ul style="list-style-type: none"> -Clean plates are used and served appealingly. 	<ul style="list-style-type: none"> -Food is served on the regular plates, usually served one dish over rice. -Food looked attractive with several selection offered by vendors
Washing area	<ul style="list-style-type: none"> -Well-organized floor plan and no traffic flow 	<ul style="list-style-type: none"> -Space was limited -Located inappropriately (too close to kitchen or serving area)
Teachers' involvement	<ul style="list-style-type: none"> -Supervising teacher communicate with students -Assigned teacher write "school lunch diary" everyday to keep as a reference 	<ul style="list-style-type: none"> -Classroom teachers often supervise students while eating -Teachers are involved for serving but do not overlook while students eating
Students' consumption	<ul style="list-style-type: none"> -Most students ate well and they seem all happy with the taste -Many students requested for second round. 	<ul style="list-style-type: none"> -Some students tended to eat only the food they like and they leave the vegetable on the plates -Not all students eat school meals (some brought food from outside or parents were bringing some food for them at lunch time)

4.3 Situation comparison of School Lunch Practice

All findings and results from the interview and observation were gathered and sorted into categories to compare the overall situation at *BMA* and *MOE* schools.

4.3.1 Resources and input for *SLP*

- **Policy and guideline**

BMA: Most of school lunch teachers responded that they knew about the most recent *SLP* guideline which was developed and distributed by *BMA* in 2007. They also possessed a handbook or other related information from *MOPH* and the information were utilized for their planning processes in particular.

MOE: All three schools had less response about this issue. Though two schools did have information from *MOPH*, it seemed the guideline was ignored or not used so much. One of the schools didn't even possess information booklet or any related information regarding *SLP*. Thus, the level of policy implementation was lower at *MOE* schools than *BMA* schools.

- **Manpower**

The organizational structures were the similar in *BMA* and *MOE* schools. All schools placed one school lunch teacher to be responsible to run and overlook the *SLP* in total. Some of them had nutrition knowledge or background education but it was not a requirement to be a school lunch teacher. In most schools, they were in the position for long time and were replaced by new teacher only when they retired or moved to other schools.

Many schools appointed 3 to 5 schoolteachers as school lunch committee members to be included for the program management. But, not all schools were able to get them involved actively. Beside the committee members, one or more schoolteachers were assigned each day to participate in

supervising or serving food during lunch time to encourage all to be involved. This was the common pattern in all schools, yet it was obvious duties were not evenly shared among all and their incoherent involvement was observed at some schools.

In general, teachers' commitment to the *SLP* seemed lesser at *MOE* than *BMA* schools. Several teachers at *BMA* schools responded that they discuss and hold meeting constantly. On the other hand, school lunch teacher at *MOE* schools were sometimes taking solo responsibility for the *SLP* and no meeting for *SLP* was held as often as *BMA* schools.

- **Budget**

All schools received 10 baht per enrolled student for every school day (= counted as 200 days per year) from the School Lunch Fund.

BMA: At least two out of the three schools received an extra budget for *SLP* from the local government in addition to the main funding. This amount was different in each school yet this support from the local government office was quite significant them as some teachers mentioned this would help when the budget from the School Lunch Fund did not arrive on time.

MOE: Unlike schools under *BMA*, no additional funding came from the local government to the three schools. The *MOE* schools thus need to seek more independently in finding their own resources. For example, one of the schools was collecting extra 2 baht/day from parents to support the *SLP* in addition to given 10 baht. This fee is collected in the beginning of the semester so to be used when main budget does not come on time. On some occasion, the school also received food as donation from surrounded organization. However, a school where the financial support only comes from the School Lunch Fund

was suffering from managing budget. The school director and teachers expressed the need of more help from other places.

- **Facility**

BMA: All had well-equipped kitchen within the school. These kitchens provided enough space for cooking and some area for storage. Dining hall or eating area could occupy at least a few hundred students at a time. Often time, pre-school children ate at earlier time to reduce the traffic and make some seats available for other students.



A well equipped kitchen at a *BMA* school.

MOE: Among three *MOE* schools observed, conditions of kitchen and dining hall looked much simpler than that of in *BMA* schools. Not all schools had enough space for preparation and number of school lunch teachers mentioned that they think this was causing a problem. Dining hall or eating area also seemed limited and total area was smaller than *BMA* schools'. A director mentioned that the school had no dining hall until few years ago so students were eating lunch in the class room at that time.



Limited space of dining area at a *MOE* school

4.3.2 Process of school food service

- **Types of lunch service**

School lunches were prepared in three different ways.

A) *Cooked on the site* –in this method, school lunches were cooked and prepared within the instituted kitchen. This also means that schools purchase raw ingredients, supervise cooks and cook-helpers, and take responsibilities in all process. Only one of *MOE* schools used this system while all *BMA* schools prepared lunch with this method.



B) *Inviting vendors* –Although the small kitchen was facilitated in the school, a *MOE* school invited vendors from outside and food was cooked and delivered by vendors to the school each day. A school lunch teacher gives a menu to vendors a week ahead so vendors prepare food accordingly. Food is purchased by vendors and school pays for it everyday. This system created less workload for schoolteachers, but quality assurance can be compromised with this method.

C) *Coupon system* –Only one of the *MOE* schools used coupon system, in which students could exchange the coupon with food (rice with one dish) each day. Each student is given a coupon in the morning and one coupon means worth of 10 baht which is date stamped to be used only the same day. There are several kinds of dishes prepared everyday but the student can select only one in exchange of this coupon. The school will then pay to vendors according to the numbers of coupon collected from students. Vendors will buy ingredients outside by themselves and deliver food or they cook some items in the school kitchen. Again, this system requires less workload from schoolteachers which also results less direct involvement towards the school lunch service.



A sample of coupon used for the school lunch

- **Management**

In general, main processes of the *SLP* include menu planning, food purchasing, food preparation, quality control, and monitoring. The school lunch teacher is thus responsible in administering for the management of these processes. Of course, the directors, school lunch committee members and other schoolteachers should be active personnel to help and support all the processes. However, degree of their involvement seemed altered depending on the school and its lunch service system. Main actors to take action in each process were identified by observation and interviewing.

Table 9: Comparison of main actors for managing processes

Processes	Involved main actors for each type of service		
	Cooked on the site (A)	Inviting vendors (B)	Coupon system (C)
Menu planning	SC	SC/VR	SC/VR
Food purchasing	SC	VR	VR
Food preparation	SC	VR	VR
Quality control	SC	SC/VR	SC/VR
Monitoring	SC	SC	SC

SC = School personnel (directors, school lunch teachers, schoolteachers, hired cook)

VR = Vendors from outside

It was found that schoolteachers share their roles with vendors when schools provide lunch through service type B and C. This actually resulted in reducing workload for schoolteachers and some were happy about this because they had many other duties to take care of. A director and school lunch teacher admitted that inviting vendors was advantageous as they had to spend less time to plan menus, calculate the food price and purchase raw ingredients. In short, providing school lunch through vendors requires lesser involvement and management by schoolteachers than preparing school lunch on the site (service type A). Disadvantage for this however, is that the indirect food service can affect on the quality of lunch due to the lack of sufficient supervise

and management system.

- **Menu Planning**

BMA: School lunch teacher was mainly planning menu on weekly bases. All said they use some recipes from the guidebook, but they had to modify or adjust some food depending on available vegetable in each season. Students' requests were often incorporated when developing weekly menu. A school actually placed a box so the students could write their favorite items on a piece of paper and drop it into the box. Some teachers said that they would like to fulfill students' preferences and they thought that it was important part of the lunch program.

MOE: When schools have contract with vendors outside, menus were sometimes developed by vendors. According to a school lunch teacher, vendors plan menu weekly and submit it to get approval from a responsible teacher. In this case, the schoolteacher admitted that menu was developed concerning more about budget than nutritional contents. The school where the lunch was prepared in the school kitchen, a school lunch teacher was planning menu. However, recent increase of food price made difficult for teachers to plan menu well in advance. She explained planning menu too early could result money loss due to the unstable food price. Consequently, one of the *MOE* schoolteachers could plan the menu only two days in advance so that the adjustment of price can be minimized.

- **Food Purchasing**

BMA: All schools contracted with suppliers near by, so raw food was delivered on daily basis. The schools make orders daily or weekly depending on items and amounts on the menu. The products of supplier are often

examined by formal authorities (such as *FDA* or the department of health under *BMA*) as well as by schoolteachers to inspect contamination and to ensure the quality of food.

MOE: A school was also buying food through a contracted supplier, but not all foods were purchased through this way. In one school, rice and fruits were purchased at the market by responsible teacher on regular basis. Also, the school lunch teacher had to pay from her own pocket when the market price of food was increased more than she estimated. She complained that she would have to spend up to 1,200 baht in a month sometimes. Relentlessly she does not ask other teacher to cover or share the cost but she certainly thinks that the given budget is not enough to run the program at all especially with recent food price inflations. Other *MOE* schools, where school lunches were prepared from outside, seemed to rely more on vendors or cooks for purchasing as well as cooking process. These schools did not have any contracted food supplier. Thus, the quality and safety of raw food can be questionable.

- **Food Safety Practices**

The majority of respondents stated that they were very careful about avoiding food with pesticides or other toxic substances. Food safety issues, in general, were more concerned among directors and schoolteachers. Most schools selected an authorized food supplier when they purchase in bulk so the food quality is well regulated. In addition, responsible local agency visits each school to sample the school food and water to inspect the safety at least once a semester. This may be due to the government's effort enforcing policy that the food to be inspected on constant base.

Food safety practices include management of sanitation. Especially if schools facilitate kitchens, it is essential to keep the area clean all the time. When school lunch is prepared in the kitchen, cooks and cook helpers were responsible in cleaning process. At most schools, uniform (hair cover and aprons) were provided and their food handlings such as wearing hand groves were practiced well except one *MOE* school where less restriction seemed to be applied.



Cook's uniform at a *BMA* school

- **Evaluation and Monitoring**

Both *BMA* and *MOE* schools had some professionals from outside to evaluate the *SLP* at least once a year. There is no single agency taking responsibility in monitoring and evaluation process in *SLP*. Sometimes, inspections are done more than once a year to evaluate different area by responsible authorities. Each school was given its results and suggestion from them however their management and system was never evaluated in either type of institution.

BMA: The local health offices under the local government are responsible for monitoring school children so they provide *SLP* evaluation including any health related services.

MOE: The officials from *MOPH*, Food and Drug Administration (*FDA*), and *BMA* visited school to examine the school lunch. The inspection was mainly for cleanliness and food handling practice. Only serving size and outlook of school lunch were evaluated.

4.4 Quantitative Results

4.4.1 Menu analysis

Most schools developed weekly menu in advance and lunches were prepared accordingly. The menus for 5 days (1 week) were collected from the schools and each was reviewed. Different type of lunch was found among the schools and it is summarized in the Table 10.

Table 10: Types of lunch provided by schools

Types of lunch provided	BMA schools	MOE schools
	Frequencies in one week (%)	
One plate dish with rice or noodle	6.7	86.7
Two cooked food with rice or noodle	26.7	13.3
One plate dish with rice or noodle plus fruit/dessert	33.3	0
Two cooked food with rice or noodle plus fruit/dessert	33.3	0

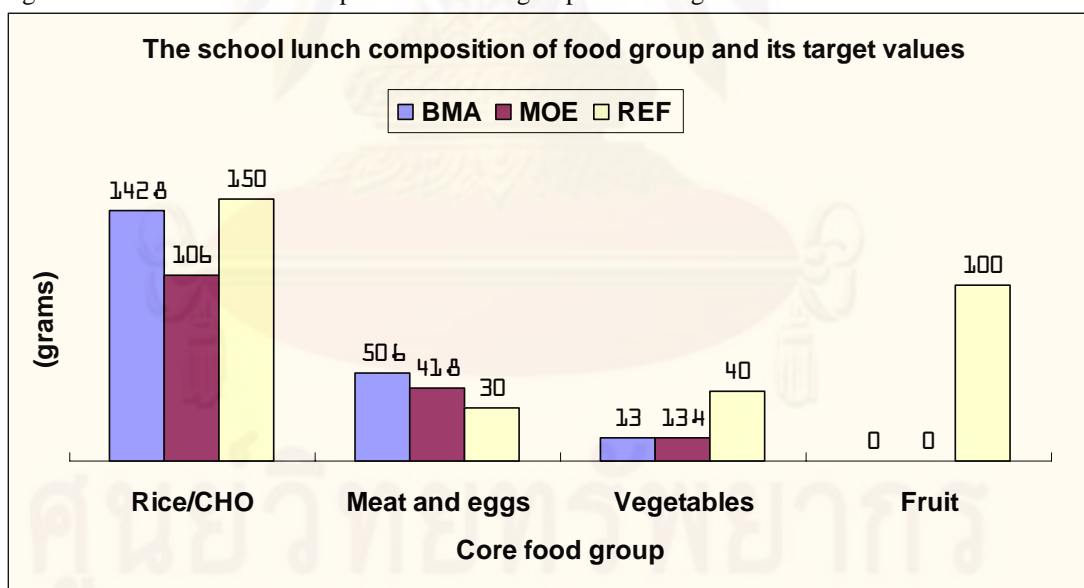
On average, the *BMA* schools offered complemented meals (meaning two cooked food with rice/noodle) more often than *MOE* schools. It also showed that *BMA* schools were providing more items and variation of food when compared to *MOE* schools. Some schools seemed to offer fruits every other day or every other week, but none of *MOE* schools provided either fruit or dessert in addition to the lunch. These items were only available at canteen

from vendors at *MOE* schools.

Food components of school lunch

In general, ingredients lists were made to purchase food for *SLP*. However, not every school did record the ingredients and amount of food they used or purchased every time. Instead, only the name of dish was recorded at some schools. To identify the food components in school lunch over one week, 5-day menus were studied. Each item on the ingredients list was categorized under basic food groups: rice/starch, meat/eggs/meat alternate, vegetable, and fruit. Its amount was calculated by total weight purchased divided by number of servings estimated by schoolteachers. The average of food components for a day was calculated and compared with recommended amount. The results are shown below:

Figure 2: The school lunch composition of food group and its target values



*REF = Targeted values

Both schools provided lesser amount of fruit and vegetables than recommended portions. In particular, no fruit was provided here although it was suggested to consume more portions than vegetables. Instead, meat and eggs were provided more than targeted value at both type of schools. Rice or

noodles were provided almost equal to the recommended amount at *BMA* schools, but slightly less at *MOE* schools.

Popular items on menu

All schools provided noodle dish at least once a week. There were some other items that appeared quite frequently in the collected menus. School lunch teachers stated that those were students' favorite dishes. Here are menus appeared more than twice among the collected menus from all schools:

- Khao moo dang (rice with barbequed pork and sauce)
- Khao man kai (rice with deep fried chicken served with chicken broth)
- Khao phat (fried rice with choice of meat and vegetables)
- Kuay tiew moo (rice noodle with pork)
- Kuay tiew lad nhar (rice noodle with pork and Chinese kale in gravy sauce)
- Phat kraphraw moo (rice with fried pork, long bean, chili, and basil)
- Kang kai (rice with chicken curry)

School lunch teacher mentioned that many students preferred to eat food with less vegetable contained menu such as Khao moo dang, Khao man kai, and Phat kraphraw moo.

4.4.2 Comparison of nutrients using secondary data

Nutrition contents data of the school lunch were obtained by *MOPH* last year using much precise techniques. Students' plates were randomly collected to weigh actual amount of food provided by schools. At each institute, at least 8 plates were weighted to determine the portions of each food given to students.

Its nutrition values were then calculated by using computer software.

Comparison of the caloric distribution of school lunches

Using the data from *MOPH*, calories from the macronutrients in a meal was calculated and its distribution was compared as shown below:

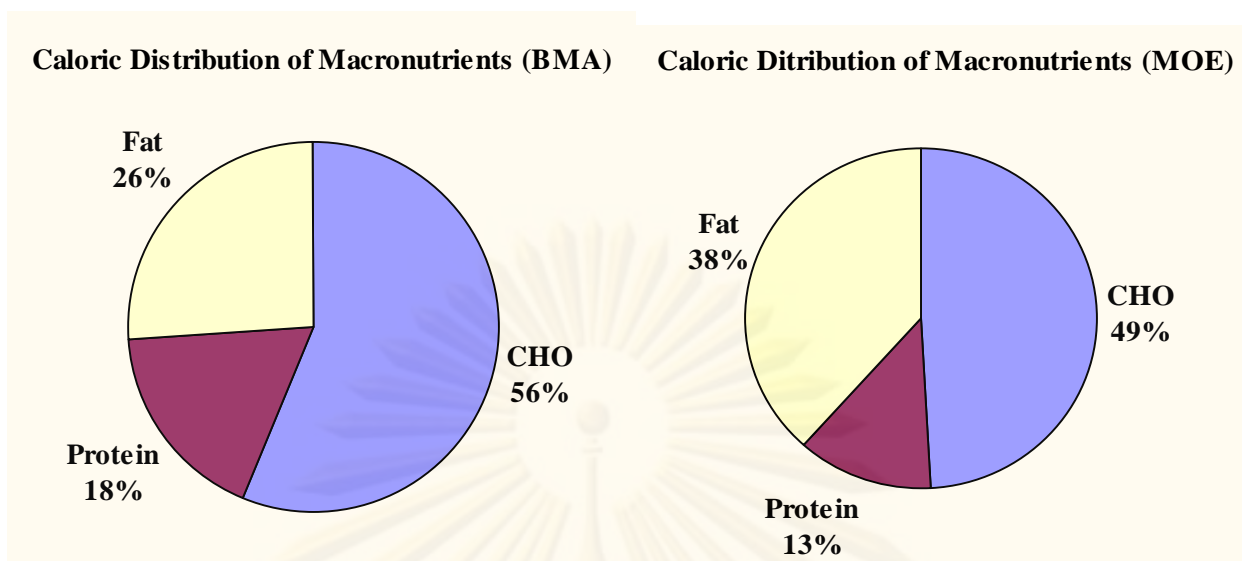


Figure 3.1 The average percentage of caloric distribution of school lunches at *BMA*
 Figure 3.2 The average percentage of caloric distribution of school lunches at *MOE*

According to the recommendation from *MOPH*, an ideal ratios are as follows;

CHO: Protein: Fat = 55-75 (%): 10-15 (%): 15-30 (%)

The data showed that most calories came from carbohydrate in both schools, which probably were from rice or rice noodles, but *MOE* schools provided less than recommended amount. The proportion of protein and fat was slightly different between *BMA* and *MOE* schools. Especially, it was shown that calories from fat were 8% more than target amount at *MOE* schools. Overall, *BMA* schools provided better proportion of macronutrients from energy which suggests their lunches were consisting of more nutritionally balanced foods than that of *MOE* schools.

Comparison of micronutrients in school lunches

Using the data from *MOPH*, the average of micronutrient contents in school lunches were also compared with the targeted values. The goal for the schools is to provide adequate energy and nutrients, which to meet at least one third of RDA values. The below figures are demonstrating how much of essential vitamins and minerals were met with the recommended amount.

Figure 4.1 Median of micronutrients values in school lunches according to percent of target nutritive values (at BMA schools)

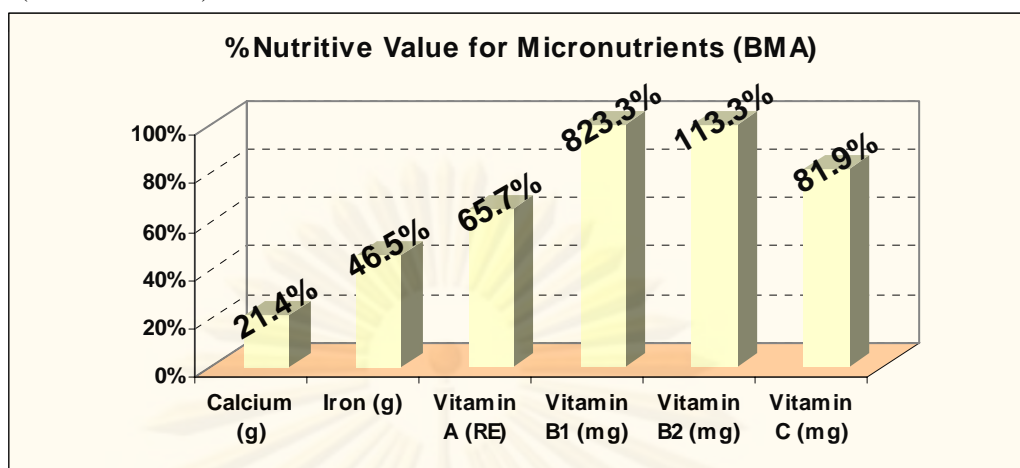
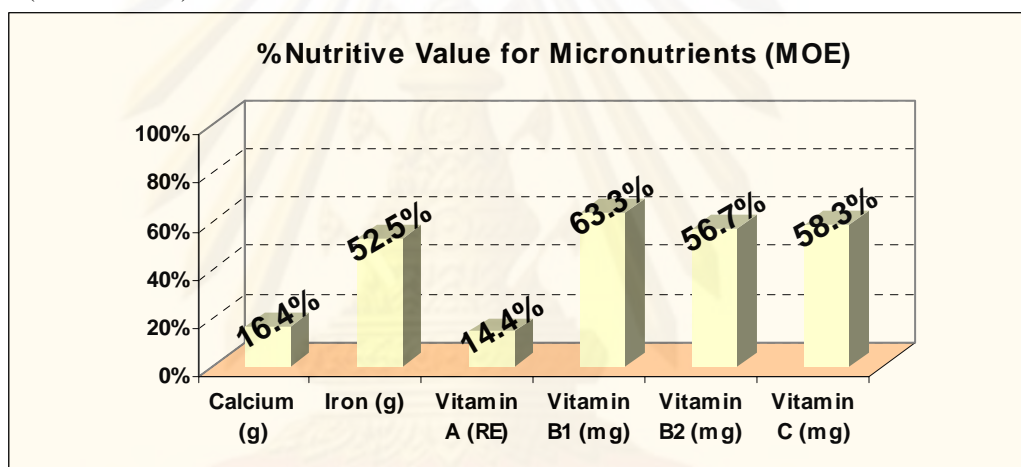


Figure 4.2 Median of micronutrients values in school lunches according to percent of target nutritive values (MOE schools)



It is clear that *BMA* provided more for the most of micronutrients than *MOE* schools. Especially, vitamin B₁ and B₂ were provided more than targeted values at *BMA* schools. In general, essential vitamins were provided in the lunch less at *MOE* schools. This may be reflecting to the variety of food composed in a meal and it is indicating that more fruit and vegetable are needed in order to increase the amount of these micronutrients. Calcium seems to be provided way less than recommended amount in both schools (21.4% at *BMA* schools: 16.4 % at *MOE* schools), however, all schools participated in the School Milk Program which provides students milk in the morning or in

the afternoon. Were milk included to count, the amount of calcium and vitamin could be result and be better than as they shown.

Students' Nutrition Status

All schools are required to submit the students' nutrition report each semester to the *MOPH*. For this study, the most recent reports were collected to identify students' nutritional status from weight-for-age and weight-for-height. The prevalence of obese/overweight and underweight are compared below:

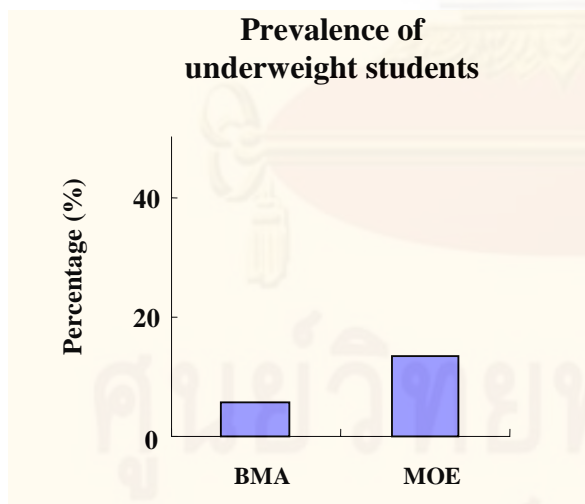
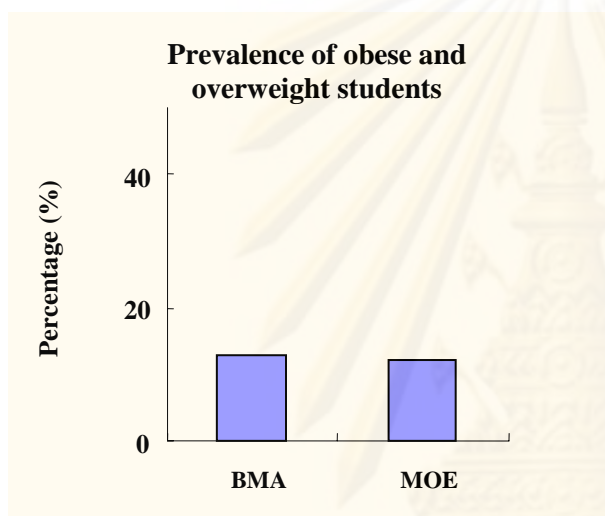


Figure5.1 Percentage prevalence of obese and overweight students at BMA and MOE

Figure5.2 Percentage prevalence of underweight students at BMA and MOE

The average of students identified as obese and overweight were 12.8% (*BMA*) and 12% (*MOE*) whereas underweight students were 5.8% in

BMA and 13.3% in *MOE* respectively. The finding suggests that there are more health disparities among students in *MOE* schools. Food is not the only fact to cause health inequality, yet it can affect in great deal. Some of underweight students at *MOE* schools can certainly be benefited through school meal programs. Thus, school lunch should be as healthy as possible to help students be well nourished.

Financial Management

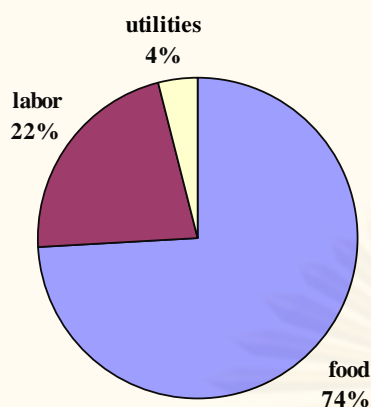
The information on budget and source of funding in each school were asked. All six schools receive 10 baht for every student for every school day from the School Lunch Fund. But it was obvious that *BMA* schools had more opportunities to receive extra support especially from *BMA* on constant basis because of the local government system. The common problem all schools faced was the delay of money arrival from the main funding source. In most *BMA* schools, budget is given each semester but is given by each year in some *MOE* schools. Therefore, if the school has less or not enough saving for *SLP*, this can affect directly to schools where lunches are prepared in their kitchens. The cost to prepare lunch at schools was asked in each school and the average amount spent for main purposes were determined and demonstrated below:

Figure 6.1 Distribution of cost at *BMA*

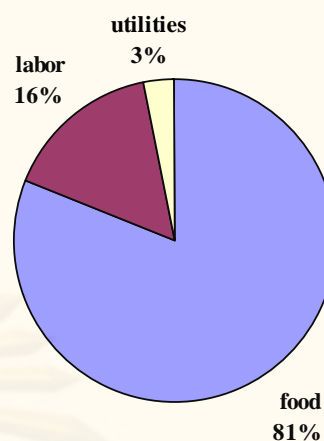
Figure 6.2 Distribution of cost at *MOE*

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Distribution of cost for school lunch at BMA schools



Distribution of cost for school lunch at MOE school



The most of money was spent for buying food in both types of schools. However, *BMA* schools seemed spent slightly less than *MOE* schools. The cost for man power includes salaries for cooks and food service staff, which ranged from 400 to 600 baht per person each day. The amount spent for utilities were almost the same indicating the cost were stable.

ศูนย์วิทยทรัพยากร

จุฬาลงกรณ์มหาวิทยาลัย

CHAPTER V

DISCUSSION, CONCLUSION, AND RECOMMENDATIONS

5.1 Discussion

The overall results suggest that the system management and practice of the *SLP* differs very much between the schools under *BMA* and *MOE*. The study also found that *BMA* schools provided better quality of school lunches when compared to *MOE* schools. The major difference noted between the two types of the school was the system of school lunch provision. Not all schools were managing the program well despite the funding and resources provided by the government. Several schools seemed facing some barriers to provide healthy nutritious meal. Actual practice of the program may not need be exactly the same in each school, yet there needs some practical policies to be implemented in both types of schools so that all schools can provide quality meals at minimum level.

Lack of regulation in *SLP* system

The way school lunch was provided to students differed between *BMA* and *MOE* schools. All *BMA* schools prepared lunch in the facilitated kitchen while all three *MOE* schools had different methods to provide school lunch. This may be due to the fact that *BMA* schools were given more resources by the local government. The practice manual for *SLP* was also developed by *BMA* and distributed in 2006 to improve the program among *BMA* schools. In contrast, not all were preparing lunch in the school kitchen in *MOE* schools because no standard *SLP* guidelines were available for schools to follow about

how to prepare lunch. As a result, some schools decided to provide through vendors from outside.

The study showed that when schools provided meals through vendors, schoolteachers tended to be less involved in managing and controlling of food safety and its quality. Some schoolteachers prefer this way because it requires less workload. This was especially true if food was prepared outside and brought to the schools only before serving. Schoolteachers did not check all the processes for cooking and food handlings if food was prepared outside. To ensure safe food handing, preparation of food within the school kitchens is preferred. Otherwise, there should be some guidance or regulations for schools if they decide to provide through vendors from outside. This could be achieved by requiring vendors to be involved in training process in much the same way that school lunch teachers attend the training program once a year.

Students' behaviors and available competitive foods

Competitive foods are food that is other than included in a school meal. Usually, competitive foods such as ice cream, potato chips, deep-fried snacks, and soda are sold as an extra at school canteen or vendors from outside. Most items can be purchased from 5 to 20 baht so students bring their own money if they want to buy.

Quite often, school-age children's diet behaviors can be affected by many factors. One of the most powerful factors can be their peer pressures. Eating the same foods as their peers can help them make more friends. If one buys snacks from canteen or vendors, snacks are generally shared with friends and children often do not resist when offered by friends. They may buy and eat for social reasons.

At most schools, directors or teachers mentioned that schools were controlling variation, its quality, and price of the competitive foods sold at canteen or by vendors. From the observation, though, their selling conditions seemed varied from school to school. Especially, schools under *MOE* tended to sell more items with less restriction compared to schools under *BMA*. At *MOE* schools, more deep-fried food such as French fries, sausages, and chicken wings were sold often and they seemed very popular among the students as it was observed some students preferred to eat those items more than given school lunch. In addition to this, sugar concentrated drink was available in some schools and many students were purchasing this drink instead of drinking water.



However, one of the schools under *BMA* was practicing very thoughtfully. This school separated the canteen area from the kitchen or places where students eat lunch so it is invisible for children while children eat lunch. In addition, a retired nutrition teacher was responsible for selling goodies at

this canteen so only selected items were sold. These resulted in schools to provide an ideal environment. Other schools, however, often sold extra food or snack where students could see while they were eating. Many children were attracted to these and some were hurried to finish the given lunch in order to buy food from vendors. Especially, when schools did not include any dessert or fruit items on their lunches, more students were interested in buying extra food.

Every school sold ice-cream and it was the most popular item among children at all schools. Some restrictions were identified in items sold. For instance, a school permitted to sell calcium rich and milk flavor ice-creams but restricted the sale of items with colored, high in sugar, and oversized. Yet, the detailed regulations were not standardized and the restrictions were different from school to school.

Seasonings and additional flavorings

As it is recommended, sugars and salt should not be provided in an excessive amount. In response to this, most schools did not place any condiments such as sugar or fish sauce on the table to be added by students. For some occasions depending on the menu, selected seasoning such as vinegar and chili powder were placed on the table. Also, all schools prepared meals for pre-school children separately with less spicy flavor. This was a great attempt that all should continue practicing, but variety of sweet sauces and toppings were made available to students at canteen or food vendors. Food sellers would give as students requested and some students were adding as much as they wanted. A schoolteacher stated that it is difficult to control sellers and vendors strictly because vendors would want to prepare food that students would buy. This

suggests a need to develop rules regarding range and portion of condiments which usually high in sugar and salt, particularly for food sold at schools canteens.

Students' participation in *SLP* and their competitive food intakes

At *BMA* schools, school lunches were provided to all students at free of charge and most of them ate at school. Especially, the schoolteachers stated they always try to encourage students to eat everything on the plate and they supervise all students during the lunch time. In fact, *BMA* schools were reinforcing students to participate *SLP* so their participation was always 100%. No students brought food from outside or from home.

On the other hand, *MOE* schools left more choices for children. Bringing food from home or outside was not prohibited in these schools so students' participation was not always 100%. A schoolteacher has admitted saying that there are about 5% of students who do not eat school lunch every day. In this school, some parents bring food for students at lunch time or students will buy food on the way to the school. When students buy food their own, they tend to buy what they like. Some students bought only deep fried chicken with an excessive amount and they ate nothing else. Schoolteachers did not seem to notice or encourage the student to eat healthy food instead. If the schools allow students to bring food from outside, there must be some restriction to limit or reduce some food item such as high in fat and sugar.

When some students at *MOE* schools were asked how often they eat school lunch, they answered they eat only twice or three times per week. They also said that they didn't like school meal because its taste and appearance were bad. Other student said "I just want to eat what I want" so she didn't eat

any vegetables on the plate. Few *MOE* schoolteachers actually stated that they cannot strictly prohibit from students eat other food than school lunch because parents would make complain. It is such a wasting of food and teachers' efforts if students do not eat school lunch. Students as well as their parents need to be motivated to participate in the *SLP* fondly. Promotion or activities could be organized through media and surrounded community because they might be more effective and powerful than schools act solely to convince parents sometimes. It is true as some schoolteacher commented by saying that "schools cannot do everything" and hence, multi-sectoral involvement is strongly needed for promotion and implementation of effective *SLP*.

Available Nutrition Information

Most schools displayed some information regarding health. All schools placed poster or sticker with a message of "washing hands" around the sink and bathrooms. But, only few schools displayed information about food or healthy eating. Only one *BMA* school had a poster of "Thai Nutrition Flag" and very few had information about food groups. All schools seemed to have more on information regarding sanitation or food contamination but nutritional information were somehow limited.

At *BMA* schools where much information about nutrition were available, weekly lunch menus were written on the board in the dining hall or kitchen area so students could see what they were eating. One school even gave information on nutritional value for each menu and this could be very ideal for all schools to practice as well. Students may be not familiar with nutritional information at the beginning, but their understanding and interest

may grow as they see them everyday for long term. Therefore, displaying of information is very important and it should be reinforced at each institution.

Some schools prepared and organized their information very well even for the visitors from outside. Pictures of their cooking activities were displayed in creative ways and related data was filed chronologically. But, this type of management was an exceptional and was only appeared at schools where schoolteachers were committed and taking actions actively for *SLP*. Schools like this should be acknowledged by other schools, public, and local community. Also, sharing of their information and suggestions can be useful for other schools as well.

Nutrition Education Program

Most school directors and schoolteachers stated that schools give a small talk about health related issues during the morning assembly at least once a week. Food and nutrition information was not always included but discussed on regular basis, they added. For schools to spend more time on nutrition education seemed to be depending on the degree of school directors' intentions to value it as a part of curriculum. If a director focuses on other issue more importantly, it is less likely for the school to offer sufficient nutrition education. In fact, a *MOE* school would invite nursing students from nursing college near by to give special lecture related to health every month but nutrition would be just a part of it and no other opportunity to learn about healthy eating was given to students. Cooking class once in a while was a common way to introduce some food and knowledge about nutrition but this seemed to be considered as an extra-curricular program rather than a main part of curriculum.

Schoolteacher's communication and participation

At some schools, teachers' tables were located near the students' seat so that they could supervise them during the lunch. This also allowed schoolteachers to motivate some students who disliked the school lunch. Schoolteachers also would have more opportunities to talk with other teachers if they eat together. A better communication is a key to operate the program successfully and increase productivities. For this, informal conversations are as important as formal meeting or discussion between teachers. This can then lead to active involvement of them in all school activities

The quality of school lunch varies greatly depending on who is in charge. It is also important to notice that the schoolteachers' efforts and their will to participate do reflect on the performance of the program. The better managed schools were where schoolteachers often had meeting about school activities including *SLP*. Working for the program by alone or limited number of teachers does not bring the best result due to the capacity of existing problems. The more teachers cooperate together, the better management which also helps with providing the quality lunch.

Lack of parental and community involvement

None of the schools under *MOE* or *BMA* specified any active involvement of parents or the community members. Some schools responded that parents would join for lunch when they had special event at schools, but they were not involving any process of management or planning phase. Some parents tended to be involved as the schools hired them as food service staff; however this did not mean that all parents would be involved in the program. A *MOE* school seemed to put more focus on providing special class such as Thai traditional

art and music. Here, parents were willing to pay for any additional fees for the special classes, but not for any additional fee for school lunch. Support from the community members was also very limited in almost every school. Some schools were getting help from the temple, but management of *SLP* was maintained by schools only.

To make students' environment healthy, parents and community involvement are necessary so more parents and members from the community should be motivated to be involved. The previous study at Khon Kaen province found that more communities in suburban than urban area participated in *SLP*. (Banchonhattakit, Nathapinthu, Sota, & Polbunta, 2000) This suggests that schools in suburban area may be a starting point to implement some projects to increase parental and community involvement towards *SLP*. Again, convincing some parents and community members may be the most challenging, but it is an important key to success in creating healthy environment for school children. Inter and intra sectoral collaboration activities are needed urgently and an increase in parental and community participation is expected in future.

The possibilities to minimize the cost

Most schools spend large amount of money to purchase food to prepare school lunch. Recently, more schools were likely to struggle with an increase of food price. This was causing schools to provide limited selection of menus sometimes. However, its cost can be minimized if food is purchased in bulk with large amount. Thus, purchasing food with several schools together may be able to reduce the food price and it is recommended to schools where schoolteachers go and buy at the local market everyday.

School gardening can be another way to reduce some cost and it is regaining more attentions these days. In California, a pilot project has implemented to practice and create a more sustainable environment so the school is raising and using locally grown organic products for school lunch. The students will take care of them from seeding to cooking. This is not new in Thailand because more schools in remote area are often facilitated with school gardening programs. However, much of limitations apply to the schools in Bangkok. Most schools had some kind of small garden, but they were not really used to grow any vegetables to be eaten. Moreover, schools located in urban area, the area available for gardening was appeared to be limited. Though having school garden to raise edible fruit and vegetable for school meal is a desired application, to embark this in all institutions in urban schools maybe not practical at this time.

The other possibilities greatly rely on the local community around the schools. Bangkok has much less agricultural field than other provinces, so donation of fresh produces can be expected less from farmers or individuals. Instead, there are many organizations and private companies where schools may ask for some help. Few schools were receiving food and materials needed for *SLP* from hotel, restaurants, and a gas company. Other schools may also seek some help from the local stores if they cannot get enough support from the government and parents.

5.2 Conclusion

The School Lunch Program has been implemented in Thailand for more than 30 years. It has been effective to improve children's health and nutritional status in someway

but the current practices do not provide quality lunch to children in every school. The situations and environment are quite different in public schools under *BMA* and *MOE*.

Especially urban city like Bangkok, people's social economic status range widely and it is remaining as a problem to create unequal environment for school-age children. But, public schools are one of the few sources where opportunities should be equally provided to every child. School meal service is a great tool to ensure children's health and growth. Thus the quality of school lunch should be maintained well and controlled at each institution. With all this in mind, this study found several important facts regarding the current *SLP* practices among some public primary schools in Bangkok.

A comparison of *SLP* processes revealed that the management and system of school lunch provisions were especially different between schools under *BMA* and *MOE*. All *BMA* schools prepared and provided lunch from school kitchen while each *MOE* school had different approaches to provide school lunches. One main reason of this incompatible system perhaps could be the lack of reinforcement and policy implementation among *MOE* schools. When schools had no guidelines to follow or no policy was fully understood, contents of the *SLP* were more likely to be inconsistent as it was shown at the *MOE* schools. A weakness in policy implementation also resulted in the total management and quality of *SLP* to be poorer with less cohesion or commitment of school directors and teachers.

The result also showed that not all school lunches met the nutritional standard of energy and nutrients. In both type of schools, fruit and vegetable were offered remarkably less than recommended amount. This may be an important part to be improved as both fruit and vegetable intake are strongly recommended to reduce the risk of chronic non-communicable disease. (MOPH, 2001) The recent national survey

also reported that 12.5% of children age between 6 and 14 consumed fruit and vegetable less than two days a week. (NSO, 2005) This indicates the need of strong encouragement to increase the consumption of this particular food group. Since plenty of fruits are available through out year in Thailand, more fruits should be able to provide as a part of school meal.

Common problems both schools encountered were the lack of support from parents and the local community, an increase of food price, and school children's eating behaviors. However, *SLP* seemed to be more adopted among *BMA* schools and it is more effectively managed to provide quality meal when compared with *MOE* schools.

Despite the fact that current *SLP* can provide free lunch to more number of students in public primary schools than previous time, there still exist some difficulties to improve the quality of school meal. There could be different methods of services to provide quality lunch, but its contents should be standardized at minimum level to guarantee the *SLP* would be beneficial to all children. More supports are needed from multiple sectors and further study is needed to identify the practical steps to improve the *SLP* especially in *MOE* schools.

5.3 Limitations of the study

Since there are 400 and more public primary schools in Bangkok, these results are representing only a small part of all. More qualitative information is needed from other schools, parents, and students to really understand the current situation in Bangkok.

Assumptions and estimations were made for calculating energy and nutrients amount in each menu because recipes were not available or not used at every school. When cooks were asked whether they use any recipe or not, they answered that the

recipes usually came from their head and most of the ingredients were measured using their eye-scale. They said they “just know” and recipes would be meaningless when they became busy. In addition, some energy and nutrients could be lost during the cooking process, therefore, energy and nutrients in real amount could be slightly more or less.

Further study is needed in other *MOE* schools to unveil their current *SLP* practices. Unlike schools under *BMA*, some schools may be facing other difficulties providing quality school lunch. Effective monitoring and evaluation system are urgently needed especially schools under *MOE*.

5.4 Recommendations

For the general public schools to provide quality lunch, the guideline or policy must be placed at minimum level. This includes establishing a strong system of all process from planning until monitoring. If a school chooses to provide school meal through tertiary provider, there also should be guideline or restriction for providers to follow. The school lunch teachers should be involved in the process for developing practical guidelines.

In addition, nutritional contents of the lunch should be reconsidered and monitored by professionals on constant base. Now that students eat lesser portions of vegetable and fruit, providing menus including these food groups should be greatly promoted. Several vegetables can be added to students’ favorite menu sometimes. For instance, carrots or celery can be easily added to the chicken broth which usually served with chicken and rice dish. Ideas of creating unique recipes are needed from both schoolteachers and professionals.

Active participation of school directors and schoolteachers is also required. Their commitment and efforts to participate into the program are keys for successful

implementation. Training and workshop should be provided consistently to all school lunch teachers to help them plan menu with well balanced food. Further, related information should be provided to school directors and other schoolteachers as well to increase awareness and understanding of the *SLP* significance and principles, especially among *MOE* schools. An updated handbook for *SLP*, “Nutrition Flag” posters, and related materials should be distributed equally to all schools.

Networking with other schools is strongly encouraged in both *BMA* and *MOE* schools. If one school is well in managing the budget, the responsible teacher in this school can act as a mentor for the other schools. Sharing information and working with other schools will be the best way to solve similar problems they face, and to motivate each other for active involvement.

As some of school lunch teacher mentioned, current budget from the central government (10 baht per head for every school day) may not be enough to provide completed healthy lunch for all. Especially with the recent global increase of food and oil price, many schools are facing difficulties managing their limited budget. If an extra few baht can be added on to 10 baht, schools may be able to purchase some fruits more often for students. Adding some fruits can be one of the best options to increase the provision of energy and essential vitamins. This may also help prevent students buying competitive foods from vendors outside.

Lastly, the program should be monitored by experts from time to time. It is important to inspect food contamination and its safety, but the process and management of the *SLP* also need to be evaluated in order to ensure its quality. One single agency should be responsible for monitoring of the program in all schools instead of having several different agencies come and go for a specific evaluation each time.

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