



A COMPARATIVE STUDY OF SCHOOL LUNCH PROJECTS BETWEEN
THAILAND AND JAPAN



TAKUNORI KOBAYASHI

A Thesis Submitted to the Graduate School of Naresuan University
in Partial Fulfillment of the Requirements
for the Master of Education in Development Education

2023

Copyright by Naresuan University

A COMPARATIVE STUDY OF SCHOOL LUNCH PROJECTS BETWEEN
THAILAND AND JAPAN



A Thesis Submitted to the Graduate School of Naresuan University
in Partial Fulfillment of the Requirements
for the Master of Education in Development Education
2023

Copyright by Naresuan University

Thesis entitled "A COMPARATIVE STUDY OF SCHOOL LUNCH PROJECTS
BETWEEN THAILAND AND JAPAN"

By Takunori Kobayashi

has been approved by the Graduate School as partial fulfillment of the requirements
for the Master of Education in Development Education of Naresuan University

Oral Defense Committee

..... Chair
(Associate Professor Panuwat Pakdeewong, Ph.D.)

..... Advisor
(Associate Professor Thak Udomrat, Ph.D.)

..... Co Advisor
(Associate Professor Varinthorn Boonying, Ph.D.)

..... External Examiner
(Associate Professor Jitima Wannasri, Ph.D.)

Approved

.....
(Associate Professor Krongkarn Chootip, Ph.D.)
Dean of the Graduate School

Title A COMPARATIVE STUDY OF SCHOOL LUNCH PROJECTS BETWEEN THAILAND AND JAPAN

Author Takunori Kobayashi

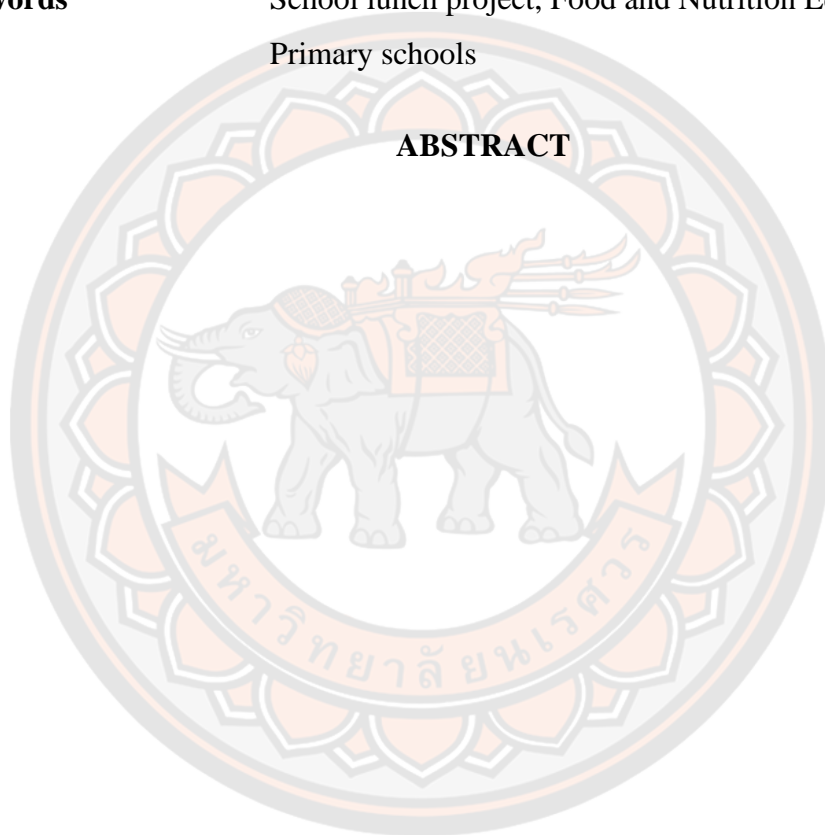
Advisor Associate Professor Thak Udomrat, Ph.D.

Co-Advisor Associate Professor Varinthorn Boonying, Ph.D.

Academic Paper M.Ed. Thesis in Development Education, Naresuan University, 2023

Keywords School lunch project, Food and Nutrition Education, Primary schools

ABSTRACT



ACKNOWLEDGEMENTS

I would like to say thank you to my advisors Assistant Professor Thak Udomrat, who teaches me a base of education, Associate Professor Varinthorn Boonying, who supports my studying, data acquisition, and comparative education, Associate Professor Jitima Wannasri, who has deep knowledge, various experiences, and human relations, Associate Professor Panuwat Pakdeewong, who gives me advices as Chair. Thanks to their kind and generous support, I could write a research proposal.

I'm also grateful to Associate Professor Krongkarn Chootip, who is the Dean of the Graduate School. Thanks to their help I can continue my teaching experience.

I also say thank you to the three principals of three primary schools in Phitsanulok Province. The schools are Ban Krang School, Ban Nong Prue School, Wat Senat School. Their warm understanding and cooperation enabled me to continue study.

This thesis couldn't be written without the understanding and cooperation of them and everyone. Thank you, sir and ma'am. Have a nice day.

Takunori Kobayashi



TABLE OF CONTENTS

	Page
ABSTRACT.....	C
ACKNOWLEDGEMENTS.....	D
TABLE OF CONTENTS.....	E
LIST OF TABLES.....	G
LIST OF FIGURES.....	H
INTRODUCTION.....	1
1. Rationale of the Study.....	1
2. Research Questions.....	3
3. Objectives of the Study.....	4
4. Scope of the Study.....	4
5. Expected Outcomes of the Study.....	5
6. Definition of Terms.....	5
CHAPTER TWO.....	7
REVIEW OF RELATED LITERATURE.....	7
1. Healthy Meals in School are Critical to Students.....	7
2. Human Health and UN Development Goal to End Hunger.....	7
3. The Emergence and Development of School Lunch Project in Thailand.....	8
4. Current States of Food Education and School Lunch Projects in Thailand.....	11
5. School Lunch Project in Japan in the Early Period.....	13
6. The Development of Food and Nutrition Education (Shokuiku) in Japan.....	16
7. Important Statistics Related to Food and Nutrition Education in Japan.....	20
7.1 About Rice-Based School Lunch.....	20
7.2. Qualified Nutritional Teachers in Primary Schools.....	20
8. The Administrative System of Food and Nutrition Education in Japan.....	20
9. Advantages of Comparative Education Studies.....	21

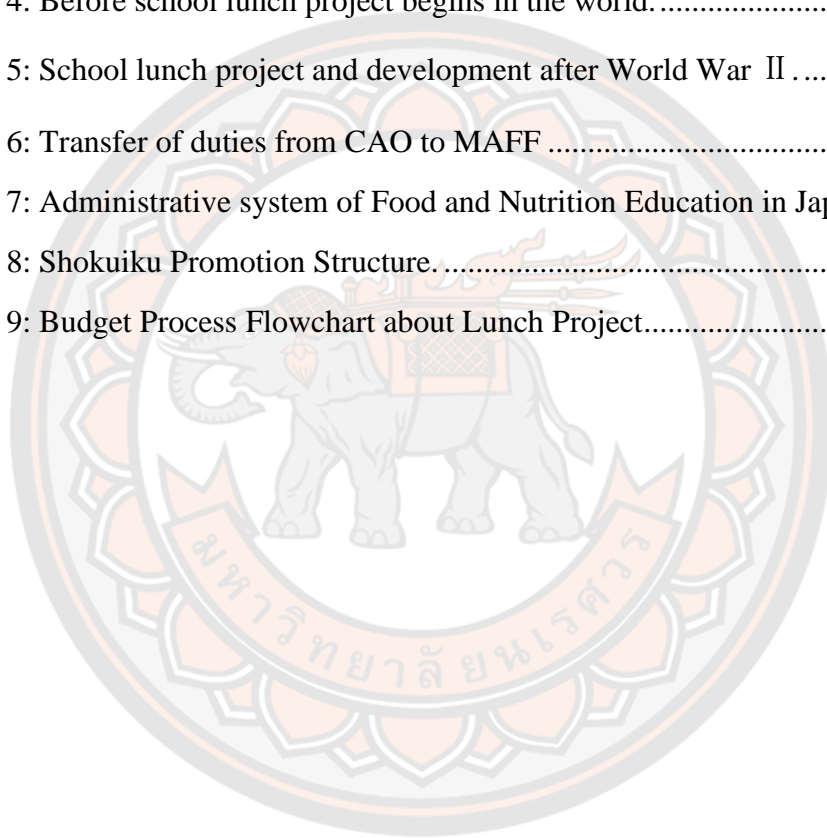
10. Primary Schools in Phitsanulok Province and the School Lunch Movement ...	22
10.1 The Administration of Primary Schools in Phitsanulok Province	22
10.2 The School Lunch Movement	22
10.3 Some Administrative Problems in School Lunch Projects of Phitsanulok	23
10.4 Research-related risk of epigenetic influence	24
10.5 Research Conceptual Framework.....	25
CHAPTER THREE	29
RESEARCH METHODOLOGY.....	29
Part 1: To Study the School Lunch Project between Thailand and Japan.	29
Part 2: To comparative study and survey in school lunch projects in Phitsanulok. 30	
Part 3: Details of the research to study school lunch project.....	31
CHAPTER FOUR.....	33
RESEARCH RESULT.....	33
Part I: The Analysis of Historical Development of Food and Nutrition Education 33	
in Primary Schools of Japan and Thailand	33
Part 2: An Analysis of the Data from Survey Research	48
CHAPTER FIVE	59
CONCLUSION, DISCUSSION AND SUGGESTION	59
1. Conclusion	59
2. Discussion.....	66
3. Suggestion.....	67
APPENDICES	70
BIBLIOGRAPHY	93
REFERENCES	97
BIOGRAPHY	98
REFERENCES	6
BIOGRAPHY	8

LIST OF TABLES

	Page
Table 1: Details of Principals selected from Phitsanulok province	31
Table 2: A Comparison of the Forces and Factors Responsible for Objectives of Food and Nutrition Education in Japan and Thailand.....	43
Table 3 A Comparison of the Inputs Affect Shokuiku in Japan and the Inputs Affect Food Education in Thailand.....	47
Table 4 A Comparison of the process Affects Shokuiku in Japan and the process Affects Food Education in Thailand.....	48
Table 5 The learning contents and actual practices of Food Education in School No.1	49
Table 6 The Managerial Process of School Lunch Project at School No.1	50
Table 7 The learning contents and actual practices of Food Education in School No.2	52
Table 8 The Managerial Process of School Lunch Project at School No.2.....	53
Table 9: The learning contents and actual practices of Food Education in School No.3	55
Table 10 The Managerial Process of School lunch project at School No.3	56

LIST OF FIGURES

	Page
Figure 1: Research Conceptual Framework (1)	25
Figure 2: Research Conceptual Framework (2)	26
Figure 3: Research Conceptual Framework (3)	27
Figure 4: Before school lunch project begins in the world.....	28
Figure 5: School lunch project and development after World War II	28
Figure 6: Transfer of duties from CAO to MAFF	44
Figure 7: Administrative system of Food and Nutrition Education in Japan	45
Figure 8: Shokuiku Promotion Structure.....	61
Figure 9: Budget Process Flowchart about Lunch Project.....	65



INTRODUCTION

1. Rationale of the Study

UN (n.d.a) set the 17 Sustainable Development Goals, Goal No.2 of which is to create a world free of hunger by 2030. Between 720-811 million people were suffering from hunger in 2020, with 2.4 billion people in food insecurity. This number of people is increasing by approximately 320 million people every year.

According to UNICEF (2020), an estimated 350.6 million people are undernourished in Asia and the Pacific, which is 51% of the global total of 687.8 million in the Asia-Pacific region, food insecurity is the most serious in Southern Asia.

After the promulgation of the Compulsory School Law of B.E.2545 (CE 2002), primary school education in Thailand became compulsory for all children aged 6 years and over (Phitsanulok Primary Educational Service Area Office 1, 2018).

In Japan, primary education became compulsory in 1886 during the Meiji Era. Primary education in both Japan and Thailand is 6 years, which is followed by 3 years of compulsory lower-secondary education. Primary school lunch projects in Japan have been placed since the end of the 19th Century as food service for poor children in Japan. After World War II, bread and skim milk became officially provided under the Aid from Government Appropriation for Relief in Occupied Areas Fund (GARIOA).

In 1948, the school lunch project in Japan became an integral part of the primary school curriculum, to help students understand what constitutes a nutritionally balanced meal while learning the fundamentals of proper eating and table manners. There are four types of special classroom activities such as (i) classroom activity, (ii) student council activity, (iii) club activity, and (iv) school event activity. The School lunch project is defined as a classroom activity but is held during the school lunch hour, not during normal class hours. The class teacher teaches knowledge of nutrition, proper eating and table manners (MEXT, 2017). Since 2005, "Food and Nutrition Education" or "Shokuiku" has officially been integrated into the school lunch project. In 2012, the handbook titled "A Guide to Shokuiku" was distributed to schools (MAFF, 2012). Food and Nutrition Education in Japan has

resulted in children learning good food habits, such as eating balanced meals (Barilla Food Center for Nutrition Foundation, 2017).

School lunch projects in Thailand began without general support but were recently developed as a significant campaign of the government to honor the late King Rama 9's 60th anniversary in 1987. Budget support began for the provision of school lunches in all primary schools. According to Jumpatong (2007), food insecurity relates to children's cognitive function, weight, social skills. The School lunch projects is intended to overcome malnutrition in students from poor backgrounds as well as teach dietary habits, agricultural activities, social values and manners. It has proved helpful in improving school attendance in rural areas.

Chavasit et al. (2013) and Loysongkroa. et al. (2014) have stated Thailand has successfully controlled malnutrition problems, undernutrition, and overnutrition. However, nutrition-related diseases remain problematic, keeping the costs of health care high. Food labelling standards also are still not universally applied. The National Plan of Action for Food and Nutrition started in Thailand in 1977 (Siong. et al., 2020). and nutrition education is now conducted at all education levels from kindergarten through university. The Food education program stated in the Thailand National Plan is also followed in other ASEAN countries. The Ministry of Public Health is one of the ministries are in charge of the promotion of nutrition for students.

Inoue (2011) described Basic Act on Food, Agriculture and Rural Areas in 1999, the Japanese Dietary Guideline of 2000, the Policy to revive food and agricultural production in 2002, and Basic Act for Food and Nutrition Education in 2005. The policies in these various Acts and Policy pronouncements encourage an understanding of agricultural activities and food self-sufficiency by consumers and within the agricultural sector. Sato (2015) discussed the destruction of traditional Japanese dietary habits by the newly experienced prevalence of Western dietary behaviours which changed food consumption practices in Japan. There is a risk of promoting meaningless Westernizing in Japan. It was this move away from traditional dietary habits which was the target of the school lunch projects, particularly the food and nutrition education aspects of the projects.

Popkin (2006) suggested the five stages of nutrition transition. It explained the relationship between global energy imbalances and related diseases. According to

Nomura et al. (2022), Nutrition transition has been increasing in the world since the 1980s. Nutrition transition means westernized diet which high fat, high carbohydrate, low dietary fiber food intakes increase and physical activity decreases. It's the phenomenon of changing body composition in a group. Nutrition transition, the Double burden of malnutrition and Double-duty actions are the topic of WHO policy paper in 2016 (WHO, 2016) and featured in the Lancet in 2019 (Hawkes et al., 2020).

UN (n.d.b) projected world population will reach 10 billion around 2050 and focuses on just eight countries which increase population between 2022-2050 in global population are as follows the Democratic Republic of the Congo, Egypt, Ethiopia, India, Nigeria, Pakistan, the Philippines, and the United Republic of Tanzania. According to the five stages of Nutrition transition, those countries will increase the double burden of malnutrition problems.

Comparative education provides a reference for reforms, and through studying the educational systems of other countries we can discover which reforms are possible and desirable. Therefore, this research would like to explore the historical development of Food and Nutrition Education in primary schools of Japan in comparison to that of Thailand. And, to know more about the actual conditions in primary schools of Thailand, a survey of Food and Nutrition Education in school lunch projects of primary schools in Phitsanulok Province also be explored. Through the study of school lunch projects, it's expected a better understanding of the School lunch project with Food and Nutrition Education in two different countries, and the knowledge should benefit educational policy makers of both countries and should provide background knowledge for other educators in general.

2. Research Questions

- 2.1** How have Japan and Thailand historically developed school lunch projects from the past to present? And, if we focus on Food and Nutrition Education in school lunch projects of primary schools; such as its objectives, the administrative systems, inputs, processes, and the outcomes, etc., what are the similarities and differences?
- 2.2** What are the actual conditions, successes, failures, and causal factors of the successes or failures of school lunch projects which

focused on the rural primary schools in Phitsanulok Province? And, according to the viewpoints of school administrators and teachers of rural schools in Phitsanulok, how possible does it apply Japanese concepts of Food and Nutrition Education?

3. Objectives of the Study

- 3.1** To explore and compare the historical development of school lunch projects in primary schools in Japan and Thailand as related to Food and Nutrition Education.
- 3.2** To explore the actual situations of Food and Nutrition Education in school lunch projects in primary schools in Phitsanulok Province.

4. Scope of the Study

Qualitative methods will be used as explained below:

- 4.1** A documentary analysis of previous studies will be descriptively conducted. Then, a comparison of major concepts for Food and Nutrition Education in school lunch projects of primary schools in Japan and Thailand will be made. Finally, the objectives, administrative systems, inputs, processes, and the outcomes of Food and Nutrition Education in school lunch projects in the two countries, nowadays, will be summarized in flow charts.
- 4.2** A survey of actual conditions of Food and Nutrition Education will be made by means of interviewing school principals and teachers, observing school lunch provisions and activities, and analyzing the documents related to appropriately selected rural schools of Phitsanulok Province, Thailand.

5. Expected Outcomes of the Study

- 5.1 The historical developments of Food and Nutrition Education in school lunch projects in two important educational systems of Asia will be further acknowledged.
- 5.2 The data collected from selected rural schools in Phitsanulok Province will reflect the actual conditions, successes and failures, and the possibility of applying the Japanese concepts of Food and Nutrition Education in school lunch projects to all other rural schools in Thailand.

6. Definition of Terms

- 6.1 **School lunch project** means the project which a school provides an appropriate eating meal for its school children, mandated intentionally by the authority so that students and other may have nutritious food, good knowledge about food, how to produce good food, and support from the government.
- 6.2 **Primary School** means the lower part of compulsory education in Thailand and Japan. In these two countries, every child, aged 6 to 12 years old, is obliged to attend primary schooling, before further proceeding to a lower secondary school which is also compulsory. There are 3 education areas in Phitsanulok. The number of public primary schools is 399, teachers and education personnel of public school is 4,813 in Phitsanulok province.
- 6.3 **Emergence of School lunch projects** means beginning of school lunch in primary school. Thailand began it in 1952, Japan in 1889.
- 6.4 **School lunch projects after World War II to Early 21st Century** means expansion of school lunch projects. Simply, Thailand focuses on increasing budgetary support and food provision. Japan focuses on enrichment of educational support.
- 6.5 **Food and Nutrition Education in School Lunch** is the most important base of education to ensure physical and mental health for all citizens. It's called Shokuiku in Japanese.

- 6.6 A Comparison of the historical Development of Food and Nutrition Education in School lunch projects** shows difference in establishing policy and policy development of Food and Nutrition Education with Thailand and Japan.
- 6.7 Analysis of Forces and Factors Responsible for The Differences** means analysis of the forces and factors responsible for the differences in objectives, administrative systems, and inputs and management processes in School Lunch Projects and Food and Nutrition Education with Thailand and Japan.



CHAPTER TWO

REVIEW OF RELATED LITERATURE

1. Healthy Meals in School are Critical to Students

Kristin Groos Richmond and Cynthia Muller agreed children who lack access to healthy food options at home and in schools have a more difficult time learning, and they are more likely to have trouble focusing, exhibit behavioural problems, and struggle academically (The T74 Newsletter, 2020).

Harding Senior High School in St. Paul, Minnesota, is known as a 90-90-90 school where: 90 percent of students are minorities, nearly 90 percent come from poor or struggling families, and 90 percent graduate to go on to college or a career. The most amazing about this school is which it recognizes and acts on the critical contribution which adequate food and good nutrition make to academic success. It provides three balanced meals a day to all its students. For those who can't get to school in time for early breakfast, a substitute meal is offered after the first period, to be eaten during the second period. Every student can pick up dinner at the end of the school day, and those who play sports after school can take the dinner with them to practices and games. The school meal program is to make sure the students are well fed to their ability to succeed academically, well known by the many studies showing which children who are hungry or malnourished have a hard time learning (Rogers, 2017).

2. Human Health and UN Development Goal to End Hunger

Auxology is a multi-disciplinary science involving anatomy, anthropology, education, zoology, pediatrics, etc. The School Lunch Projects are related to school health and safety from view of Auxology. The Japanese Association for Human Auxology publishes the reference data of children in Japan. (The Japanese Association for Human Auxology, n.d.)

Goals No.2 and 3 of the United Nations Sustainable Development Goals (SDGs) are targeting zero hunger, and, good health and well-being are to be achieved in the Year 2030, while Goal No. 4 focuses on quality education. Prior to SDGs, the

Millennium Development Goals (MDGs) call for the reduction of poverty with hunger in Goal No.1, and universal primary education in Goal No.2.

Therefore, it is urgently needed to feed children who are suffering and having poor health with nutritious meals to solve malnutrition and eradicate hunger and health problems. The vision of WFS (World Food Summit) covers five steps to zero hunger:

- 1) put the furthest behind first - social protection schemes for the poorest 2 billion people, and to support from demand side;
- 2) pave the road from farm to market - access to affordable, nutritious food for everyone (7 billion people);
- 3) reduce food waste - lost/wasted food costing \$1 trillion annually should be reduced;
- 4) encourage a sustainable variety of crops - four crops (rice, wheat, corn and soy) are 60% of all calories consumed, thus. more diverse range of crops is encouraged with challenges of climate changes; and
- 5) make nutrition a priority, starting with a child's first 1000 days - good health and nutrition for a child, particularly in the first 1000 days (Age 0-2).

3. The Emergence and Development of School Lunch Project in Thailand

The school lunch project in Thailand has been supported by law since 1992 (B.E.2535). Previously, in 1982, the Office of National Primary Education Commission (ONPEC) initiated the campaign under the slogan “For Hungry Brothers and Sisters” (แด่น้องผู้หิวโหย) so that school lunch projects were launched in all primary schools under its jurisdiction before the King's Birthday on December 5, 1987 (School lunch project Fund Bureau, n.d.a).

The Act for School Lunch Project Fund for Primary Schools (พระราชบัญญัติกองทุนเพื่อโครงการอาหารกลางวัน ในโรงเรียนประถมศึกษา พ.ศ.2535) was enacted on 9 April 1992. Therefore, the government funding of at least 500 million Baht per year until the basement fund would reach 6,000 million Baht was started. According to the

legislative provision, the benefits from this fund would be used for school lunches in primary schools of all types (Ibid., Singsatit, 2012).

In 1999, on October 19, the Cabinet Decision was launched so that the Ministry of Education would cooperate with the Ministry of Agriculture and Cooperation, with support from the Ministry of Interior, the Ministry of Public Health, and all other ministries, to promote school lunch projects so that all students are universally served with lunches (Ibid).

Furthermore, since fiscal year 2001, the government budget for school lunch subsidy has been transferred from the Ministry of Education to the Ministry of Interior which is responsible for the administration of public schools under local administrative organizations. Thus, the Department of Local Administration Promotion (กรมส่งเสริมการปกครองท้องถิ่น) in the Ministry of Interior is now responsible for managing school lunch project budget of Thailand since fiscal year 2003. (Ibid.)

The objectives of School Lunch Project Fund Bureau are as follows. (Ibid.)

1. To enable physical development of students so that they become healthy and have the standard weights and heights in accordance with the criteria set by the Hygiene Bureau and the Ministry of Education.
2. To enable the school management so that all children are served with school lunches which are integrated with agricultural products.
3. To support school children so that they have active learning experiences from the school lunch projects which create lunch products.
4. To provide for sufficient amount and good nutritional quality school lunches.

Under Articles 11 and 12 of the Act for School Lunch Project Fund for Primary Schools, the School Lunch Project Fund Committee has been appointed. The committee is composed of the general secretaries from 3 ministries (Ministry of Education, Ministry of Finance, Ministry of Public Health); the general director of National Budget Bureau; the head of Community Development Department; the head of National Accounting Department; the commander of Patrol Police; the general secretary of Bangkok Metropolitan; the general director of Private Education Commission; and 4 experts. In addition, the general director of the Office of Basic

Education Commission is a member and secretary of the committee. Their major roles are to set up criteria and guidelines for school lunch projects; allocate subsidies; cooperate with other public and private agencies; publicize school lunch projects; monitor and evaluate school lunch projects; enact related regulations and bylaws; and appoint sub-committees if required (School lunch project Fund Bureau, n.d.b).

In 2008, the Act for National Food Committee was enacted on January 31. The Act states in Article 3 which “Food Education” is “the processes which promote, develop and research to acknowledge and provide for realization and correct behaviours about food chain and food consumption.”

The School Lunch Project Fund Bureau states 10 measures are implemented, to comply with the policies of related ministries, at present (School lunch project Fund Bureau, n.d.c).

1. To promote good meals for school children so that they have lunches with high quality, as related to hygiene, nutrition, and life safety;
2. To keep the correct up-to-date data for effective planning of the school lunch project;
3. To enable the prevention and solving of mal-nutritional problems among school children, as aimed by the Hygiene Department;
4. To promote a variety of active learning experiences which can be integrated in the school lunch project;
5. To promote school-based physical exercises, as a service for school children and community people;
6. To promote and develop healthy habits of school children in accordance with the National Healthy Codes
7. To systematically and continuously promote supports from various partners to cooperatively manage the school lunch project;
8. To encourage schools, through a campaign, so that they use the program called “Thai School Lunch” for their school lunch projects;
9. To publicize the results of school lunch project in primary schools;
10. To implement the Philosophy of Sufficiency Economy in the school lunch project of primary schools, gearing towards the sustainable development.

The National Healthy Codes was announced on 28 May 1996, following the Cabinet Decision at that time. There are 10 codes to be practiced by all children, youth, and people in Thailand:

1. Keep body, clothes and utensils clean;
2. Take care of healthy teeth, brush them daily and correctly;
3. Wash your hands before eating and after going to toilet;
4. Eat cooked and clean food, avoid dangerous mixtures or tasty and colorful food;
5. Refrain from smoking, alcoholic drink, drugs, gambling, and sexual swinging;
6. Build up warm relationship within the family;
7. Always be cautious to prevent disasters;
8. Do physical exercises regularly, and check up your health annually;
9. Always enjoy yourself and be in good mood;
10. Have civic-mindedness and engaged in creating public service.

4. Current States of Food Education and School Lunch Projects in Thailand

After the enactment of the National Food Committee in 2008, the School Lunch Project Fund Bureau was established following the suggestion by the School Lunch Project Fund Committee.

Singsatit (2012), in “Factors Affecting the Implementation of School Lunch A Case Study of Samutprakarn Primary Education Service Area 1.” Master Thesis. M.P.A. (Public Policy). Bangkok: Srinakarinwirit University, found in the years 1992-1998, the provision of school lunch budget for primary students was 5 Baht per head per one day, 200 days per year. In 1999, the subsidy was increased to 6 Baht per head per day. But, for fiscal year 2023, it has been increased to 22 Baht per head (OBEC, 2022; Petchoo et al., 2022).

According to Singsatit (2012), the Ministry of Education stated seven objectives of the school lunch project in primary schools in 2003;

1. To provide enough nutrition to the children with under-nutritious problems;

2. To manage food service to all children so that they equally receive nutritious lunches;
3. To inspect food quality so that primary school children have nutritious and clean food for lunch;
4. To integrate any learning activities from various learning areas of the national primary education curriculum which are linked with the school lunch project;
5. To manage other activities which support the budget, the materials, and the labor force for school lunch projects, such as the Project to produce School Lunch Products, the Agricultural Project for School Lunch project, and so on;
6. To coordinate with any other government organizations are able to provide appropriate assistance to the school lunch project; and
7. To supervise and monitor the school lunch project, to enable all primary schools to improve their instructional methods which enhance desirable characteristics of primary school children through integration of school lunch project in the school curriculum.

A case study at Samutprakarn Primary Educational Office Area 1 in 2012 revealed the school lunch project implementation was affected by economic, social, and political factors. According to the teachers, the factors were:

1. Inter-organizational communication and enforcement activities;
2. The disposition of implementers;
3. The economic, social, and political conditions;
4. The characteristics of implementation agencies.

ชนก แสนติยศ (2015). in “Lunch Project Administration of Basic Education Institutions in Special Area Under Chiang Rai Primary Educational Service Office Area 3.” in Graduate School Journal Volume 8 Number 18 September - December 2015 (pp.1-10) has found the school lunch projects in the schools in Chiang Rai Primary Education Area 3 were highly managed. However, the problems were a lack of supervision and evaluation system and a lack of related people in the supervisory

process. In addition, the equipment, the personnel, and the budget for school lunch project were insufficient. Therefore, the guidelines which were needed included:

1. Clear supervision and evaluation system which is planned together with outsiders;
2. Appropriate allocation plan of necessary equipment for school lunch project;
3. Specific assignment of responsible persons for school lunch project, and for clear maintenance process of equipment and their specific roles.

Also, this study suggested the schools should request personnel support from the community, as well as for budgetary support from other organizations. The research finding also revealed school lunch personnel of the schools were not well qualified, thus the under-qualification affected the nutritious quality of school lunches. The study suggested there were four urgent needs for the improvement of the school lunch project:

1. Clearer supervision and evaluation system of the school lunch project;
2. A Better system for personnel management system of the school lunch project;
3. More support for school lunch equipment; and
4. More budgeting support for the school lunch project (Ibid. pp.8-9).

Nevertheless, upon reviewing the documents posted on the website of the School Lunch Project Fund Bureau, there are a number of guidelines and other useful information distributed in 2017-2018 to enable schools to better manage their school lunch projects (See APPENDIX A).

5. School Lunch Project in Japan in the Early Period

School Lunch Projects in Japan started at the end of 19th century as food service for poor children, and it seems the oldest sample of root of school lunch in Japan was the emergency meal service (called “Takidashi” **たきだし**) when starvation and natural disaster happened. Systematic lunch/food service started for factory girls who worked in a spinning mill factory since 1872, and to army ration.

Later, the school lunch project started for poor children in 1889, although there was no government determination on the educational role of school lunch project at that time (Takahashi, 2017).

In the Edo era (1603-1869) KAIBARA Ekiken (1630-1714), a Confucian scholar and educator, wrote "*Human energy comes from the energy which generates all being of heaven and earth...Outer things, such as drinking and eating, clothes and houses, support human energy and keep lives after the generating...*" He insisted Human energy comes from the energy which is called "Ki (氣)". In the Meiji era (1868-1912), ISHIZUKA Sagen (1851-1909), a scholar in Medicine and Pharmacy, wrote, "...*Today, people, who have children, shall understand which physical education, intellectual education, mind and wisdom education are based on Food and Nutrition Education.*" Later, MURAI Gensai (1864-1927), a writer, wrote "...*For children, Food and Nutrition Education is prior to moral education, intellectual education, and physical education*" in 1903(Murai, 1913).

In the Taishō era, SAIKI Tadasu (1876-1959), a doctor, and also the founder of Nutrition Science Research Institution, founded the Nutrition School (Eiyō Gakkō), and many graduates of the Nutrition School became dietitians. At that time, Saiki funded to supply bread to children who studied in schools under direct supervision of Tokyo Prefecture (Tokyo Fu). In 1878, Emperor Meiji (1852-1912) visited the Chubu region where a Confucius institute was being reformed towards the modern education system but the children couldn't well absorb the knowledge of the West. The Emperor requested revealing root mentality of national education be provided. MOTODA Nagazane (1818-1891), the Minister of Education responded to the Emperor and created guideline which education would aim to reveal humanity, justice, loyalty, and filial piety and pursue knowledge, wisdom and arts towards fulfilling path of human life. Thus, we found, before and during world wars, the role of school lunch project in Japan changed to improve physical health and Confucianism-based moral education of school children (MEXT, 2008).

Then, after World War II, US President Harry S. Truman (1884-1972) assigned US Army General Douglas MacArthur (1880-1964) to Supreme Commander for the Allied Powers (SCAP) on 14 August 1945. SCAPIN-422: Nutrition Surveys of Civilian Population was issued in December 1945. The targets of the survey were all

civilian population aged over 1 year old, who were stratified and randomly extracted from the general census areas from across Japan. Since the survey by SCAP in 1945, the National Health and Nutrition Survey has been conducted annually.

There were starvation victims in Japan in October 1945. For example, in central Tokyo area, 2.5 starvation victims per day in Ueno station, and 6 starvation victims per day in Ueno Park. Children who have rice meal 3 times a day are just 1.8% of children in Japan. 42.9% of children couldn't have a rice meal, due to it, they ate sweet potato instead of rice meals (Iwasaki, 2009).

According to Nakamura (2022), Iwasaki (2009), President Harry S. Truman gave former President Herbert Hoover a special mission to inspect the Asia area. Herbert Hoover of the United Nations Relief and Rehabilitation Commission related food administration in postwar. Lambers (n.d.) wrote he already had achievement to resume school lunch in Germany after World War I. He visited and inspected Japan in summer 1946 then advised GHQ to resume school lunches in Japan. Kondo (2018) stated Germany experienced the worst food crisis in 1947. Because of food stocks running out, decreasing agricultural production, severe winter and summer in Germany.

US Army Brigadier General Crawford F. Sams (1902-1994), the Chief of Public Health and Welfare division of GHQ, made efforts to improve preventive medicine, medical treatment, social welfare, and social security system. He integrated these 4 fields and introduced the school lunch project from the view of preventive medicine to recover children's health, expected it would prevent disease and decrease medical expenditure. He related to establish Article 25 of the Constitution of Japan (Kubota, 2012; Sasaki, 2018). General Crawford F. Sams was a founder of school lunch project in Japan after World War II. School lunch project with bread and skim milk was officially provided with Aid from SCAP. The Japan School Lunch Association was established in 1950 (NIER, 2013).

Nevertheless, one of the international Aid (GARIOA) came to an end in 1951, after the Treaty of Peace signed between US and Japan. Japanese people still wanted to continue school lunch, however. Thus, in 1954, the government of Japan enacted the School Lunch Project Act (Act No.160 of 1954). The wheat flour from the US had been fortified bread since 1953, and Bread-based School Lunch was adopted in

Japanese schools across the country ever since. In 1970, the Physical Education Council in Ministry of Education suggested Rice-based meals instead of the bread-based meals, therefore the rice-based school lunch has been formally implemented since 1976. (ibid.)

According to Harlan (2013) post-war school meals in Japan were mainly powdered skim milk, bread, and daikon radish received from international donations. From the end of 1950s to 1960s, the school lunch project was a part of School Events, then became a part of Special Activities. In the 1970s, school meals in Japan reached modern-day standards. From 1970 to the end of 20th century, a requirement for rice-based meals and qualified nutritionists emerged. MAFF started its interventions in school lunches through developing intensive nationwide programs such as “Nippon Shokuiku Fair” in January 2003. (出版ダイジェスト社, 2004)

6. The Development of Food and Nutrition Education (Shokuiku) in Japan

Tanaka (2012) stated there is a growing concern about increase in obesity and metabolic syndrome among middle-aged men in Japan. Additionally, child obesity has also become one of the important health problems. The increased obesity is possibly associated with inappropriate dietary habits, such as skipping breakfast, excessive fat intake, and insufficient vegetables.

In January 2004, the Ministry of Agriculture, Forestry and Fisheries (MAFF) started its intervention in school lunches through developing intensive nationwide programs called “Nippon Shokuiku Fair,” in December 2004, MAFF in collaboration with the Ministry of Health, Labour and Welfare (MHLW) set up the Food Guide Committee (Ibid.).

A month later, the Basic Act for Food and Nutrition Education was enacted on 17 January 2005 to comprehensively and systematically promote Shokuiku, and the Food Guide Committee was established. In July 2005, the Committee proposed the model for implementation of Food Education called, “*Japanese Food Guide Spinning Top*”, and also recommended the Japanese Dietary Pattern which provides the example of a nutritionally balanced diet composed mainly of cooked rice with traditional side dishes. Again, in 2005, MAFF held “Shokuiku and Health Fair”

nationwide to provide opportunities for local people to show traditional food of local agricultural products (Ibid.).

Yoshiike (2010), explained Dietary guide is usually “food-based dietary guide” in other countries. The “Japanese Food Guide Spinning Top” is the first cuisine-based dietary guide in the world. Because, people eat out, ready-made food, lunch box meal rather than home-cooked meals in Japan. He is the chairperson of the Food Guide Committee. “Japanese Food Guide Spinning Top” is developed to use in eating places, convenience stores and supermarkets, etc., and general consumers can choose healthy food because the guide shows relationship with information and food. It’s to form a healthy food environment among general consumers. There are two approaches of preventive medicine through the Japanese Food Guide Spinning Top. First, the High-risk approach is individual health education for people who have a high risk of lifestyle disease. Second, the Population approach is to connect with information and food in daily dietary habits. The Population approach is the primary concept of the Japanese Food Guide Spinning Top. Yoshiike (2011) expressed clinical medicine projects individual health and disease in natural course, and provides prevention and cure as a countermeasure. On the other hand, public health projects collective health and disease in natural course and provides countermeasure.

“The Basic Law on Shokuiku” enacted in 2005 was the first law which regulates inferior, over and meaningless westernizing lifestyle and declares ideal diet and eating habit as Japanese. For effective implementation of the Shokuiku program, dietitians and registered dietitians would play important roles. The roles of school lunch projects were expanded to cover “Food and Nutrition Education” to provide for 7 elements:

1. Sustaining and improving health through proper nutrition;
2. Fostering understanding, decision-making and eating habits for an appropriate diet;
3. Livening school life and encourage an actively social and considerate spirit;
4. Furthering the appreciation and respect of life and nature, and encouraging the spirit of environmental conservation;

5. Acknowledging how the food industry is supported by the activities people and to respect their hard work;
6. Furthering the understanding of traditional, regional and local Japanese cuisine; and
7. Leading to correct understanding of food production, transportation, and consumption (NIER, 2013).

Three-Domains of Food and Nutrition Education are Taiiku – physical education; Chiiku – intellectual education; and Tokuiku – moral education. The Three-Domains are based on Food and Nutrition Education.

In 2007, to further enhance the school-based Shokuiku programs, the Diet and Nutrition Teacher System was established by MEXT, aiming to promote the placement of diet and nutrition teachers in public primary schools and junior high schools. These teachers, having both educational qualifications and nutritional expertise, supervise school lunch projects, formulate menus, and ensure hygiene standards (Tanaka, 2012).

In 2008, the School Lunch Act was revised to comply with the Act for Food and Nutrition Education (Ibid.).

In March 2010, MEXT published “Food-Related Guidebooks” and distributed them to schools. The content of Food and Nutrition Education has been classified into six categories: the importance of food; mental and physical health; ability to select foods; sense of gratitude; social responsibility; and food culture. In conclusion, the Act emphasizes three points in terms of Food and Nutrition Education:

1. Nourishing a right judgment on food;
2. Fostering an understanding of traditional food culture; and
3. Cultivating an attitude to respect life and nature through food.

The other highlights of the revised School Lunch Act include “School Lunch Practice Standard” and “School Lunch Hygiene Control Standard.” The former stipulates proper management of school lunch including reference intake values of

energy and each nutrient. Application of these values could be flexible, considering health situation and daily activity of each child and local circumstances. (Ibid.)

In June 2016, the Japanese Dietary Guideline was revised to change its aim from “improvement of dietary habits” to “promotion of Food and Nutrition Education”. There are four major objectives of the guidelines:

1. To develop a proper understanding of diets and healthy eating habits in daily life;
2. To enrich school life and nurture sociability;
3. To promote the rationalization of diets, nutritional improvement and health promotion; and
4. To enhance a sound understanding on food production, distribution and consumption:

The Dietary Guidelines require Japanese schools implement 10 measures:

1. Enjoying meals;
2. Establishing a healthy rhythm by keeping regular hours for meals;
3. Maintaining the proper weight with adequate exercise and well-balanced meals;
4. Eating well-balanced meals with staple food, as well as main and side dishes;
5. Eating enough grains such as rice and other cereals;
6. Combining vegetables, fruits, milk products, beans and fish in your diet;
7. Avoiding too much salt, and attention to the quality and quantity of fat ingested;
8. Taking advantage of Japanese dietary culture and local food products, as well as preserving local dishes;
9. Conserving food resources and practice dietary habits for minimizing leftovers and food waste; and
10. Developing the understanding of food and reviewing food intake to monitor diets.

7.Important Statistics Related to Food and Nutrition Education in Japan

7.1 About Rice-Based School Lunch

According to NIER (2013), in 2007, the statistics showed 99.2% of primary school children were served complete lunch; 99.7 % were children in public primary schools, and 46.2% in private primary schools. In December 2013, “Washoku; Traditional Dietary Cultures of the Japanese” was designated as a UNESCO intangible Cultural Heritage. According to Yamamoto (2019), approximately 70% of schools across Japan have adopted fortified rice in school lunches. According to MAFF (2022), the school lunch is provided in 99% of primary schools, it is served in 90% of lower secondary schools in Japan nowadays.

7.2. Qualified Nutritional Teachers in Primary Schools

As of April 2011, 3,853 diet and nutrition teachers were assigned to schools all over the country. In these schools, several positive impacts have been reported in terms of health and dietary habits among school children, such as a decrease in the number of absent students, an increase in the number of children who eat breakfast, and a reduced amount of leftovers at lunch. Nevertheless, there remains a problem of manpower shortage, because only about 12% of schools have Diet and Nutrition Teachers (Tanaka, 2012).

8.The Administrative System of Food and Nutrition Education in Japan

The administration of Food and Nutrition Education in Japan today is quite systematic. First, the Cabinet Office was assigned the duties of promoting Food and Nutrition Education. The Basic Plan for the Promotion of Food and Nutrition Education (Shokuiku Suishin Kihon Keikaku) was designed and implemented for the first time by the Council for the Promotion of Shokuiku (Shokuiku Suishin Kaigi) in March 2006.

In 2015, the Basic Act on Food and Nutrition Education was partially revised (Law No.66, 2015). For this reason, the duties of the Cabinet Office on Food and Nutrition Education have been transferred to the Ministry of Agriculture, Forestry and Fisheries (MAFF) since 2016.

The administration of school lunch and Food and Nutrition Education in Japan today is under the responsibility of the three ministries, MEXT, MAFF, and MHLW. Mainly, MEXT handles the administration of School Lunch project, MAFF handles the administration of Food and Nutrition Education, and MHLW handles the administration of physical health. Recently, the Evaluation Committee of Food and Nutrition Education Promotion (Shokuiku Suishin Hyōka Senmon Linkai) was established on September 2, 2019.

Several guidelines have been distributed online by the responsible agencies of Food and Nutrition Education: for example, 1) the Dietary Guideline for Japanese (revised in 2016), 2) the Japanese Food and Guide Spinning Top, 3) the White Paper on Shokuiku, and so on.

MEXT publishes a guidance book of food lessons (Shoku ni kansuru shidoo no tebiki) for Food and Nutrition Education in primary and lower secondary school. Homeroom teachers and licensed nutritional teachers teach Food and Nutrition Education in school lunch time, class hours, and individual support in line with the guidance book. For example, a homeroom teacher teaches the growing process of vegetables in science class which associates with Food and Nutrition Education in cross-curricular approach.

9. Advantages of Comparative Education Studies

To make decisions and to learn from others are two major reasons for studying Comparative Education. Humans are thinkers and observers of the world around them, as the famous French philosopher Rene Descartes (1644) captured this thought through the expression, “Cogito ergo sum” (“I think, therefore I am”). The constant comparing and contrasting is a vital part of what Comparative and International educators do. As humans observe and interact, compare and contrast, they reach conclusions and can make adjustments to their behaviour when necessary. The ultimate goal of this process is to make things better.

One of the main benefits which arise during the process of learning from others is a better understanding of society (Durkheim, 1982). Researchers of Comparative Education analyze the culture, language, history, traditions, laws, and other factors in different locations, so they also gain a better global understanding of

such settings and are able to draw parallels and distinctions between them. In turn, they are better informed and more capable of suggesting changes and influencing decisions in their own educational setting (Leite, 2014).

10. Primary Schools in Phitsanulok Province and the School Lunch Movement

10.1 The Administration of Primary Schools in Phitsanulok Province

Phitsanulok is a province in the lower-northern region of Thailand. The province covers the area of 9 districts, a total of 750.80 square kilometers (as of 2015). Primary education is the lower part of tuition-free compulsory education, covering 6 years from Grades 1 to 6 for children aged 6 to 12 years old. The students who go to private or special-typed primary schools pay some tuition and fees, however.

The administration of public primary schools is responsible by the Office of Basic Education Commission (OBEC), under the jurisdiction of the Ministry of Education. There are three primary education areas in Phitsanulok, called the Primary Education Office (PEO) Area 1, 2, and 3. The PEO Area 1 takes care of primary education in Muang District and Bangrakam District, while PEO Area 2 looks after the primary schools in Bangkratum District, Wangthong District, and Noen Maprang District. The PEO Area 3, which has smaller population in each district, looks after primary schools in Phrompiram District, Watbot District, Nakornthai District, and Chart Trakarn District.

10.2 The School Lunch Movement

There was a seminar on Model of School Lunch projects in Primary Education Office Area 1 of Phitsanulok, on 21 June 2018, at Amarin Lagoon Hotel in Phitsanulok. Here, the deputy governor of Phitsanulok, Mr.Paibool NaButrjom, appraised four good practices of school lunch projects at Wat Tan School, Wat Tungsa School, Jakarnboon School, and Wat Laempoh School.

Wat Tan School, a small-sized school, was successful in applying the Sufficiency Economy philosophy in food production at 6 learning centers: Mushroom Growing Center; Frogs and Cat Fish Raising Center; Poison-Free Vegetable Planting Center; Hen Raising Center; and Lime Planting Center.

Community people have also been encouraged to continually support the learning in these centers.

At Wat Tungsa School, parents are engaged in the cooking of school lunches. Some parents also helped manage rice milling, as well as selling the rice.

At Jakarnboon School, the large size school with 1,800 students, the implementation focused on the school cafeteria strategy which each student received subsidy money and freely shop the food up to two menus.

At Wat Laem-poh School, a school where compulsory expanding education from Grades 1 to 9 was provided, the project called “Bright Cheeks Thai Kids” was implemented. The children were engaged in 8 activities which include: school farming; students’ cooperation; school food service management; nutrition follow-up; health habits development; development of school hygiene and environment; health service management; and the instruction of agriculture, nutrition, and health and hygiene (Phitsanulok Primary Educational Service Area Office 1, 2018).

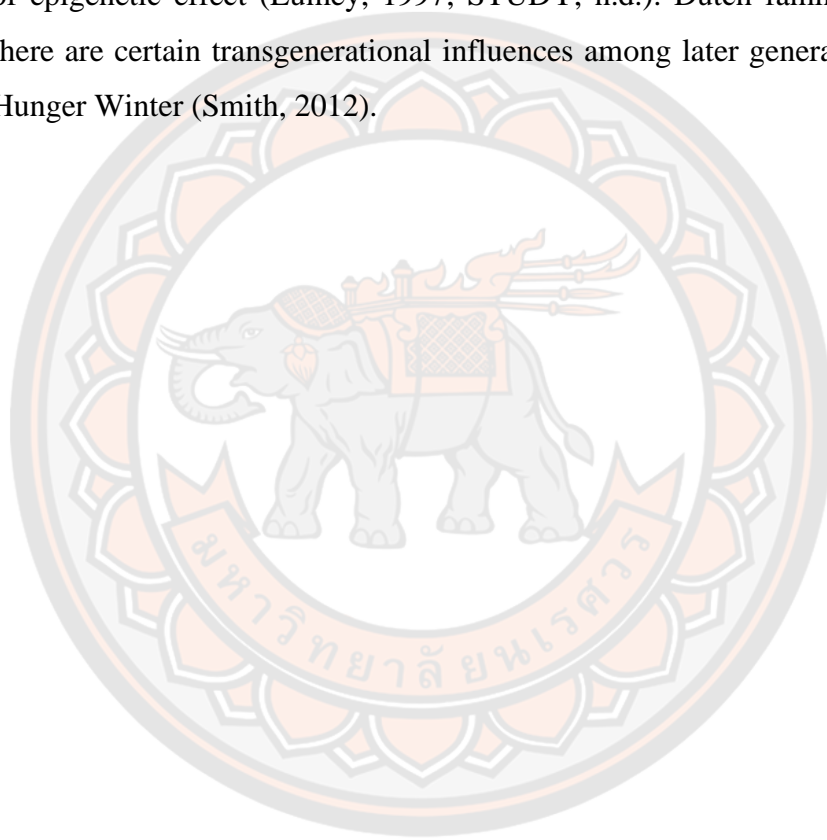
The information expressed there are various types of school programs in these primary schools, but the evaluation of the Food and Nutrition Education in the scope of Japanese Shokuiku has not yet been exercised.

10.3 Some Administrative Problems in School Lunch Projects of Phitsanulok

Sripatta (2021) explored the school lunch project management by collecting data from 266 participants, comprising administrators and teachers in 130 schools in primary schools in Phitsanulok Province. The findings revealed, in general, the school lunch projects were managed at a high level; the problem related to the project input was slow budget allocation; the drawback concerning its process was too excessive requirement of documents; and the problem of the project output was too much eating and obesity problem of the children. Therefore, the researcher suggests health professionals and nutritionists should visit the schools and evaluate students’ health.

10.4 Research-related risk of epigenetic influence

School lunch project is important to prevent malnutrition. Malnutrition-related disease was recognized in Germany after World War I (Aoki, 2014) Dutch, Germany and Japan, etc., after World War II. British Actress Audrey Hepburn experienced and survived the Dutch Hunger Winter from 1944 to 1945. According to Spoto (2006), Audrey Hepburn survived by eating tulip bulbs. Hunger doesn't only stir up social, political, and public fear also there is a risk of epigenetic effect (Lumey, 1997; STUDY, n.d.). Dutch famine study stated there are certain transgenerational influences among later generations of Dutch Hunger Winter (Smith, 2012).



10.5 Research Conceptual Framework

1. The research conceptual framework includes the independent variables and the dependent variables

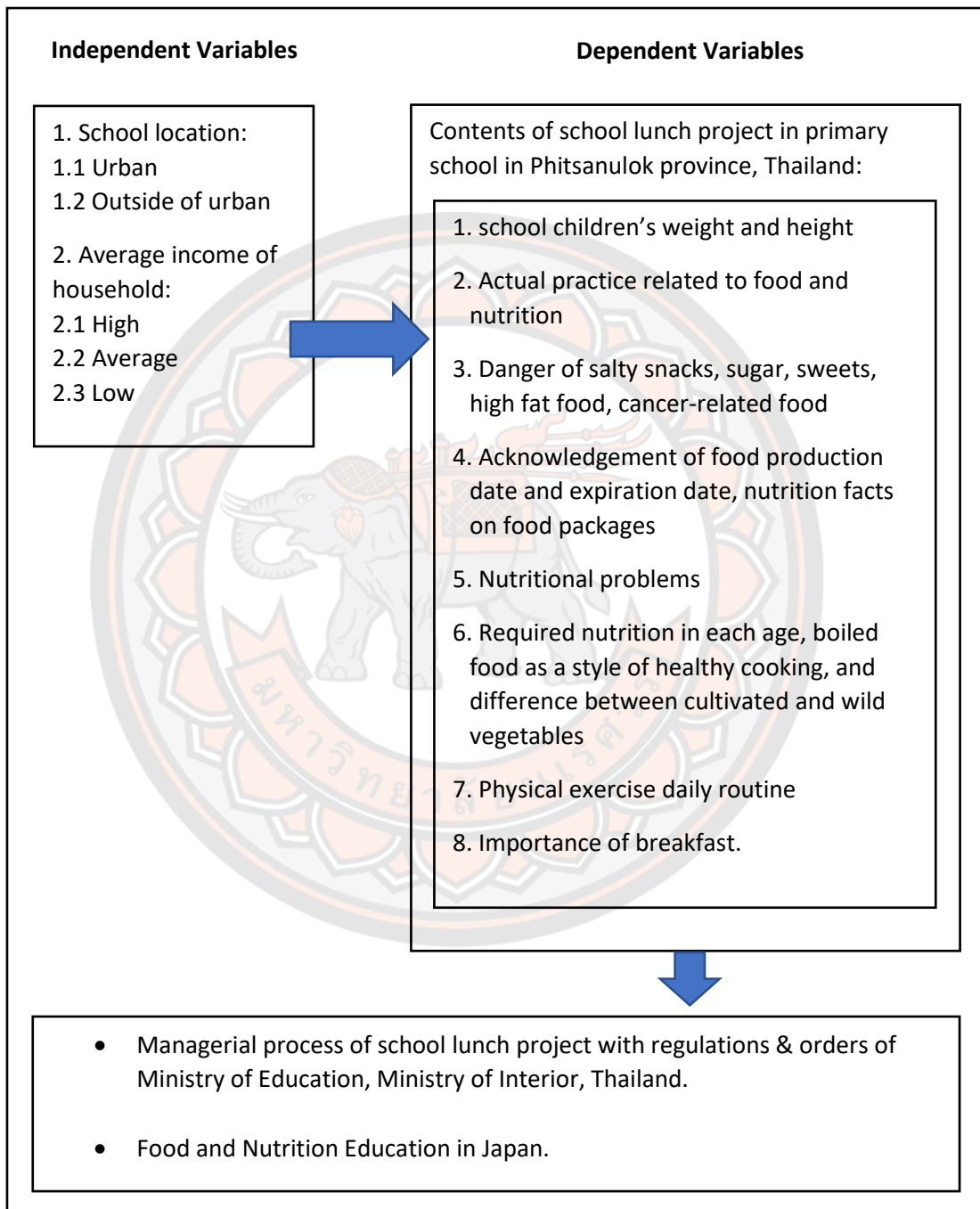


Figure 1: Research Conceptual Framework (1)

2. The research conceptual framework school feeding, school lunch project and Food and Nutrition Education in Japan.

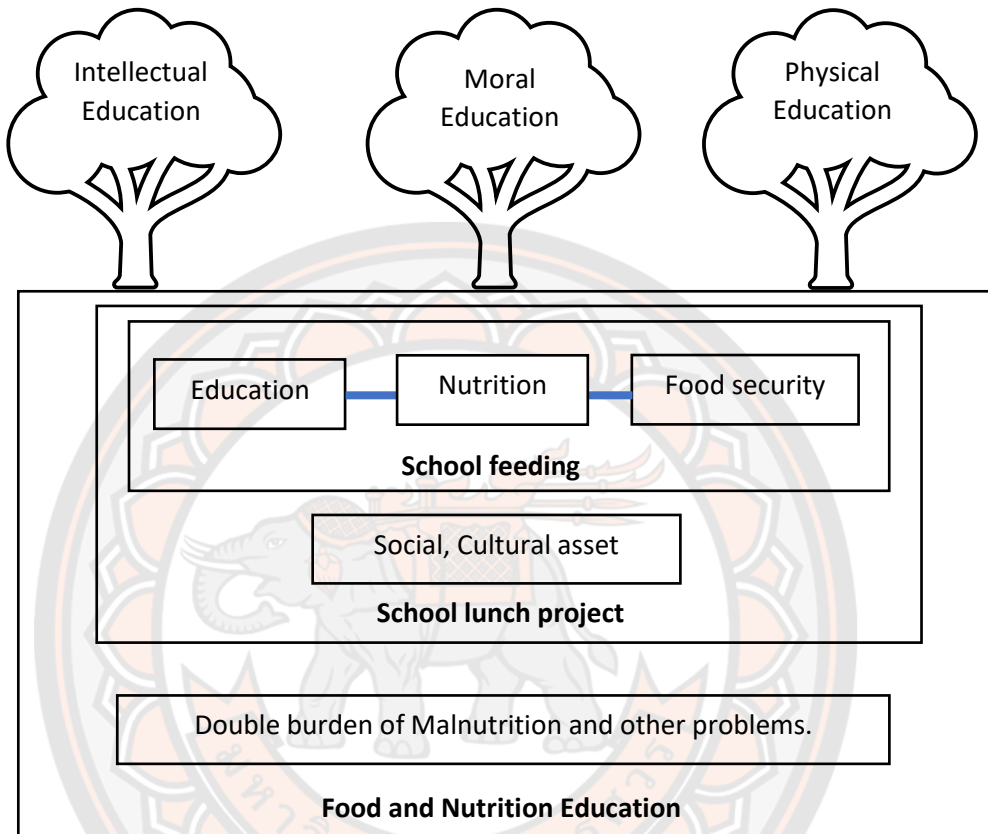


Figure 2: Research Conceptual Framework (2)

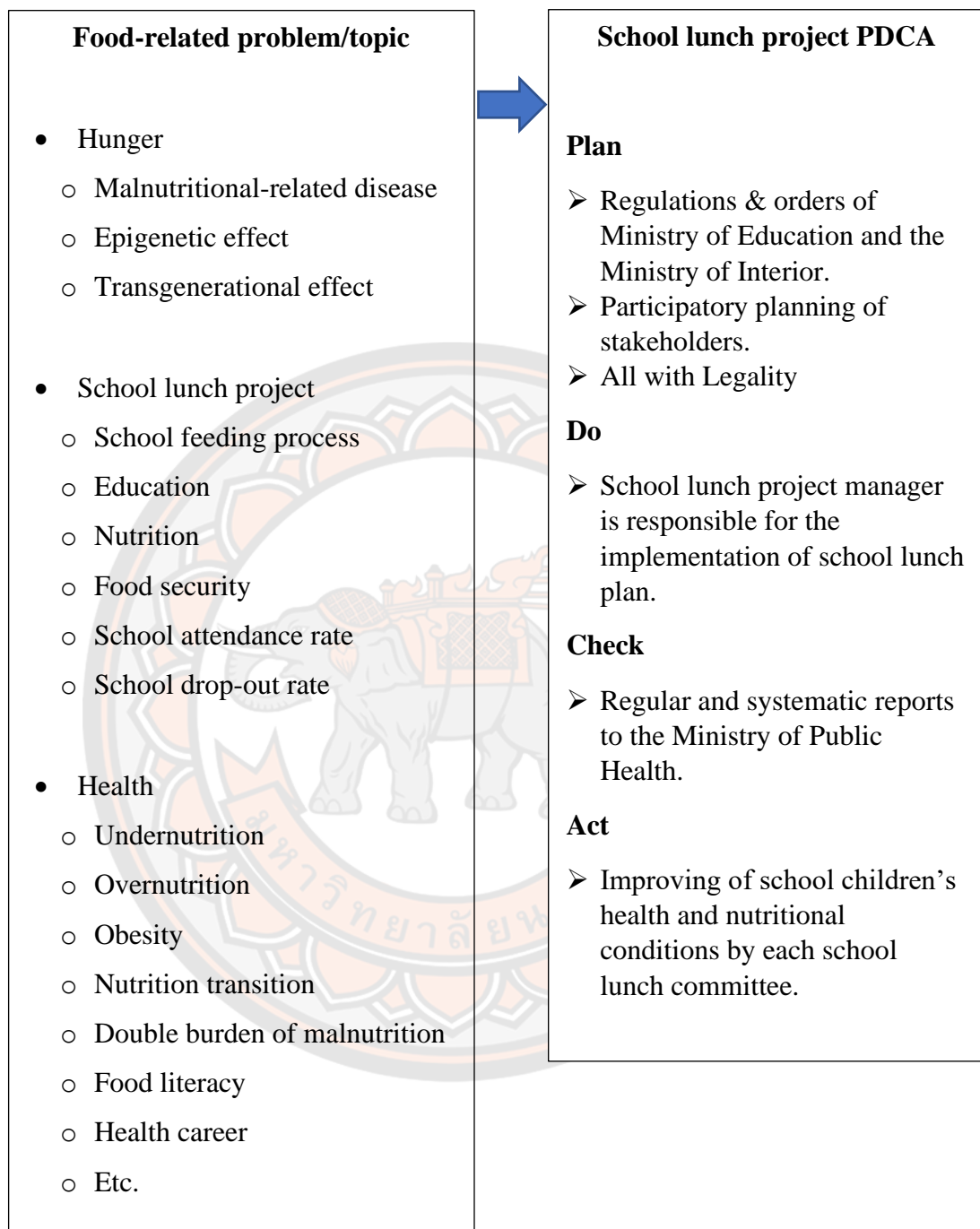


Figure 3: Research Conceptual Framework (3)

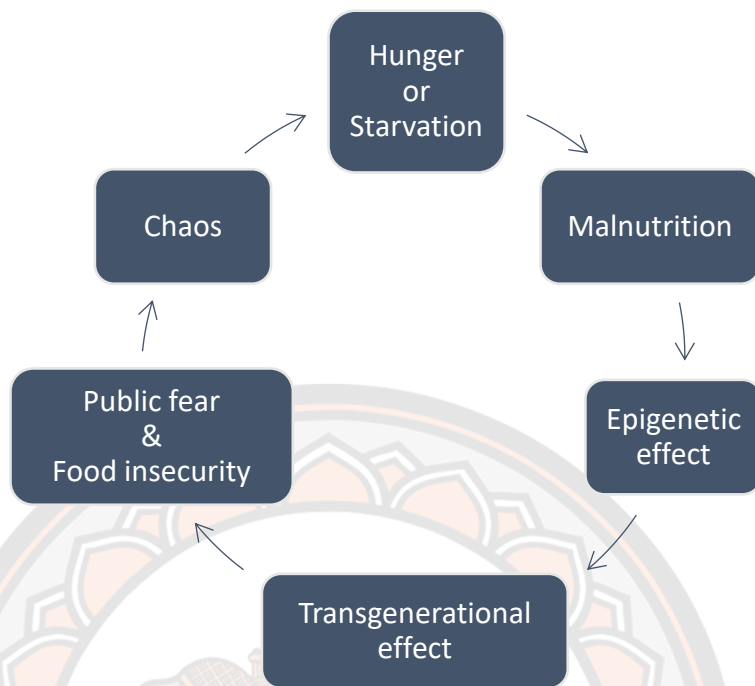


Figure 4: Before school lunch project begins in the world.

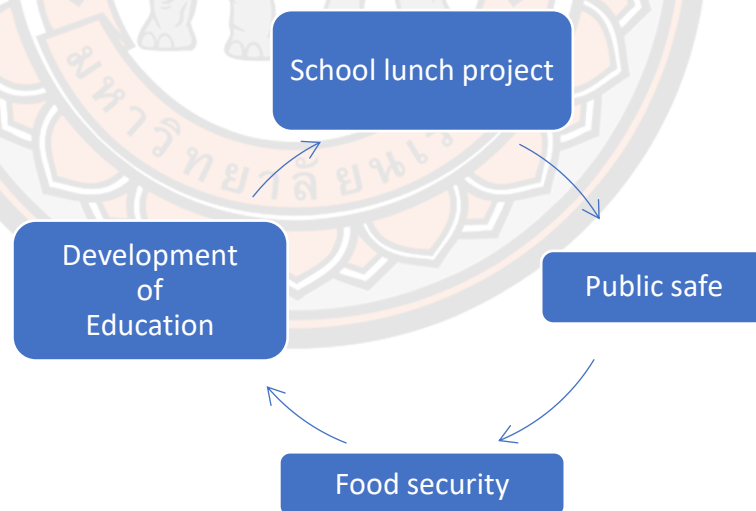


Figure 5: School lunch project and development after World War II.

CHAPTER THREE

RESEARCH METHODOLOGY

This comparative research focused on the following steps:

1. Population and Samples
2. Research instrument
3. Data collection
4. Data Analysis

Part 1: To Study the School Lunch Project between Thailand and Japan.

Population and Sample

1.1 Population

The target population of this study was primary school teachers in Phitsanulok province, Thailand. There were 9 districts, 399 public primary schools, and 4,813 teachers and educational personnel in Phitsanulok province (OBEC, n.d.a, n.d.b, n.d.c). 3 primary schools were selected.

1.2. Samples

The sample of this study was primary school teachers and principals. We could interview with the cooperation of Primary school principals, teachers, and Doctors of Naresuan University.

2. Research instruments

The qualitative research instrument was used in this study was the questionnaire form with structured questions based on a survey in primary school children in Iran (Doustmohammadian et al., 2017).

3. Data collection

The researcher visited 3 primary schools in Phitsanulok province, in the academic year 2022 to collect data. The data was collected by interviewing school principals and teachers. We could interview and receive the answers to the survey. Then it was compiled to analyze.

4. Data analysis

After data collection, the following procedure of data analysis was performed.

Part 2: To comparative study and survey in school lunch projects in Phitsanulok.

To explore and compare the historical development of Food and Nutrition Education in school lunch projects of primary schools in Japan and Thailand, and to survey the actual states of Food and Nutrition Education in selected primary schools in Phitsanulok Province, the qualitative methods are employed as explained below.

1. The Historical Method Approach of Comparative Education

According to Camponotes.com (2013), the historical method of comparative education reveals the basis on which the modern education system is based. We employ this method not only to know the past in order to understand the present better, so that we may improve the future by hinting at those factors which may be more useful. We also try to understand all geographical, social, political, religious, and linguistic factors which influence the educational system of a country. Scholars such as Nicholas Hans, Isaac Kandel, Schneider, and Michael Sadler are known for popularizing this method.

The scholars who advocated for this approach did not offer a definite procedure to be followed, it is generally agreed three things, stand out;

1. Study each national system separately in its historical context, taking note of differences in terminologies and methods of collecting and classifying data;
2. Analyze the forces, and factors responsible for the noted differences are grouped into four categories i.e. natural, religious, social, economic, and political.
3. Adopt only those ideas and practices are most appropriate and can be adapted to the recipient country's historical context.

Therefore, in this particular research, a documentary analysis of previous studies will be descriptively conducted on the historical developments of Food and Nutrition Education in school lunch projects in primary schools in Japan and Thailand.

The analysis will be focused on the forces and the factors responsible for the noted differences such as:

1. The objectives of Food and Nutrition Education
2. The administrative systems of Food and Nutrition Education
3. The inputs, i.e., policy, budgets, etc.
4. The managerial processes of Food and Nutrition Education
5. The outputs and outcomes of Food and Nutrition Education.

Then, after the juxtaposition of these data, a comparison of the significant aspects will be presented in flow charts which chronologically explain the key events of each country.

Part 3: Details of the research to study school lunch project

1.1 Data sources

For the second part of the study, the data sources are composed of principals of primary schools in Phitsanulok province. Purposeful sampling was used for qualitative research.

Table 1: Details of Principals selected from Phitsanulok province

Sample Number	Name	Title	Primary school
1.	Mr. Sophon Khawtaem	School principal	Ban Krang school
2.	Ms. Sana Anong Chura	School principal	Ban Nong Prue School
3.	Mr. Phraison Chansuri	School principal	Wat Senat school

1.2 Research instruments

The interview about school lunch project process with literature review was employed as the research instrument in this section of the study. A smartphone was used as a digital voice recorder to capture qualitative data from the three principals and a few teachers at primary schools in Phitsanulok. The principals and teachers were asked fifteen questionnaires and open-ended questions which freely expressed their ideas and knowledge on the school lunch project process.

1.3 Data collection

The data was gathered through interviews with three primary school principals and a few teachers in Phitsanulok province. The interview asked 15 questionnaires and open-ended questions to get principals' experience, perspectives and ideas on school lunch project process. A one-on-one interview was held and recorded. A smartphone as digital voice recorder was used to gather qualitative data, and information through the interview.

The researcher followed the steps for collecting data:

1. The researcher got permission from three principals of primary schools in Phitsanulok to conduct interview.
2. The researcher prepared the interview questions that understand the school lunch project process in Phitsanulok, Thailand.
3. The researcher prepared for the interview ahead of time, printing questionnaires and using a smartphone as a digital voice recorder while conducting the interviews.
4. Prior to the interview, the researcher notified the principal by calling to visit three primary schools in Phitsanulok province with Doctors of Naresuan university.
5. Three primary schools were identified and the tools prepared, locations and dates for conducting the interviews for each principal were decided.

1.4 Data Analysis

When the data collection is done, content analysis is used to examine the data. It's done with the information gathered during the interview session.

CHAPTER FOUR

RESEARCH RESULT

The analysis of collected data was descriptive, based on the historical method approach of comparative education in the first part, and followed by the analysis of the data from survey methods in the second part.

Part I: The Analysis of Historical Development of Food and Nutrition Education in Primary Schools of Japan and Thailand

1. Emergence of School lunch projects

1.1. In Japan:

The first School lunch project began in 1889 during the Meiji Era, as food service for poor children in primary schools (MAFF, 2020). After World War II, Bread and Skim milk-based school lunch was adopted. It was officially provided with Aid from Government Appropriation for Relief in Occupied Areas Fund (GARIOA).

1.2 In Thailand:

The beginning stage of school lunch project in Thailand started since 1952, by the Ministry of Education (Singsatit, 2012).

1.3 Similarities and Differences:

Similarly, both countries focused on children in primary school. A great difference is the time when school lunch service started. Considered from the beginning years, Japan started its school lunch project in its primary schools about 60 years before Thailand began at the national level.

2. School lunch projects after World War II to Early 21st Century

2.1 In Japan:

Before and during world wars, the role of school lunch projects in Japan, as food service for poor children, changed to improve the physical

health of school children. The Japan School Lunch Association was established in 1950, beginning of the expansion and good qualification of lunches. During the end of 1950s to the end of 1960s, the school lunch project was a part of School Events, then a part of Special Activities. The school lunch project became a provision for character education as well as physical development of all primary school children. From 1970 to end of the 20th century, requirement for rice-based meals and qualified nutritionists emerged. MAFF (Ministry of Agriculture, Forestry and Fisheries) started its interventions in school lunches by developing intensive nationwide programs such as “Nippon Shokuiku Fair” in January 2004 (出版ダイジェスト社, 2004).

2.2 In Thailand:

The school lunch project in Thailand has been supported by law since 1992 (B.E.2535), enacted by the Act for School lunch project Foundation on 9 April 1992 (Singsatit, 2012). The Ministry of Education found many good results but needed budgetary support to make the program more effective; and to cover the total number of students in need of school lunch service.

The Act for School Lunch Foundation has provided for funding of at least 500 million Baht per year until the basement fund of the foundation reached 6,000 million Baht. The benefits from this fund would be used for school lunches in primary schools of all types. In 1992-1998, the school lunch budget was 5 Baht per head per day, 200 days per year. In 1999, the subsidy increased to 6 Baht per head per day.

2.3 Similarities and Differences:

Similarly, both countries have officially supported school lunch projects in their primary schools since after World War II until today. However, the role of school lunches in primary schools in Thailand seems to focus mainly on providing lunch service to students in need, while the role of school lunches in Japan has provided further to cover character education as

well as physical development of all primary school children. Furthermore, the Ministry of Agriculture, Forestry and Fisheries of Japan began its intervention through an intensive nationwide program of school lunches in 2003.

3. Food and Nutrition Education in School Lunch of the 21st Century

3.1 In Japan:

In 2005, “Food and Nutrition Education”, (Shokuiku) was positioned as the basis of human life which is fundamental to intellectual education, moral education, and physical education. The government of Japan has expressed the vision “Food and Nutrition” are the most important, to ensure physical and mental health for all citizens. “School lunch project” (Gakkō Kyūshoku) is the core of “Food and Nutrition Education”. (Basic Act on Shokuiku, Food and Nutrition Education. Shokuiku kihonhō. Act No. 63 of June 17, 2005). The Vice-chairman of Washoku Association of Japan said “The basis of Shokuiku is in school lunch project (Shokuiku no kihon wa kyūshoku ni aru)” (T. W. A. o. Japan, 2021).

A supportive system of Shokuiku has been developed as shown in the table below:

Year/Month/Date	Event/Significant Action(s)
December 2004	MAFF (Ministry of Agriculture, Forestry and Fisheries) in collaboration with MHLW (Ministry of Health, Labour and Welfare) set up the Food Guide Committee
January 17, 2005	The Basic Act for Food and Nutrition Education was enacted The emphasizes three points: (1) nourishing a right judgment on food; (2) fostering an understanding of traditional food culture; and (3) cultivating an attitude to respect life and nature through food.
July 2005	The Food Guide Committee proposed the model for implementation of Food Education, called “Japanese Food Guide Spinning Top” providing the example of a nutritionally balanced diet with a staple dish composed mainly of cooked rice with traditional side dishes including fish, meat, milk, and milk products, vegetable, seaweed, beans, fruits, and tea.
2005	MAFF held “Shokuiku and Health Fair” nationwide to provide opportunities for local people to show traditional food made from local agricultural products.
2007	MEXT (Ministry of Education, Science, Culture and Technology) established the Diet and Nutrition Teacher System to promote the placement of diet and nutrition Teachers in public primary schools and junior high schools.
2007	There were only 2,600 licensed diet and nutrition teachers across the nation. Positive impacts such as increasing of school attendants, the number of children eating breakfast, and the number of children without leftovers.

2007	99.2% of primary school children were served with complete lunch. They were 99.7 % children in public primary schools and 46.8% in private primary schools.
2008	The School Lunch Act was revised
Year/Month/Date	Event/Significant Action(s)
2008	Municipalities bear the costs of facilities and manpower, whereas parents cover the cost of ingredients, an average of 4,000 Yen/student/month.
2008	The places for school lunch preparation are divided into two types; the school's kitchen (43.4%), and the food service centre which prepares and delivers lunch to multiple schools (54.8%).
March 2010	Food-Related Guidebooks, published by MEXT, were distributed to schools. The contents of Shokuiku were classified into six categories: (1) the importance of food; (2) mental and physical health; (3) ability to select foods; (The T74 Newsletter) sense of gratitude; (5) social responsibility; and (6) food culture,
April 2011	The number of licensed diet and nutrition teachers increased to 3,853 across Japan, still insufficient (only 12%).
December 2013	“Washoku; Traditional Dietary Cultures of the Japanese” was designated as a UNESCO tangible Cultural Heritage.
2015	The Basic Act on Food and Nutrition Education was partially revised (Law No.66, 2015). The duties of the Cabinet Office on Shokuiku have been transferred to MAFF since 2016.
June 2016	The Japanese Dietary Guideline was revised, and its aim changed from “improvement of dietary habits” to “promotion of Shokuiku”. The four objectives are: (1) to develop an understanding of diets and healthy eating habits; (2) to enrich school life and nurture sociability; (3) to promote the rationalization of diets, nutritional improvement and health promotion; and (4) to enhance understanding on food

	production, distribution and consumption.
June 2016	Ten Measures Required by the Revised Dietary Guideline: 1) enjoying meals; 2) keeping regular hours for meals; 3) maintaining the proper weight; 4) eating well-balanced meals; 5) eating enough grains; 6) combining vegetables, fruits, milk products, beans, and fish in the diet; 7) avoiding too much salt; 8) taking advantage of Japanese dietary culture and local food; 9) conserving food resources and minimizing leftovers; and 10) developing the understanding of food and dietary life.

3.2 In Thailand:

After 1992, the School Lunch Project Fund Bureau was established in the Ministry of Education. The Committee for School Lunch Project Fund was also appointed, comprising executive officers from the Ministry of Education, the Ministry of Finance, the Ministry of Public Health, the National Budget Bureau; the Community Development Department; the National Accounting Department; the Patrol Police Department; Bangkok Metropolitan; the Private Education Commission; the Office of Basic Education Commission; and 4 experts. Their roles are to set up guidelines, allocate subsidies, cooperate with other agencies; publicize, monitor and evaluate, and appoint sub-committees.

The following table shows the historical development of Food Education in school lunch projects of primary schools in Thailand in the 21st Century.

Year/Month/Date	Event/Significant Action(s)
2001	Budget allocation for subsidy of the school lunch projects was transferred to the Ministry of Interior.
2003	Seven objectives of the school lunch project in primary schools: 1) to provide enough nutrition to children with under-nutritious problems; 2) to manage food service so that all children receive nutritious lunches; 3) to inspect food quality

	so that children have nutritious and clean food for lunch; 4) to integrate any activities linking with school lunch projects into related learning areas of the national primary education curriculum; 5) to manage activities that provide support of money, materials, and labor force to school lunch project; 6) to coordinate with other organizations that are able to assist with the school lunch project; and 7) to supervise and monitor the school lunch project so that all primary schools can improve instructional methods that enhance desirable characteristics through integration of school lunch projects in the curriculum.
Year/Month/Date	Event/Significant Action(s)
2008 January, 31	The Act for National Food Committee was enacted. Article 3 states “Food Education” is “the processes that promote, develop and research to acknowledge and provide for realization and correct behaviours about the food chain and food consumption.”
2012	A study in Samutprakarn revealed School lunch projects in primary schools were affected by 4 major factors: inter-organizational communication and enforcement activities; disposition of implementers; economic, social, and political conditions; and characteristics of implementation agencies.
2015	A study in Chiangrai revealed school lunch projects in primary schools there were highly managed. However, the problems were related to a lack of supervision and an evaluation system, a lack of evaluation personnel, and an insufficient budget. Guidelines for the management of school lunch management were also in need.
2017-2018	Several guidelines are distributed and posted online for primary schools to use for the management of their school lunch projects.
2021	A study in Phitsanulok Province found similar problems as the

	study in Chiangrai.
Present (2023)	The School Lunch Project Fund Bureau states 10 measures: 1) providing good lunches with high quality, hygienic, nutritious, and safe; 2) keeping correct and up-to-date data of the school lunch projects; 3) enabling the prevention and solving of mal-nutritional problems among school children; 4) promoting a variety of active learning experiences integrated in the school lunch projects; 5) promoting physical exercises, for school children and community people; 6) promoting and developing healthy habits of school children; 7) promoting supports from partners to cooperatively manage the school lunch project; encouraging schools, to use “Thai School Lunch” project; 9) publicizing results of school lunch project; and 10) enhancing the Sufficiency Economy Philosophy in school lunch projects, and gearing towards the sustainable development.

3.3 Similarities and Differences

Similarly, the terms “Shokuiku” or Food and Nutrition Education, and “อาหารศึกษา” or Food Education emerged in the first decade of the 21st in Japan and Thailand, although Japan had practiced Shokuiku by private education organizations in the past since Edo era, while in Thailand the National Healthy Codes requires some domain of Food Education and regularly practice in Thailand for a long time.

Other similar ideas are subsidy sharing by the public and guardians; roles sharing for administration and control by central government agencies; and recognition of the importance of guidelines for management of the school lunch projects.

However, there are several differences when specifically dealing with Food and Nutrition Education, such as:

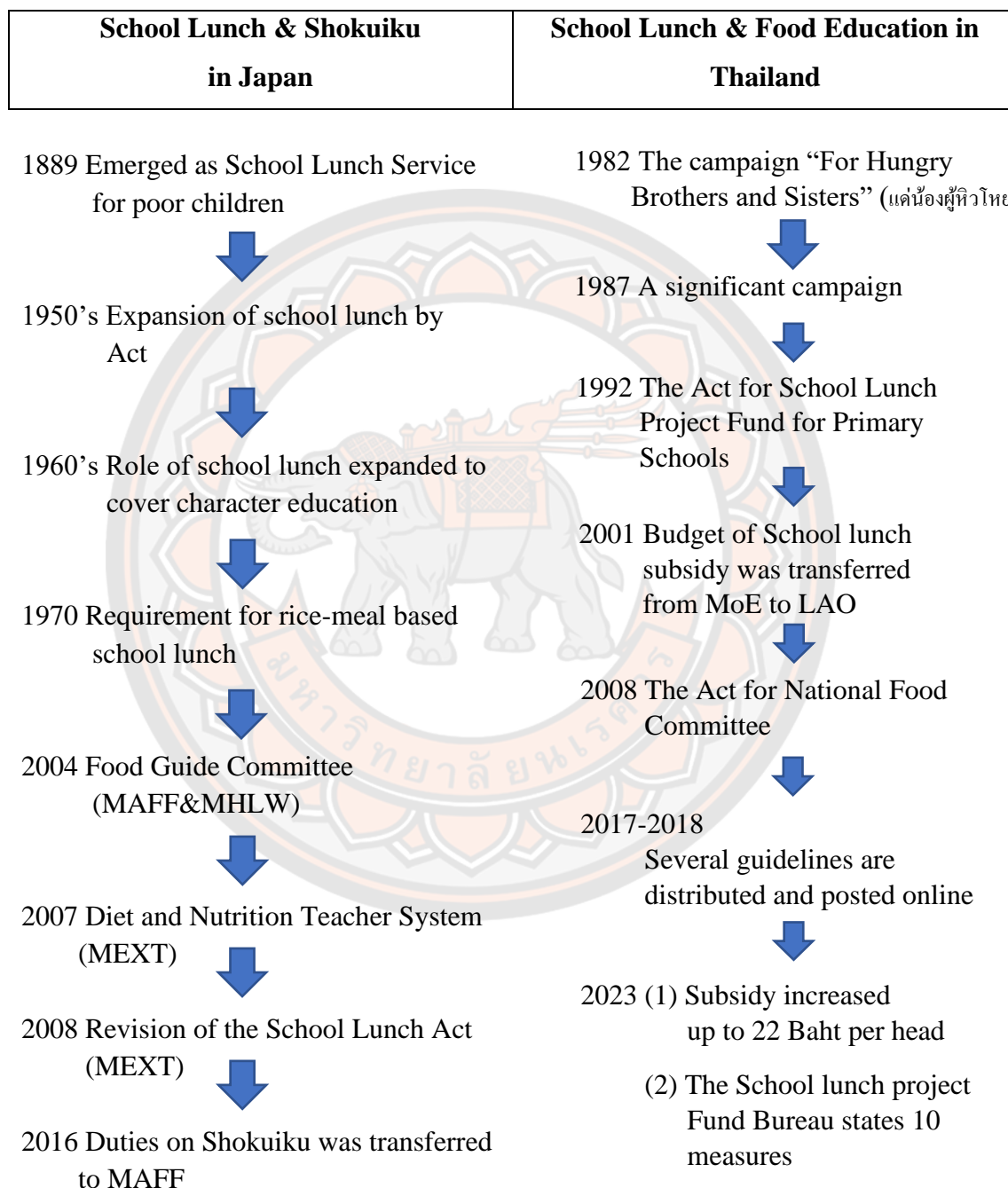
1. Japan has already provided legal bases for diet and nutrition teachers, while Thailand has not.
2. Japan has focused on eating breakfast and balanced meals more clearly than Thailand.
3. Thailand has focused on the integration of food production activities in the school lunch project, as a means of sufficiency economy training, while Japan does not mention this matter.



4.A Comparison of Historical Development of Food and Nutrition

Education in School lunch projects of Japan and Thailand

The comparison will be shown in the two parallel flow charts as shown below.



5. An Analysis of Forces and Factors Responsible for The Differences

The forces and factors responsible for the differences of objectives, administrative systems, inputs, and management process of Food and Nutrition Education in Japan will be displayed in tables and figures below.

5.1 Related to the Objectives of Shokuiku and Food Education:

There are different forces and factors responsible for mandating the objectives of Shokuiku cover education about food and nutrition in Japan; and the objectives of Food Education of Thailand seem to pay less attention to “nutrition”. The analysis of data in the next paragraph should give more information about the administrative systems which are different.

Table 2: A Comparison of the Forces and Factors Responsible for Objectives of Food and Nutrition Education in Japan and Thailand

Japan	Thailand
2004 From the Cabinet and the Food Guide Committee	2008 The National Food Committee Became the major force for “food Education” and its objectives, in accordance with the provision of the Act for National Food Committee of B.E.2551.
2016 The general objectives of Shokuiku (Food and Nutrition Education) for all people from birth to death are announced by MAFF; while the objectives of Shokuiku in school lunch project of primary school are the forces come from MEXT.	2023 The School lunch project Fund Bureau, Ministry of Education, announced 10 measures for school lunch project funding.

5.2 Related to the administrative systems of Food and Nutrition

Education

5.2.1 Japan

The administrative system of Food and Nutrition Education (Shokuiku) in Japan today is largely shared by MAFF and MEXT, as shown in Figures 6, 7, and 8.

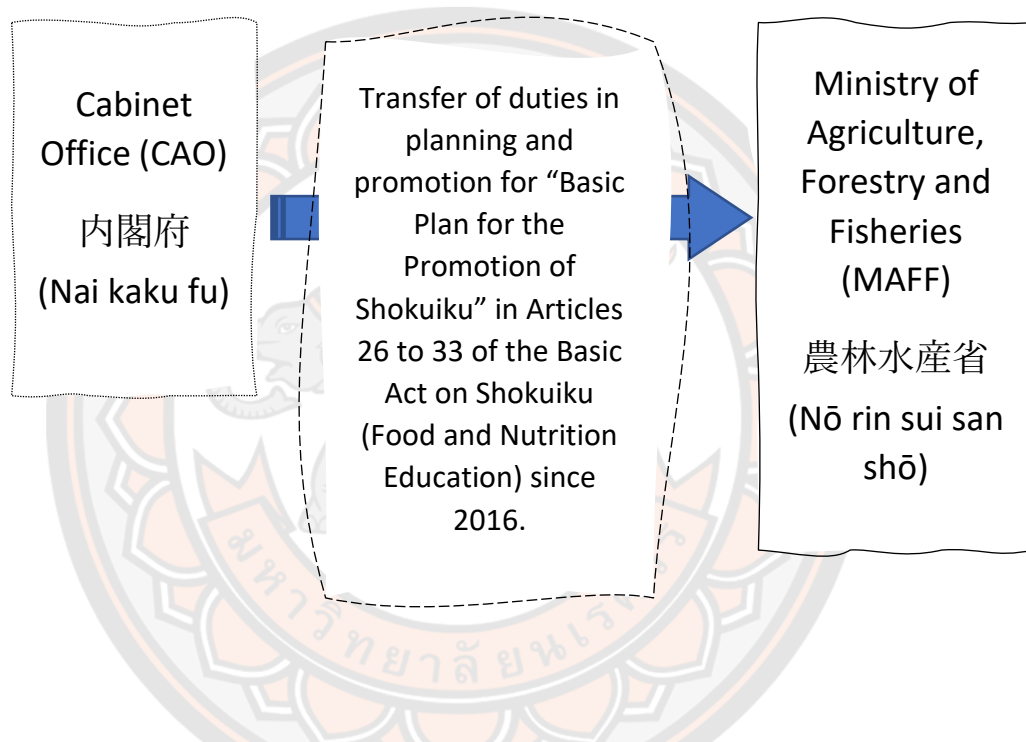
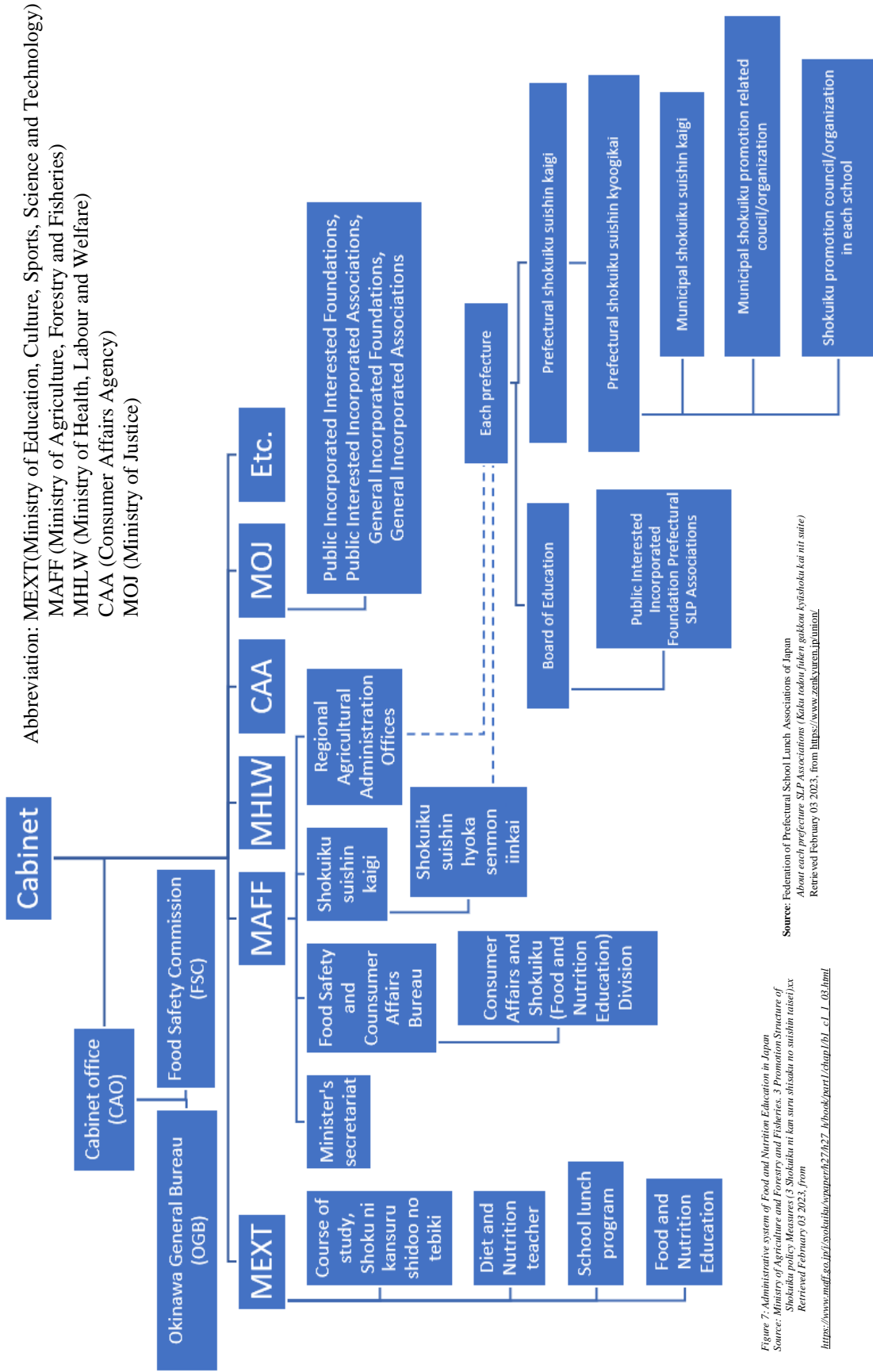


Figure 6: Transfer of duties from CAO to MAFF

Source: Ministry of Agriculture and Forestry and Fisheries. 3 Promotion Structure of Shokuiku policy Measures (3 Shokuiku ni kan suru shisaku no suishin taisei) Retrieved February 03 2023, from https://www.maff.go.jp/j/syokuiku/wpaper/h27/h27_h/book/part1/chap1/b1_c1_1_03.html



In Japan, the Food and Nutrition Education emerged under the administration of the Cabinet Office (CAO). Then, in 2016, the responsibility for planning of Basic Plan for Shokuiku was transferred to the Ministry of Forestry and Fisheries (MAFF). Under the administration of the CAO, three ministries and several other organizations are responsible. The Ministry of Education, Culture, Sports and Technology (MEXT) takes care of the course of study, diet and nutrition teachers, school lunch project, and the Food and Nutrition Education. MAFF takes care of the food safety and consumer affairs, the Food and Nutrition Education evaluation committee, and the regional agricultural administration. MHLW and the other agencies are standing committees in the National Food and Nutrition Education Committee. Each prefecture has the Board of Education manages Food and Nutrition Education (Shokuiku) in school lunch projects, and Prefectural Shokuiku Suishin Kyōgikai (Food and Nutrition Education Committee of the Prefecture) to promote Food and Nutrition Education in schools under its jurisdiction. The promotion structure of Shokuiku in Figure 8 shows the national campaign is regularly held at the upper level; while people of various groups/organizations including volunteers promote physical and mental health under the comprehensive system of administration of Shokuiku.

In Thailand, the administration of Food Education in school lunch projects of primary schools is responsible for each school, according to its administrative system, but to meet the standards set by the School Lunch Project Fund Committee to receive school lunch promotion budget as shown in Figure 9.

5.3 Related to the Inputs and Management Processes of Shokuiku/Food Education

There are different forces and factors related to the inputs, processes, and outputs of Shokuiku in Japan and Food Education in Thailand, as shown in Tables 2, 3, and 4.

Table 3 A Comparison of the Inputs Affect Shokuiku in Japan and the Inputs Affect Food Education in Thailand

Japan	Thailand
<ul style="list-style-type: none"> • Objectives as legal provision which covers 7 elements including PE & health education, food science, socio-cultural, and environmental education. • Comprehensive system for the promotion and administration from the national level to prefectural and school levels. • Food and nutrition teachers are required by law. • Guidelines as carefully prepared and distributed from all related ministries and agencies. 	<ul style="list-style-type: none"> • Objectives as a legal provision which covers health and physical education, food production, and school lunch self-management. • National support of the budget with suggestions about the management system of the school lunch project. • Food and nutrition teachers are not required by law. • Guidelines are broadly prescribed.

From Table 3, the inputs affect Shokuiku in Japan are more carefully provided; while those for Food Education in primary schools in Thailand are less comprehensively provided, especially those concerning food and, diet and nutrition teachers and the guidelines for management of Food and Nutrition Education. Another big different point is related to the objectives of Shokuiku add socio-cultural and environmental aspects including the promotion of regional and local cuisine and the understanding of food production and consumption; while the 10 measures for school lunch projects in primary schools of Thailand only focus on having enough food to eat and managerial aspects of the school lunch projects.

Table 4 A Comparison of the process Affects Shokuiku in Japan and the process Affects Food Education in Thailand

Japan	Thailand
<ul style="list-style-type: none"> The quality control by PDCA process is linked from the top level at CAO down to prefectural and school levels, with cooperation of all types of stakeholders. 	<ul style="list-style-type: none"> The PDCA process is emphasized at school level only, for the school lunch project management.

From Table 4, the management process affects Shokuiku in Japan is based on Total Quality Management (TQM) in the participation of all stakeholders starts from the top level down to the school level systematically. In Thailand, the TQM is emphasized at the school level, but not so clearly emphasized at the upper level.

Part 2: An Analysis of the Data from Survey Research

1. About the School No.1 (Ban Krang School)

1) The Context:

Geographically, the school is located in Muang District of Phitsanulok Province. The school community is semi-urban, with a technical university campus nearby. There are many supermarkets nearby, and a big department store is about 5 kilometers away from the school.

The school serves a total number of 376 children, 186 boys and 190 girls from kindergarten 2 to Primary Grade 6, in the school year 2022. The vocational backgrounds of parents are mainly laborers and farmers. There are 20 teachers and 2 janitors.

2) The School Administrative System:

The school principle is administering the school under the supervision of the Office of Primary Education Area Office, Phitsanulok No.1 which is headed by the school principal who has been appointed by the Office of Basic Education Commission (OBEC), the Ministry of Education. There is a school committee called “Kana Kammakarn Satharnsuksa” whose main duties are to consult the school development plan and support the school in any possible matters.

3) The Learning Contents and Actual Practices of Food Education

Using the 7 elements of Food and Nutrition Education (Shokuiku) as the framework for surveying learning contents and actual practices of Food Education in the school lunch project of Ban Krang School, answered by the school principal and the head teacher of school lunch project, the findings are shown in Table 5 below.

Table 5 The learning contents and actual practices of Food Education in School No.1

No.	Shokuiku Element	Evidence of Learning Contents or Actual Practices
1	Sustaining proper nutrition	Yes. From interview answers shown in the questionnaire, Pages 82-83
2	Fostering understanding, decision-making, and eating habits	Yes. From the contents of health education taught as a subject and the counseling during lunch hours.
3	Encouraging social & considerate spirit	Yes. From the contents of moral education as a sub-learning area and the counseling during lunch hours.
4	Furthering respect for life & nature and spirit of environmental conservation	Yes. From the contents of civic education as a sub-learning area and the home-room counseling.
5	Acknowledging about food industry and people’s hard work which should	Yes. From the contents of civic education as a sub-learning area and

	be respected	the home-room counseling.
6	Understanding about traditional, regional and local cuisine	Yes. From the contents of career education classes and counseling during school lunch hours.
7	Understanding of food production, transportation, and consumption	Yes. From the contents of civic education as a sub-learning area.

From Table 5, the 7 elements of Shokuiku are also practiced during school lunch hours or taught as required content in some subjects/learning areas at School No.1 in Phitsanulok.

4) The School Lunch Project Management

Using the P-D-C-A Process (Planning, Doing, Checking, Acting) as the scope for surveying school lunch project management, the findings are as shown in Table 6 below.

Table 6 The Managerial Process of School Lunch Project at School No.1

Process	Requirement (s)	Actual Practices
Planning	Regulations & orders of the Ministry of Education and the Ministry of Interior require participatory planning of school administrators, teachers, public health officers in the community, and parents. The school lunch plan must comply with all legal requirements.	The school lunch project is planned by the school committee which includes parents, educational experts, and community people. The budgeting plan is approved by the Primary Education Area 1 of Phitsanulok and OBEC before each fiscal year starts on October 1. The decisions are to hire cooks to prepare lunch, and to select the menu as suggested on the Website: Schoollunch.org ., and to follow the

		instruction plan of each school year that is prepared before the first semester starts in May.
Doing	The school lunch project manager is responsible for the implementation of the school lunch plan.	The Head teacher is appointed by the school principal to manage the school lunch project. There is no nutritional teacher. No extra-budgetary support comes from the community people.
Checking	Regular and systematic reports to the Ministry of Education and the Ministry of Public Health are needed.	Class teachers are responsible for daily checking and reporting the practices of children related to school lunch, health, and nutritional conditions.
Acting	Improving of health and nutritional conditions of the school children is to be considered by the school lunch committee of each school.	Parents are requested to improve their children's lunch habits if the school finds any problems related to children's health and nutrition.

From Table 6, the PDCA process of school lunch project management at School No.1 is mandated by the regulations and orders of the Ministry of Education, the Ministry of Interior, and the Ministry of Public Health. There is no requirement for nutritional teachers. This school hires cooks from the community and selects menus from the website of the School Lunch Project Fund Bureau.

2. About the School No.2 (Ban Nong Prue School)

1) The Context:

Geographically, the school is located in Wangthong District of Phitsanulok Province. The school community is rural, with farms and orchards around. There are no supermarkets nearby, and the people rely mostly on their farm products for their living.

The school serves a total number of 181 children, 91 boys and 90 girls from kindergarten 1 to Primary Grade 6, in the school year 2022. The vocational backgrounds of parents are mainly farmers. There are 10 teachers and 1 janitor.

2) The School Administrative System:

The school principle is administering the school under the supervision of the Office of Primary Education Area Office, Phitsanulok No.2 which is headed by the school principal who has been appointed by the Office of Basic Education Commission (OBEC), the Ministry of Education. There is a school committee called “Kana Kammakarn Satharnsuksa” whose main duties are to consult the school development plan and help support the school in any possible matters.

3) The Learning Contents and Actual Practices of Food Education

Using the 7 elements of Food and Nutrition Education (Shokuiku) as the framework for surveying of learning contents and actual practices of Food Education in school lunch project of Ban Nong Prue School. answered by the school principal and the head teacher in school lunch project, the findings are shown in Table 7 below.

Table 7 The learning contents and actual practices of Food Education in School No.2

No.	Shokuiku Element	Evidences of Learning Contents or Actual Practices
1	Sustaining proper nutrition	Yes. From interview answers shown in the questionnaire, Page 83-84
2	Fostering understanding, decision-making, and eating habits	Yes. From the contents of health education taught as a subject and the counseling during lunch hours.
3	Encouraging social & considerate spirit	Yes. From the contents of moral education as a sub-learning area and

		the counseling during lunch hours.
4	Furthering respect for life & nature and the spirit of environmental conservation	Yes. From the contents of civic education as a sub-learning area and the home-room counseling.
5	Acknowledging about food industry and people's hard work which should be respected	Yes. From the contents of civic education as a sub-learning area and the home-room counseling.
6	Understanding about traditional, regional and local cuisine	Yes. From the contents of career education classes and counseling during school lunch hours.
7	Understanding of food production, transportation, and consumption	Yes. From the contents of civic education as a sub-learning area.

From Table 7, the 7 elements of Shokuiku are also practiced during school lunch hours or taught as required contents in some subjects/learning areas at School No.2 in Phitsanulok.

4) The School Lunch Project Management

Using the P-D-C-A Process (Planning, Doing, Checking, Acting) as the scope for surveying school lunch project management, the findings are as shown in Table 8 below.

Table 8 The Managerial Process of School Lunch Project at School No.2

Process	Requirement (s)	Actual Practices
Planning	Regulations & orders of the Ministry of Education and the Ministry of Interior require participatory planning of school administrators, teachers, public health officers in the community, and parents. The	The school lunch project is planned by the school committee which includes parents, educational experts, and community people. The budgeting plan is approved by the Primary Education Area 1 of Phitsanulok and OBEC before each

	school lunch plan must comply with all legal requirements.	fiscal year starts on October 1. The decisions are to hire cooks to prepare lunch, and to select the menu as suggested on the Website: Schoollunch.org., and to follow the instruction plan of each school year that is prepared before the first semester starts in May.
Doing	The school lunch project manager is responsible for the implementation of the school lunch plan.	The Head teacher is appointed by the school principal to manage the school lunch project. There is no nutritional teacher. No extra-budgetary support comes from the community people.
Checking	Regular and systematic reports to the Ministry of Education and the Ministry of Public Health are needed.	Class teachers are responsible for daily checking and reporting the practices of children related to school lunch, health, and nutritional conditions.
Acting	Improving of health and nutritional conditions of the school children is to be considered by the school lunch committee of each school.	Parents are requested to improve their children's lunch habits if the school finds any problems related to children's health and nutrition.

From Table 8, the PDCA process of school lunch project management at School No.2 is mandated by the regulations and orders of the Ministry of Education, the Ministry of Interior, and the Ministry of Public Health. There is no requirement for nutritional teachers. This school hires cooks from the community and selects menus from the website of the School Lunch Project Fund Bureau.

3. About the School No.3 (Wat Senat School)

1) The Context:

Geographically, the school is located in Watbot District of Phitsanulok Province. The school community is semi-rural, with a big village and farms. There are a few groceries nearby, and the people rely mostly on laboring and farming for their living.

The school serves a total number of 180 children, 95 boys and 85 girls from kindergarten 1 to Grade 9 (primary and lower secondary), in the school year 2022. The vocational backgrounds of parents are mainly labors and farmers. There are 17 teachers.

2) The School Administrative System:

The school principle is administering the school under the supervision of the Office of Primary Education Area Office, Phitsanulok No.3 which is headed by the school principal who has been appointed by the Office of Basic Education Commission (OBEC), the Ministry of Education. There is a school committee called “Kana Kammakarn Satharnsuksa” whose main duties are to consult the school development plan and help support the school in any possible matters.

3) The Learning Contents and Actual Practices of Food Education

Using the 7 elements of Food and Nutrition Education (Shokuiku) as the framework for surveying learning contents and actual practices of Food Education in school lunch project of Wat Senat School. answered by the school principal and the head teacher of school lunch project, the findings are shown in Table 9 below.

Table 9: The learning contents and actual practices of Food Education in School No.3

No.	Shokuiku Element	Evidences of Learning Contents or Actual Practices
1	Sustaining proper nutrition	Yes. From interview answers shown in the questionnaire, Pages 84-85

2	Fostering understanding, decision-making and eating habits	Yes. From the contents of health education taught as a subject and the counseling during lunch hours.
3	Encouraging social & considerate spirit	Yes. From the contents of moral education as a sub-learning area and the counseling during lunch hours.
4	Furthering respect of life & nature and spirit of environmental conservation	Yes. From the contents of civic education as a sub-learning area and the home-room counseling.
5	Acknowledging about food industry and people's hard work which should be respected	Yes. From the contents of civic education as a sub-learning area and the home-room counseling.
6	Understanding about traditional, regional and local cuisine	Yes. From the contents of career education classes and counseling during school lunch hours.
7	Understanding of food production, transportation, and consumption	Yes. From the contents of civic education as a sub-learning area., as also in science Education related to Chemistry.

From Table 9, the 7 elements of Shokuiku are also practiced during school lunch hours or taught as required contents in some subjects / learning areas at School No.3 in Phitsanulok.

4) The School Lunch Project Management

Using the P-D-C-A Process (Planning, Doing, Checking, Acting) as the scope for surveying school lunch project management, the findings are as shown in Table 10 below.

Table 10 The Managerial Process of School lunch project at School No.3

Process	Requirement (s)	Actual Practices
---------	-----------------	------------------

Planning	Regulations & orders of the Ministry of Education and the Ministry of Interior require participatory planning of school administrators, teachers, public health officers in the community, and parents. The school lunch plan must comply with all legal requirements.	The school lunch project is planned by the school committee which includes parents, educational experts, and community people. The budgeting plan is approved by the Primary Education Area 1 of Phitsanulok and OBEC before each fiscal year starts on October 1. The decisions are to hire cooks to prepare lunch, to select the menu as suggested on the Website: Schoollunch.org., and to follow the instruction plan of each school year that is prepared before the first semester starts in May.
Doing	The school lunch project manager is responsible for the implementation of the school lunch plan.	The Head teacher is appointed by the school principal to manage the school lunch project. There is no nutritional teacher. No extra-budgetary support comes from the community people.
Checking	Regular and systematic reports to the Ministry of Education and the Ministry of Public Health are needed.	Class teachers are responsible for daily checking and reporting the practices of children related to school lunch, health, and nutritional conditions.
Acting	Improving of health and nutritional conditions of the school children is to be considered by the school lunch committee of each school.	Parents are requested to improve their children's lunch habits if the school finds any problems related to children's health and nutrition.

From Table 10, the PDCA process of school lunch project management at School No.3 is mandated by the regulations and orders of the Ministry of Education, the Ministry of Interior, and the Ministry of Public Health. There is no requirement for nutritional teachers. This school hires cooks from the community, and selects menus from the website of the School Lunch Project Fund Bureau.



CHAPTER FIVE

CONCLUSION, DISCUSSION AND SUGGESTION

1. Conclusion

To explore and compare the historical development of Food and Nutrition Education in school lunch projects of primary schools in Japan and Thailand, and to survey the actual states of Food and Nutrition Education in selected primary schools in Phitsanulok Province, the qualitative methods are employed and the findings are as summarized below.

1.1. The Historical Development of Food and Nutrition Education in Japan and Thailand and Current Conditions

Through the comparative approach, this study has employed a documentary analysis of texts and previous studies in Thai, English, and Japanese languages and described the analyzed contents and classified them in chronological order. The analysis focused on the forces and the factors responsible for the noted differences. The findings are as follows:

1.1.1 Emergence of the School Lunch Projects in Primary Schools:

In Japan, it began in 1889 as a food service for the poor. The menu was a rice ball. After Japan defeated in World War II, it was provided to achieve smooth reconstruction and reborn with bread and skim milk by SCAP of US and international aid. But, in Thailand, it began 60 years later, in 1952, also focused on the poor, but did not mention about the type of special food.

1.1.2 School Lunch Projects after World War II to early 21st Century:

In Japan, the role changed to improve the physical health and learn appropriate dietary habits and manner in school children. The expansion and quality improvement started in 1950. The school lunch project became a part of School Events, and then a part of Special

Activities to provide for character education as well. From 1970 to end of the 20th century, rice-based meals and qualified nutritionists were required. The Ministry of Agriculture, Forestry and Fisheries began its interventions. In Thailand, 40 years after the emergence of school lunch project for the poor, the support for all primary school children began by law in 1992. The amount of subsidy was very small and it increased very slowly.

1.1.3 Food and Nutrition Education in School Lunch Project of the 21st Century:

In Japan: “Food and Nutrition Education”, or Shokuiku, is positioned as the basis of human life. School lunch project is an approach to promote “Food and Nutrition Education” as provided by law since 2005. In Thailand, although the School Lunch Project Fund Bureau was established in 1992, the term “Food Education” did not legally exist until January 2008. While Japan used privately practiced Shokuiku since the Edo era, Thailand legally practiced National Healthy Codes. At present, there are some differences dealing with the Food and Nutrition Education of the two countries, especially the requirement for nutritional teachers, the focus on eating breakfast and balanced meals, and the focus on integration of food production activities in the school lunch projects.

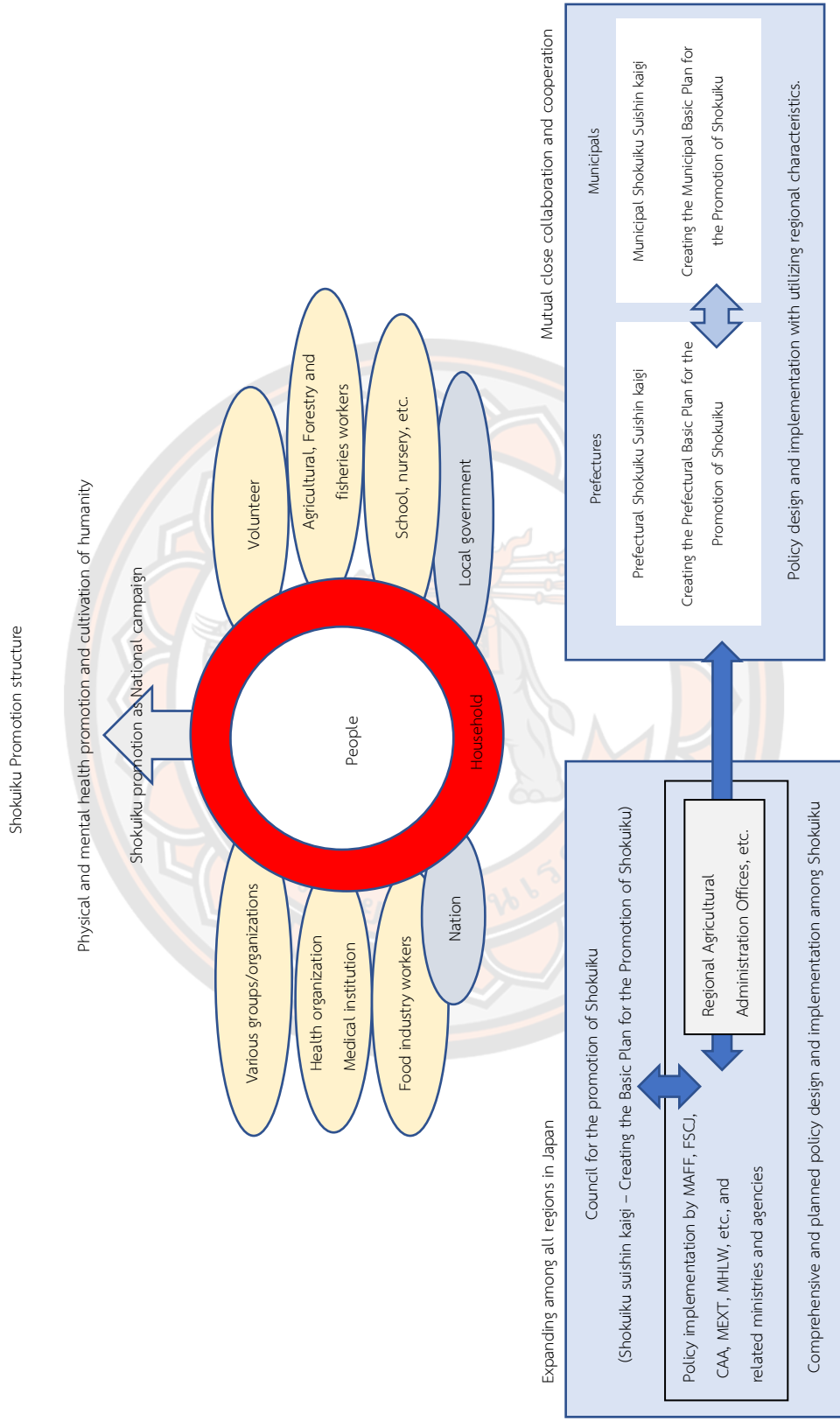


Figure 8: Shokuiku Promotion Structure. Source: Ministry of Agriculture and Forestry and Fisheries. 3 Promotion Structure of Shokuiku policy Measures (3 Shokuiku ni kan suru shisaku no suisshin taiset) Retrieved February 03 2023, from

https://www.maff.go.jp/syokuiku/wpaper/h29_t29_tbook/part04_0_0_03.html Abbreviation: FSCJ (Food Safety Commission Japan)

1.2. Forces and Factors Responsible for the Differences:

1.2.1 The forces of change to the objectives of school lunch project towards “Food and Nutrition Education” in Japan came from the Act for Food and Nutrition Education in 2005. The forces of change to add “food education” in school lunch projects of primary schools in Thailand came from the Act for National Food Committee, enforced in 2008.

1.2.2 The administrative system affecting Shokuiku or Food and Nutrition Education in Japan started in 2005 when the Cabinet Office (CAO) took responsibility. Then, in 2016, the responsibility for planning of Basic Plan for Shokuiku was transferred to the Ministry of Agriculture, Forestry and Fisheries (MAFF). After that, three ministries and several other organizations are responsible for Shokuiku, under CAO; MEXT for the course of study, diet and nutrition teachers, school lunch project, and Food and Nutrition Education; MAFF for food safety and consumer affairs, Food and Nutrition Education evaluation, and regional agricultural administration. MHLW and the others are in the National Food and Nutrition Education Committee. Each prefectural Board of Education manages Shokuiku in schools under its jurisdiction. The national campaign is held at the upper level; while people including volunteers promote physical and mental health under the comprehensive system of administration.

In Thailand, the administration of Food Education in school Lunch Projects is responsible for each school to meet the standards set by the School lunch project Fund Committee to receive the school lunch promotion budget as a subsidy.

The inputs affect Shokuiku in Japan are more carefully provided; while those for Food Education in primary schools in Thailand are less comprehensively provided, especially concerning food and nutritional teachers and the guidelines for

management of Food and Nutrition Education. Another major different point is related to the objectives of Shokuiku cover also the socio-cultural and environmental aspects including the promotion of regional and local cuisine and the understanding of food production and consumption; while the 10 measures for school lunch projects in primary schools of Thailand only focus on having enough food to eat and managerial aspects of the school lunch projects.

The management process affects Shokuiku in Japan is based on Total Quality Management (TQM) which the participation of all stakeholders starts from the top level down to the school level. In Thailand, the TQM is emphasized in the school level, but not so clearly emphasized in the upper level.

1.3. A Case Study of Three Primary Schools in Phitsanulok

Three schools are purposively selected, one each from those under the jurisdiction of Phitsanulok Primary Education Area 1, Area 2, and Area 3. Thus School No. 1 is located in a semi-urban community, while School No.2 and School No. 3 are outside of urban areas. Thus, there are a few convenient stores and food vendors near School No.1 and School No.3 where the school children buy snacks and sweets on the way to school, and even after lunch. The most remote school is School No.2, where there are no convenient stores around, thus the children rely totally on school lunch and supplementary milk provided freely by the school.

The school sizes and class levels differ among the three. School No.1 provides for kindergarten 2-3 and Primary 1-6, with medium size. School No.2 provides for kindergarten 2-3, Primary 1-6, and Lower Secondary 1-3, with medium size. School No.3 provides for kindergarten 2-3, Primary 1-6, and Lower Secondary 1-3, with small size.

The communities around the three schools are different. Around School No.1, as well as around School No.3, the communities support the

schools are largely composed of parents who cannot afford to send children to elite schools in the city which is not very far away.

The administrative systems of the three schools are similar. The principal of each school administers under the supervision of the Primary Education Area Office of Phitsanulok Area 1, 2, or 3 which is under the Office of Basic Education Commission (OBEC), the Ministry of Education.

Using the 7 elements of Food and Nutrition Education (Shokuiku) as the framework for surveying learning contents and actual practices of Food Education in school lunch project of the three selected schools, the findings reveal the 7 elements of Shokuiku are also practiced during school lunch hours or taught in some subjects/learning areas at School No.1, 2 and 3 in Phitsanulok.

The PDCA process of school lunch project management is mandated by the Ministry of Education, the Ministry of Interior, and the Ministry of Public Health. There is no requirement for nutritional teachers. All the three schools hire cooks from the communities, and select menus from the website of the School Lunch Project Fund Bureau. People in the community of School No.2 which is in a farming area donated rice grains enough to feed breakfast to all children in the previous school year.

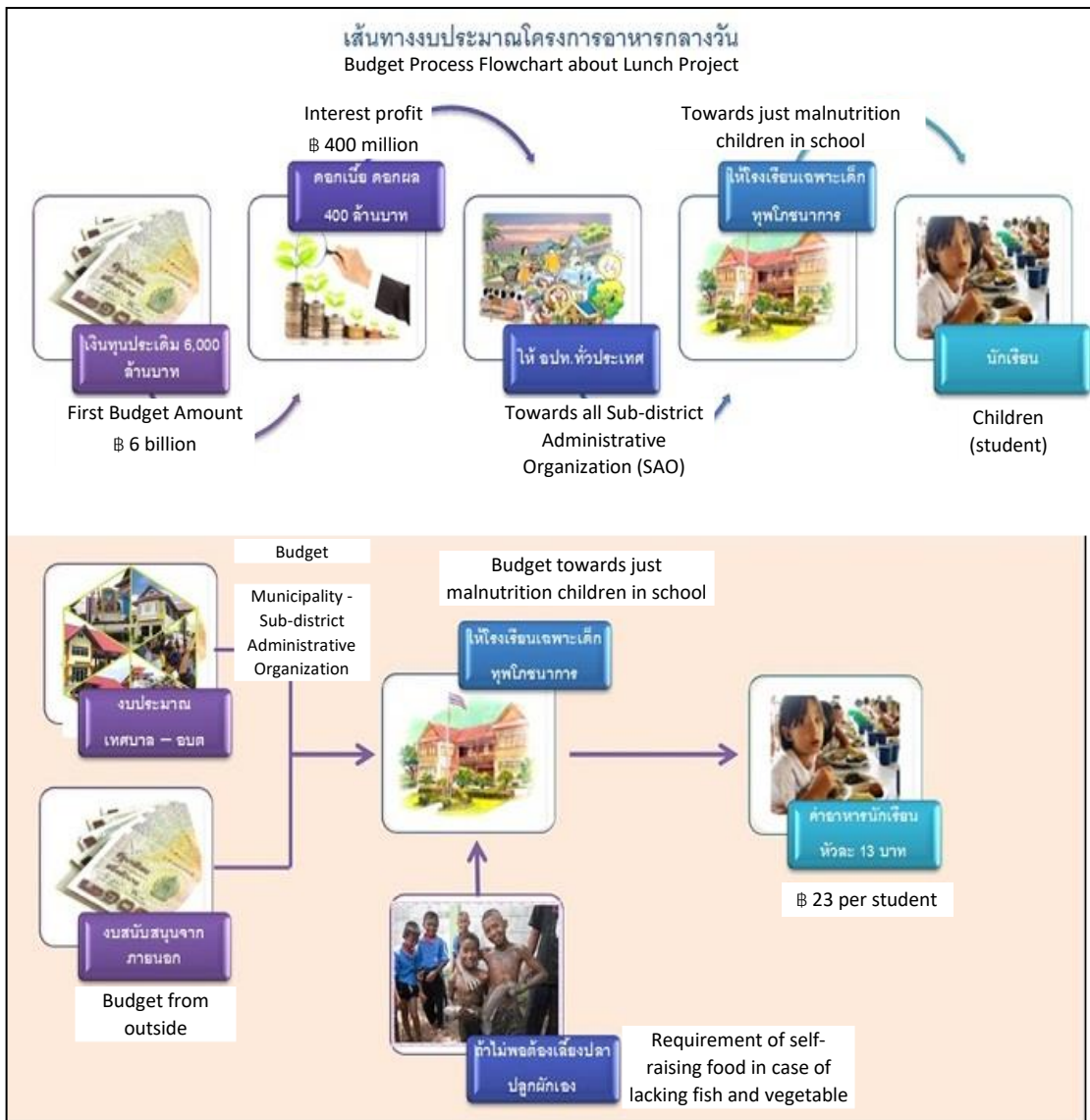


Figure 9: Budget Process Flowchart about Lunch Project

Source: 'งบโครงการอาหารกลางวัน' ใกล้เคียงเปิดเทอม-แต่เงินยังไม่ถึง 'โรงเรียน' คลังประเมิน 4 ด้านไม่ผ่านเกณฑ์มาแล้ว 3 ปี Retrieved February 03 2023, from <https://www.tcijthai.com/news/2015/12/scoop/1102>

2. Discussion

2.1 It seems the emergence of school lunch project in primary schools in Japan was earlier than in Thailand. The Meiji Restoration reformed compulsory education, which was very ambitious, while the compulsory education of Thailand was more or less voluntarily supported by Buddhist temples. Another possible factors might arise from the nature of temple schools in Thai villages in the period; the humble schools where food from forests, streams, and surrounding rice fields was relatively plenty. After the end of World War II, the educational systems of both countries were influenced by the United States, so the ideas of school lunch project of American schools were adopted in both countries, but Japan was more advanced in the integration of her traditional character education and moral education into the school lunch project. Again, in the adaptation of Food and Nutrition Education, following the Sustainable Development Goals of the UN towards “Zero Hunger” both countries started developing the school lunch projects towards “Food Education/Food and Nutrition Education” only three years apart. Both countries are trying to do their best, based on their own historical and socio-economic backgrounds. Thailand seems to struggle more, while Japan is being evaluated as highly successful by most food and nutritious educators.

2.2 The survey of the three selected primary schools in Phitsanulok revealed 2 out of 3 schools are surrounded by convenience stores and food vendors where children often buy snacks and sweets on the way to school and after lunch. Although the school sizes and class levels differ among the three, the communities support the schools are largely composed of parents who cannot afford to send children to elite schools in the city which is not very far away from School No.1 and School No.3, but very far away from School No.2. The administrative system of the three schools is similar.

The 7 elements of Shokuiku are also practiced during school lunch hours or being taught in some subjects/learning areas at School

No.1, 2, and 3 in Phitsanulok; but Element No.1 is mostly taught and practiced in the school lunch period. The other elements (Elements No.2-7 of Shokuiku) are integrated in related subjects or counseling activities. The PDCA process of school lunch project management is mandated by the Ministry of Education, the Ministry of Interior, and the Ministry of Public health. There is no requirement for nutritional teachers. All the three schools hire cooks from the communities, and select menus from the website of the School Lunch Project Fund Bureau. People in the community of School No.2 which is in a farming area donated rice grains enough to feed breakfast to all children in the previous school year.

The findings from this survey revealed many elements of Food and Nutrition Education in Japan are not much recognized in the school lunch projects of the primary schools for the case study. Though the provision of sample menus is found, it is only broadly prescribed. When examining more closely the contents of Guidelines for Shokuiku of Japan and other guidebooks provided by MAFF and local organizations in Japan, there are many other aspects to be considered if the improvement of Food Education in school lunch projects of primary schools in Thailand is targeting towards the Zero Hunger Goal.

3. Suggestion

3.1 Suggestion for Application of the Research Findings

3.1.1 Food and Nutrition Education with TQM

It is clearly understood from this study which the development of Food and Nutrition Education of Japan is more progressed than Food Education in Thailand. In Japan, Food and Nutrition Education covers people as a whole, from birth to death, not only primary school children. The engagement in Food and Nutrition Education administration is highly comprehensive based on the principles of Total Quality Management. Thus, it is suggested the seven elements of Food and Nutrition Education in Japan shall be recognized by food educators of Thailand, and they should be further applied in school

lunch projects and Food Education in primary schools of this country as quickly as possible.

3.1.2 Sorting out of School Lunch Project

We should sort out school lunch project three types from the view of school feeding as (i) school feeding by post-war regime and international aid against undernutrition after World War II, (ii) school feeding to keep good health, (iii) school feeding against the double burden of malnutrition as an emerging topic. Now, the post-war regime is regarded as a legacy. And nutrition transition, double burden of malnutrition, food insecurity, food crisis, and the ten billion world population era are becoming major problems in the world. In addition, as more marketing develops, more people have to take measures against the environment such as advertising, purchasing methods, sophisticated platforms, etc., in the social feeding process in food security. School feeding began with the post-war regime of Allied powers as a coordinator of reconstruction with effective use of world resources, has worth only if it relates to religious, monotheism scriptures or ideology which share suffering, fulfillment, and purpose in life.

3.1.3 Should the School Lunch Project for Overnutrition and Double burden of Malnutrition be called a School Lunch Project?

First of all, there was no school lunch project against overnutrition or the double burden of malnutrition in the world. Should the school lunch project for the high rate of obesity and high rate of double burden of malnutrition be called a school lunch project? That kind of school lunch project is off the historical context in the world. And, scaling up policy among school lunch projects, school lunch project implementation rate and school attendance rate can't be regarded as good outcomes of school lunch projects. Assumptions of children's behaviour in school feeding and people's behaviour in social feeding are not only based on health careers but also cultural assets in

the Food and Nutrition Education in Japan. Sometimes, children and people must show evidence which people can present cultural assets as Japanese through social feeding. Next, they create, eat, become a part of the divine arts of Washoku world. Because the traditional food culture of Japanese (T. W. A. o. Japan) has been created to present fare for the superior existence. Without the thought, there would be neither a school lunch project nor Food and Nutrition Education in Japan. Feeding and eating isn't a set but feeding and children is a set.

3.1.4 Amsterdam Initiative against Malnutrition (AIM)

For welcoming the ten billion world population era in the middle of 21st century, the example of Amsterdam Initiative against Malnutrition (AIM) is helpful. According to P. M. s. O. o. Japan (2015), AIM advances improvement of nutritional intake and overseas expansion. They adopt Market-Based Approach (MBA) and sustainable support. The GDP of emerging countries is already larger than developed countries. Japan was a donor country though her low self-sufficiency rate. Now, she should reconsider the role of the world as she protects post-war regime legacy and history.

3.2 Suggestion for Further Study

The survey of the selected schools is not enough to represent the current status of Food Education in primary schools in Thailand. Therefore, it is suggested further studies shall be conducted with deeper considerations on the seven elements of Shokuiku.



APPENDICES

มหาวิทยาลัยนครพนม

ABBREVIATIONS

CAA	=	Consumer Affairs Agency
CAO	=	Cabinet Office
GARIOA	=	Government Appropriation for Relief in Occupied Areas Fund
FAO	=	Food and Agriculture Organization of the United Nations
FSCJ	=	Food Safety Commission Japan
GHQ	=	Government Headquarter
LAO	=	Local Administrative Organization
MAFF	=	Ministry of Agriculture, Forestry and Fisheries
MEXT	=	Ministry of Education, Culture, Sports Science and Technology
MHLW	=	Ministry of Health, Labour and Welfare
MOJ	=	Ministry of Justice
MDGs	=	Millennium Development Goals
NIER	=	National Institute for Educational Policy Research
ONPEC	=	Office of National Primary Education Commission
OBEC	=	Office of the Basic Education Commission
PEO	=	Primary Education Office
SAO	=	Sub-district Administrative Organization
SDGs	=	Sustainable Development Goals
SCAP	=	Supreme Commander for Allied Powers
TQM	=	Total Quality Management
UN	=	United Nations
UNESCO	=	United Nations Educational, Scientific and Cultural Organization
WFS	=	World Food Summit
WFP	=	World Food Program

APPENDIX A
GUIDELINES FOR SCHOOL LUNCH PROJECT IN PRIMARY SCHOOLS OF THAILAND

1. Guidelines for the Management of School Lunch Fund Project in School
(Published: 1 November 2017, updated 26 April 2018)



http://www.obecschoollunch.com/download/manual_lunch/

2. Guideline for School lunch project Management for Primary Schools
In Conformity with the Standards for Nutrition, Food Hygiene, and Food Safety
(Published: 1 November 2017, updated 26 April 2018)



http://www.obecschoollunch.com/download/manual_lunch1/

3. Lesson 4 Techniques for Developing the Desirable Nutritious Behaviours and Healthy Habits (Published: 1 November 2017, updated 26 April 2018)



<http://www.obecschoollunch.com/download/behavior/>

4. Suggested Automatic Lunch Menu for Schools, Thai School Lunch
(Published: 26 April 2018, updated 26 April 2018)



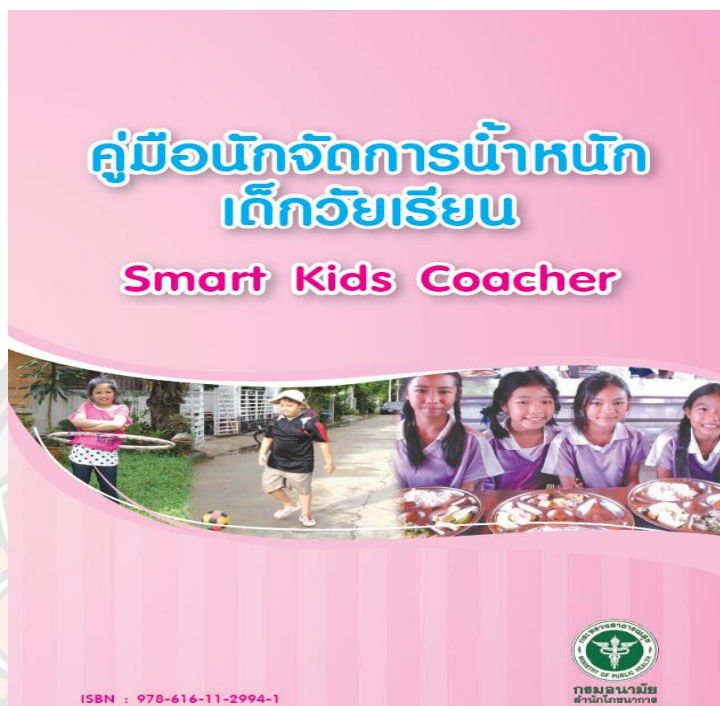
<http://www.obecschoollunch.com/download/thai-school-lunch-manual/>

5. Guidelines for Lunch Setting “School Children”
(Published: 26 April 2018, updated 26 April 2018)



http://www.obecschoollunch.com/download/lunch_child/

6. Guidelines for Weight Coacher of School Children, “Smart Kids Coacher”
(Published: 26 April 2018, updated 26 April 2018)



http://www.obecschoollunch.com/download/fat_child/

7. Guidelines for Evaluation of Water Resource Development Project and the Effects to Health, “Understand Weight and Height”
(Published: 21 February, updated 26 April 2018)



<http://www.obecschoollunch.com/download/weight/>

8. Guidelines for Classification of Food, Dessert, Milk, and Drink in Accordance with the Revised Nutritious Standards for Kids Aged 3-15 Years. (Published: 9 March 2018, updated 26 April 2018)



<http://www.obecschoollunch.com/download/คู่มือจำแนกอาหาร-ขนม-นมแม่/>

9. “Rainbow-Color Vegetables”
(Published: 9 March 2018, updated 26 April 2018)



<http://www.obecschoollunch.com/download/ผักผลไม้สีรุ้ง/>

10. “Hygienic Cook with Loving Heart for Kids”
(Published: 9 March 2018, updated 26 April 2018)



<http://www.obecschoollunch.com/download/cook/>

APPENDIX B
QUESTIONNAIRES AND DATA COLLECTION INSTRUMENTS

Ban Krang School Answers to the Questionnaire. Date of Data Collection: 2022 November 15.		
No.	Items	Current status
1	Is your school in or outside of urban area?	<input checked="" type="checkbox"/> Urban <input type="checkbox"/> Outside of urban
2	What is the average income status of your school children's parents?	<input type="checkbox"/> High <input type="checkbox"/> Average <input checked="" type="checkbox"/> Low
3	Are there practices related to measuring and recording school children's weight and height?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
4	Are there any teaching contents or actual practices related to food and nutrition?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
5	Are there any teaching contents or actual Practices related to danger of salty snacks, sugar, and sweets?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
6	Are there any teaching contents or actual practices related to danger of high fat food?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
7	Are there any teaching contents or actual practices related to food that causes cancer?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
8	Are there any teaching contents or actual practices related to acknowledgement of food production date and expiration date?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
9	Are there any teaching contents or actual practices related to nutrition facts (energy, sugar, protein, etc.) on food packages?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
10	Are there any teaching contents or actual practices related to nutritional problems?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
11	Are there any teaching contents or actual practices related to proper nutrition required in each age?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
12	Are there any teaching contents or actual practices related to boiled food as a style of healthy cooking?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
13	Are there any teaching contents or actual practices related to 30 – 40 minutes of physical exercise daily routine?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
14	Are there any teaching contents or actual practices related to the differences between cultivated and wild vegetables?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

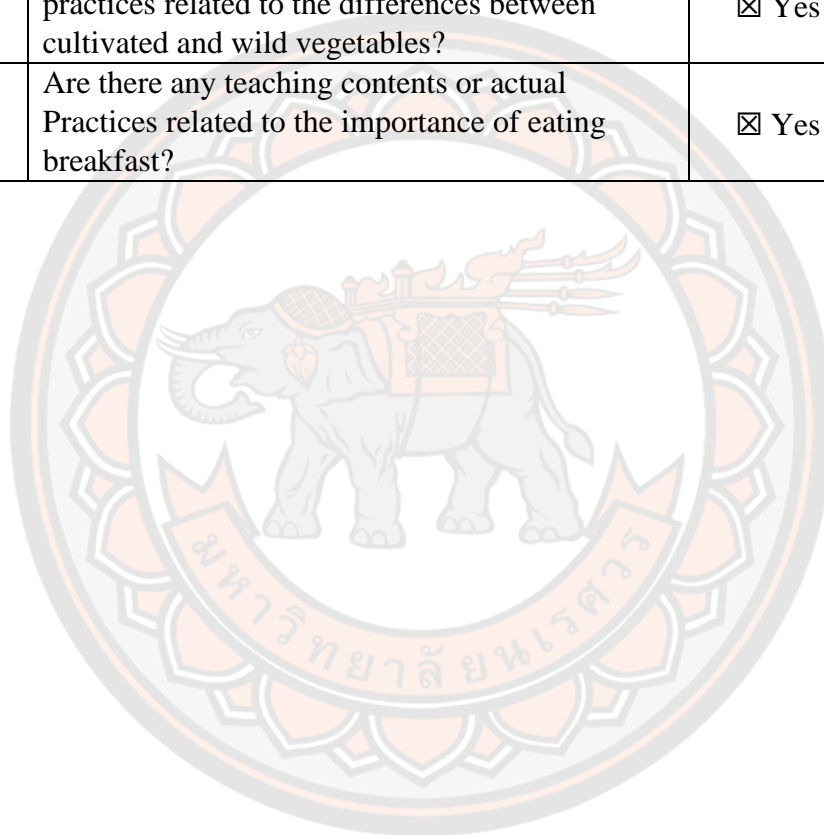
15	Are there any teaching contents or actual Practices related to the importance of eating breakfast?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
----	--	---

Ban Nong Prue School Answers to the Questionnaire. Date of Data Collection: 2022 November 15.		
No.	Items	Current status
1	Is your school in or outside of urban area?	<input type="checkbox"/> Urban <input checked="" type="checkbox"/> Outside of urban
2	What is the average income status of your school children's parents?	<input type="checkbox"/> High <input type="checkbox"/> Average <input checked="" type="checkbox"/> Low
3	Are there practices related to measuring and recording school children's weight and height?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
4	Are there any teaching contents or actual practices related to food and nutrition?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
5	Are there any teaching contents or actual Practices related to danger of salty snacks, sugar, and sweets?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
6	Are there any teaching contents or actual practices related to danger of high fat food?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
7	Are there any teaching contents or actual practices related to food that causes cancer?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
8	Are there any teaching contents or actual practices related to acknowledgement of food production date and expiration date?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
9	Are there any teaching contents or actual practices related to nutrition facts (energy, sugar, protein, etc.) on food packages?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
10	Are there any teaching contents or actual practices related to nutritional problems?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
11	Are there any teaching contents or actual practices related to proper nutrition required in each age?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
12	Are there any teaching contents or actual practices related to boiled food as a style of	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

	healthy cooking?	
13	Are there any teaching contents or actual practices related to 30 – 40 minutes of physical exercise daily routine?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
14	Are there any teaching contents or actual practices related to the differences between cultivated and wild vegetables?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
15	Are there any teaching contents or actual Practices related to the importance of eating breakfast?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Wat Senat School Answers to the Questionnaire. Date of Data Collection: 2022 November 15.		
No.	Items	Current status
1	Is your school in or outside of urban area?	<input type="checkbox"/> Urban <input checked="" type="checkbox"/> Outside of urban
2	What is the average income status of your school children's parents?	<input type="checkbox"/> High <input type="checkbox"/> Average <input checked="" type="checkbox"/> Low
3	Are there practices related to measuring and recording school children's weight and height?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
4	Are there any teaching contents or actual practices related to food and nutrition?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
5	Are there any teaching contents or actual Practices related to danger of salty snacks, sugar, and sweets?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
6	Are there any teaching contents or actual practices related to danger of high fat food?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
7	Are there any teaching contents or actual practices related to food that causes cancer?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
8	Are there any teaching contents or actual practices related to acknowledgement of food production date and expiration date?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
9	Are there any teaching contents or actual practices related to nutrition facts (energy, sugar, protein, etc.) on food packages?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
10	Are there any teaching contents or actual practices related to nutritional problems?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

11	Are there any teaching contents or actual practices related to proper nutrition required in each age?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
12	Are there any teaching contents or actual practices related to boiled food as a style of healthy cooking?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
13	Are there any teaching contents or actual practices related to 30 – 40 minutes of physical exercise daily routine?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
14	Are there any teaching contents or actual practices related to the differences between cultivated and wild vegetables?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
15	Are there any teaching contents or actual Practices related to the importance of eating breakfast?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No



APPENDIX C
1. About the School No.1 (Ban Krang School)



L → R : Dr.Chantana, Dr.Varinthorn, School Principal

2. About the School No.2 (Ban Nong Prue School)



L → R : School Principal, Dr.Chantana, Dr.Varinthorn



School Kitchen Inside
(Ban Nong Prue School)



School Kitchen Outside
(Ban Nong Prue School)

3. About the School No.3 (Wat Senat School)



L → R : School Principal, Dr.Chantana, Dr.Varinthorn

Appendix D
GUIDELINES FOR SCHOOL LUNCH PROJECT IN PRIMARY SCHOOLS
OF JAPAN

1. Training Manual for cooks of school lunch
(Open to the public: June 2012)



https://www.mext.go.jp/a_menu/sports/syokuiku/1321861.htm

2. Manual of hygiene management & Cooking skill in cooking area
(Open to the public: June 2011)



https://www.mext.go.jp/a_menu/sports/syokuiku/1306690.htm

3. Practical lesson cases about food by diet and nutrition teacher
(Open to the public: Before 2009)



https://www.mext.go.jp/a_menu/sports/syokuiku/1281570.htm

BIBLIOGRAPHY

- Aoki, K. (2014). Seikatsu shūkan no henka to shippei kouzou, Aoki heihachirou kinen yobou igaku kouhou jigyoudan. Retrieved from https://www.hosp.mie-u.ac.jp/epidemiology/_src/1434/AokiVol3_pc.pdf
- Barilla Food Center for Nutrition Foundation. (2017). Japan shows food education works. Retrieved from https://medium.com/@BCFN_Foundation/japan-shows-food-education-works-6b7aa32cb809
- Camponotes.com. (2013). METHODOLOGICAL APPROACHES IN COMPARATIVE EDUCATION. [Web log post]. Retrieved from <http://camponotes.blogspot.com/2013/01/methodological-approaches-in.html>
- Doustmohammadian, A., Omidvar, N., Keshavarz-Mohammadi, N., Abdollahi, M., Amini, M., & Eini-Zinab, H. (2017). Developing and validating a scale to measure Food and Nutrition Literacy (FNLIT) in elementary school children in Iran. *PLOS ONE*, 12(6), e0179196. doi:10.1371/journal.pone.0179196
- Durkheim, E. (1982). *The Rules of Sociological Method* (S. Lukes Ed.): Red Globe Press London.
- Harlan, C. (2013, 26 January 2013). On Japan's school lunch menu: A healthy meal, made from scratch. *The Washington Post*. Retrieved from https://www.washingtonpost.com/world/on-japans-school-lunch-menu-a-healthy-meal-made-from-scratch/2013/01/26/5f31d208-63a2-11e2-85f5-a8a9228e55e7_story.html
- Inoue, T. (2011). 「学校給食」とのかかわりから想うこと. *美味技術研究会誌*, 2011(17), 5-8. doi:10.11274/bimi2002.2011.17_5
- Iwasaki, M. (2009). Memories of "LARA" : Relief and Skimmed Milk Sent to Day-Care Centers After World War II . *Bulletin of Tokyo Kasei University Museum*, 14, 19-32. Retrieved from <http://id.nii.ac.jp/1653/00010295/>
- Japan, P. M. s. O. o. (2015). *Oranda AIM ni okeru eiyou kaizen no kokusai tenkai ni kansuru chousa houkou (gaiyou)*. Retrieved from https://www.kantei.go.jp/jp/singi/kenkouiryoku/kokusaitenkai/eiyou_dai2/bessi02.pdf
- Japan, T. W. A. o. (Producer). (2021, 28 June 2023). Murata bu kai chō kouen “nihon ryouri no kihon”. Retrieved from https://www.youtube.com/watch?v=-o7qbNmRQ_E
- Jumpatong, D. (2007). School Lunch Program and Rice Consumption Behavior in Thailand. Retrieved from <http://worldfood.apionet.or.jp/thai.pdf>
- Kondo, J. (2018). Senryō ki doitsu no shokuryō nan. *Bulletin of the Nanzan Center for European Studies*, 24, 13-49. doi:doi/10.15119/00001820
- Kubota, N. (2012). Changes of School Dietitian Jobs after World War II in Japan. *Hokkai-Gakuen University, the journal of economics*, 60(3), 99-146. Retrieved from <http://hokuga.hgu.jp/dspace/handle/123456789/2212>
- Lambers, W. (n.d.). We Could Take Humanitarian Lessons from Herbert Hoover. Retrieved from <https://historynewsnetwork.org/article/46560>

- Leite, S. (2014). Comparative Education as a tool for improvement. Retrieved from <https://educatinginternationally.wordpress.com/2014/04/22/comparative-education-as-a-tool-for-improvement/>
- Lumey, L. H., & Stein, A. D. (1997). In utero exposure to famine and subsequent fertility: The Dutch Famine Birth Cohort Study. *American Journal of Public Health*, 87(12), 1962-1966. doi:10.2105/ajph.87.12.1962
- MAFF. (2012). *A Guide to Shokuiku*. Retrieved from https://www.maff.go.jp/j/syokuiku/guide/pdf/00_en_guide.pdf
- MAFF. (2020). *01 Showwa kara reiwa made, nendai betsu ni miru gakkou kyuushoku no henshen*. Retrieved from <https://www.maff.go.jp/j/pr/aff/2006/food01.html>
- MAFF. (2022). *Reiwa 3 nendo Shokuiku hakusho*. Retrieved from https://www.maff.go.jp/j/syokuiku/wpaper/attach/pdf/r3_wpaper-23.pdf
- MEXT. (2008). *6 Kyougaku seishi to bunkyou seisaku no henka*. Retrieved from https://www.mext.go.jp/b_menu/hakusho/html/others/detail/1317585.htm
- MEXT. (2017). *Explanation about course of study (Special activity)*. Retrieved from https://www.mext.go.jp/content/20221213-mxt_kyoiku02-100002607_014.pdf
- Murai, G. (1913). *Kuidōraku aki no maki*. Tokyo, Japan: Hōchisha.
- Nakamura, T. (2022). History of Nutritional Improvement in Japan. In (pp. 29-60): Springer Singapore.
- NIER. (2013). *School Lunch Program in Japan*. Retrieved from <https://www.nier.go.jp/English/educationjapan/pdf/201303SLP.pdf>
- OBEC. (2022). แผนพัฒนากองทุน. Retrieved from <http://www.obecschoollunch.com/wp-content/uploads/2022/05/1.-%E0%B9%81%E0%B8%9C%E0%B8%99%E0%B8%9E%E0%B8%B1%E0%B8%92%E0%B8%99%E0%B8%B2-1.pdf>
- OBEC. (n.d.a). Education Management Information System : EMIS. Retrieved from https://data.bopp-obec.info/emis/school.php?Area_CODE=6501
- OBEC. (n.d.b). Education Management Information System : EMIS. Retrieved from https://data.bopp-obec.info/emis/school.php?Area_CODE=6502
- OBEC. (n.d.c). Education Management Information System : EMIS. Retrieved from https://data.bopp-obec.info/emis/school.php?Area_CODE=6503
- Petchoo, J., Kaewchutima, N., & Tangsuphoom, N. (2022). Nutritional quality of lunch meals and plate waste in school lunch programme in Southern Thailand. *Journal of Nutritional Science*, 11, e35. doi:10.1017/jns.2022.31
- Phitsanulok Primary Educational Service Area Office 1 (2018, 21 June 2018). Retrieved from <https://www.facebook.com/educationplk1/posts/1983894858347410/>
- Popkin, B. M. (2006). Global nutrition dynamics: the world is shifting rapidly toward a diet linked with noncommunicable diseases. *The American Journal of Clinical Nutrition*, 84(2), 289-298. doi:<https://doi.org/10.1093/ajcn/84.2.289>
- Rogers, P. (2017, 5 June 2017). Feeding Young Minds: The Importance of School Lunches. Retrieved from *The New York Times*. Retrieved from <https://www.nytimes.com/2017/06/05/well/feeding-young-minds-the-importance-of-school-lunches.html>
- Sasaki, H. E., Kunihiro. (2018). 医療・福祉の根本思想としての第 25 条成立の過程及びサムス PHW 局長による戦後の公衆衛生及び地域福祉改革に関

- する歴史検証. *Integrated studies in nursing science*, 1, 1-24. Retrieved from <http://id.nii.ac.jp/1827/00004675/>
- Sato, K. (2015). "nihon ni okeru gakkou kyuushoku" - shakai hendou to kyouiku teki kadai no shiten kara. Retrieved from http://www.moe.gov.cn/jyb_xwfb/xw_zt/moe_357/s6211/s6329/s6332/s6336/201511/W020151126579370501699.pdf
- School lunch project Fund Bureau. (n.d.a). ความเป็นมาของกองทุนเพื่อโครงการอาหารกลางวัน. Retrieved from <http://www.obecschoollunch.com/history/>
- School lunch project Fund Bureau. (n.d.b). School lunch project Fund Bureau. Retrieved from <http://www.obecschoollunch.com/>
- School lunch project Fund Bureau. (n.d.c). การดำเนินงานตามนโยบายรัฐบาล หรือนโยบายของกระทรวงต้นสังกัด. Retrieved from <http://www.obecschoollunch.com/nayobuy/>
- Singsatit, W. (2012). *Factors Affecting the implementation of School lunch project :A Case Study of Samutprakan Primary Educational Service Area Office 1*. (M.P.A. (Public Policy)). Srinakharinwirot University, Retrieved from http://thesis.swu.ac.th/swuthesis/Pub_Pol/Wantasiri_S.pdf
- Smith, G. D. (2012). Epigenetics for the masses: more than Audrey Hepburn and yellow mice? *International Journal of Epidemiology*, 41(1), 303-308. doi:<https://doi.org/10.1093/ije/dys030>
- Spoto, D. (2006). *The Life of Audrey Hepburn*: Crown.
- Sripatta, A. (2021). Conditions and problems in school lunch program management. Basic under the Office of Primary Educational Service Area in Phitsanulok province. *Journal of MCU Nakhondhat*, 8(6), 192-207. Retrieved from <https://so03.tci-thaijo.org/index.php/JMND/article/view/252707>
- STUDY, D. H. DUTCH HUNGERWINTER STUDY. Retrieved from <https://www.hongerwinter.nl/?lang=en>
- Takahashi, M. (2017). Rekishi teki hensen kara mita "kyuushoku" no kyouiku teki na yakuwari
- How School Lunches Have Become an Essential Part of Education:Changes over Its 100 Year History. *Hakuoh journal of the faculty of education*, 11(1), 105-132. Retrieved from <http://id.nii.ac.jp/1510/00002107/>
- Tanaka, N. M. M. (2012). School lunch project for health promotion among children in Japan. *Asia Pacific Journal of Clinical Nutrition*, 21(1), 155-158. doi:doi.org/10.6133/APJCN.2012.21.1.22
- The Japanese Association for Human Auxology. (n.d.). Nihon Seichou Gakkai to wa. Retrieved from <https://auxology.jp/overview/seichouwhat>
- The T74 Newsletter. (2020). With Threats Looming to Both Food Stamps and the Healthy Hunger Free Kids Act, Providing Students With Healthy Meals Never More Critical. Retrieved from <https://www.the74million.org/article/with-threats-looming-to-both-food-stamps-and-the-healthy-hunger-free-kids-act-providing-students-with-healthy-meals-never-more-critical/>
- UN. (n.d.a). SUSTAINABLE DEVELOPMENT GOALS. Goal 2: Zero Hunger. Retrieved from <https://www.un.org/sustainabledevelopment/hunger/>

- UN. (n.d.b). UN Population Division Data Portal. Retrieved from <https://population.un.org/dataportal/home>
- UNICEF. (2020). ASIA AND THE PACIFIC REGIONAL OVERVIEW OF FOOD SECURITY AND NUTRITION. Retrieved from <https://www.unicef.org/rosa/media/12181/file/Asia%20and%20the%20Pacific%20Regional%20Overview%20of%20Food%20Security%20and%20Nutrition.pdf>
- WHO. (2016). Double-duty actions for nutrition: policy belief. Retrieved from <http://apps.who.int/iris/bitstream/handle/10665/255414/WHO-NMH-NHD-17.2-eng.pdf>
- Yamamoto, N., Shibata, Katsumi. (2019). Fortified rice. *Konan Women's University studies. II, 13*, 83-91. Retrieved from <http://id.nii.ac.jp/1061/00001711/>
- Yoshiike, N. (2010). 日本総合健診医学会第 38 回大会—教育講演 6—食事バランスガイドと生活習慣病等の予防戦略—
食事バランスガイドと生活習慣病等の予防戦略. *総合健診*, 37(5), 514-516. doi:10.7143/jhep.37.514
- Yoshiike, N. (2011). 栄養問題は国境を超える. *Japan International Child Health Association Journal*, 1(2), 5-6. Retrieved from <http://jicha.jp/jicha/journal/0102.html>
- ชนก แสนดิยศ, พ. ย., สมเกียรติ ตุ่นแก้ว,. (2015). Lunch Project Administration of Basic Education Institutions in Special Area Under Chiang Rai Primary Educational Service Office Area 3. *Graduate School Journal*, 8(18). Retrieved from https://so01.tci-thaijo.org/index.php/crrugds_ejournal/article/view/80628
- 出版ダイジェスト社, 社. 出. (2004). 食育コンクール特集. Retrieved from <https://www.ruralnet.or.jp/syuppan-digest/20040211/index.htm>

- Aoki, K. (2014). Seikatsu shūkan no henka to shippei kouzou, Aoki heihachirou kinen yobou igaku kouhou jigyoudan. Retrieved from https://www.hosp.mie-u.ac.jp/epidemiology/src/1434/AokiVol3_pc.pdf
- Barilla Food Center for Nutrition Foundation. (2017). Japan shows food education works. Retrieved from https://medium.com/@BCFN_Foundation/japan-shows-food-education-works-6b7aa32cb809
- Camponotes.com. (2013). METHODOLOGICAL APPROACHES IN COMPARATIVE EDUCATION. [Web log post]. Retrieved from <http://camponotes.blogspot.com/2013/01/methodological-approaches-in.html>
- Chavasit, V., Kasemsup, V., & Tontisirin, K. (2013). Thailand conquered under-nutrition very successfully but has not slowed obesity. *Obesity Reviews*, *14*, 96-105. doi:10.1111/obr.12091
- Doustmohammadian, A., Omidvar, N., Keshavarz-Mohammadi, N., Abdollahi, M., Amini, M., & Eini-Zinab, H. (2017). Developing and validating a scale to measure Food and Nutrition Literacy (FNLIT) in elementary school children in Iran. *PLOS ONE*, *12*(6), e0179196. doi:10.1371/journal.pone.0179196
- Durkheim, E. (1982). *The Rules of Sociological Method* (S. Lukes Ed.): Red Globe Press London.
- Harlan, C. (2013, 26 January 2013). On Japan's school lunch menu: A healthy meal, made from scratch. *The Washington Post*. Retrieved from https://www.washingtonpost.com/world/on-japans-school-lunch-menu-a-healthy-meal-made-from-scratch/2013/01/26/5f31d208-63a2-11e2-85f5-a8a9228e55e7_story.html
- Hawkes, C., Ruel, M. T., Salm, L., Sinclair, B., & Branca, F. (2020). Double-duty actions: seizing programme and policy opportunities to address malnutrition in all its forms. *The Lancet*, *395*(10218), 142-155. doi:10.1016/s0140-6736(19)32506-1
- Inoue, T. (2011). 「学校給食」とのかかわりから想うこと. *美味技術研究会誌*, *2011*(17), 5-8. doi:10.11274/bimi2002.2011.17_5
- Iwasaki, M. (2009). Memories of "LARA" : Relief and Skimmed Milk Sent to Day-Care Centers After World War II. *Bulletin of Tokyo Kasei University Museum*, *14*, 19-32. Retrieved from <http://id.nii.ac.jp/1653/00010295/>
- Japan, P. M. s. O. o. (2015). *Oranda AIM ni okeru eiyou kaizen no kokusai tenkai ni kansuru chousa houkou (gaiyou)*. Retrieved from https://www.kantei.go.jp/jp/singi/kenkouiryu/kokusaitenkai/eiyo_dai2/bessi02.pdf
- Japan, T. W. A. o. (Producer). (2021, 28 June 2023). Murata bu kai chō kouen “nihon ryouri no kihon”. Retrieved from https://www.youtube.com/watch?v=o7qbNmRQ_E
- Jumpatong, D. (2007). School Lunch Program and Rice Consumption Behavior in Thailand. Retrieved from <http://worldfood.apionet.or.jp/thai.pdf>
- Kondo, J. (2018). Senryō ki doitsu no shokuryō nan. *Bulletin of the Nanzan Center for European Studies*, *24*, 13-49. doi:doi:10.15119/00001820
- Kubota, N. (2012). Changes of School Dietitian Jobs after World War II in Japan. *Hokkai-Gakuen University, the journal of economics*, *60*(3), 99-146. Retrieved from <http://hokuga.hgu.jp/dspace/handle/123456789/2212>

- Lambers, W. (n.d.). We Could Take Humanitarian Lessons from Herbert Hoover. Retrieved from <https://historynewsnetwork.org/article/46560>
- Leite, S. (2014). Comparative Education as a tool for improvement. Retrieved from <https://educatinginternationally.wordpress.com/2014/04/22/comparative-education-as-a-tool-for-improvement/>
- Loysongkroa., W. K. J., Chotivichien., S., Viriyautsahakul., N., & Saiwongse., N. (2014). Public Policy for Quality School Lunch Development in Thailand. *World Academy of Science, Engineering and Technology*, 8(9). Retrieved from <https://publications.waset.org/9999240/pdf>
- Lumey, L. H., & Stein, A. D. (1997). In utero exposure to famine and subsequent fertility: The Dutch Famine Birth Cohort Study. *American Journal of Public Health*, 87(12), 1962-1966. doi:10.2105/ajph.87.12.1962
- MAFF. (2012). *A Guide to Shokuiku*. Retrieved from https://www.maff.go.jp/j/syokuiku/guide/pdf/00_en_guide.pdf
- MAFF. (2020). *01 Shouwa kara reiwa made, nendai betsu ni miru gakkou kyuushoku no hensen*. Retrieved from <https://www.maff.go.jp/j/pr/aff/2006/food01.html>
- MAFF. (2022). *Reiwa 3 nendo Shokuiku hakusho*. Retrieved from https://www.maff.go.jp/j/syokuiku/wpaper/attach/pdf/r3_wpaper-23.pdf
- MEXT. (2008). *6 Kyougaku seishi to bunkyou seisaku no henka*. Retrieved from https://www.mext.go.jp/b_menu/hakusho/html/others/detail/1317585.htm
- MEXT. (2017). *Explanation about course of study (Special activity)*. Retrieved from https://www.mext.go.jp/content/20221213-mxt_kyoiku02-100002607_014.pdf
- Murai, G. (1913). *Kuidōraku aki no maki*. Tokyo, Japan: Hōchisha.
- Nakamura, T. (2022). History of Nutritional Improvement in Japan. In (pp. 29-60): Springer Singapore.
- NIER. (2013). *School Lunch Program in Japan*. Retrieved from <https://www.nier.go.jp/English/educationjapan/pdf/201303SLP.pdf>
- Nomura, M., Yamaguchi, M., & Nishi, N. (2022). Global Trends in Double-Duty Actions for Nutrition as an Intervention for the Double Burden of Malnutrition. *The Japanese Journal of Nutrition and Dietetics*, 80(1), 60-68. doi:10.5264/eiyogakuzashi.80.60
- OBEC. (2022). แผนพัฒนากองทุน. Retrieved from <http://www.obecschoollunch.com/wp-content/uploads/2022/05/1.-%E0%B9%81%E0%B8%9C%E0%B8%99%E0%B8%9E%E0%B8%B1%E0%B8%92%E0%B8%99%E0%B8%B2-1.pdf>
- OBEC. (n.d.a). Education Management Information System : EMIS. Retrieved from https://data.bopp-obec.info/emis/school.php?Area_CODE=6501
- OBEC. (n.d.b). Education Management Information System : EMIS. Retrieved from https://data.bopp-obec.info/emis/school.php?Area_CODE=6502
- OBEC. (n.d.c). Education Management Information System : EMIS. Retrieved from https://data.bopp-obec.info/emis/school.php?Area_CODE=6503
- Petchoo, J., Kaewchutima, N., & Tangsuphoom, N. (2022). Nutritional quality of lunch meals and plate waste in school lunch programme in Southern Thailand. *Journal of Nutritional Science*, 11, e35. doi:10.1017/jns.2022.31
- Phitsanulok Primary Educational Service Area Office 1 (2018, 21 June 2018). Retrieved from <https://www.facebook.com/educationplk1/posts/1983894858347410/>

- Popkin, B. M. (2006). Global nutrition dynamics: the world is shifting rapidly toward a diet linked with noncommunicable diseases. *The American Journal of Clinical Nutrition*, 84(2), 289-298. doi:<https://doi.org/10.1093/ajcn/84.2.289>
- Rogers, P. (2017, 5 June 2017). Feeding Young Minds: The Importance of School Lunches. Retrieved from *The New York Times*. Retrieved from <https://www.nytimes.com/2017/06/05/well/feeding-young-minds-the-importance-of-school-lunches.html>
- Sasaki, H. E., Kunihiro. (2018). 医療・福祉の根本思想としての第 25 条成立の過程及びサムス PHW 局長による戦後の公衆衛生及び地域福祉改革に関する歴史検証. *Integrated studies in nursing science*, 1, 1-24. Retrieved from <http://id.nii.ac.jp/1827/00004675/>
- Sato, K. (2015). "nihon ni okeru gakkou kyuushoku" - shakai hendou to kyouiku teki kadai no shiten kara. Retrieved from http://www.moe.gov.cn/jyb_xwfb/xw_zt/moe_357/s6211/s6329/s6332/s6336/201511/W020151126579370501699.pdf
- School lunch project Fund Bureau. (n.d.a). ความเป็นมาของกองทุนเพื่อโครงการอาหารกลางวัน. Retrieved from <http://www.obecschoollunch.com/history/>
- School lunch project Fund Bureau. (n.d.b). School lunch project Fund Bureau. Retrieved from <http://www.obecschoollunch.com/>
- School lunch project Fund Bureau. (n.d.c). การดำเนินงานตามนโยบายรัฐบาล หรือนโยบายของกระทรวงต้นสังกัด. Retrieved from <http://www.obecschoollunch.com/nayobuy/>
- Singsatit, W. (2012). *Factors Affecting the implementation of School lunch project :A Case Study of Samutprakan Primary Educational Service Area Office 1*. (M.P.A. (Public Policy)). Srinakharinwirot University, Retrieved from http://thesis.swu.ac.th/swuthesis/Pub_Pol/Wantasiri_S.pdf
- Siong., T. E., Florentino., R. F., Hardinsyah., Hlaing., I. M. N. L. M., Chotvichien., S., & Hop., L. T. (2020). A review of national plans of action for nutrition in Southeast Asian countries. *Malaysian Journal of Nutrition*, 26(3), 501-524. doi:10.31246/mjn-review-26-3
- Smith, G. D. (2012). Epigenetics for the masses: more than Audrey Hepburn and yellow mice? *International Journal of Epidemiology*, 41(1), 303-308. doi:<https://doi.org/10.1093/ije/dys030>
- Spoto, D. (2006). *The Life of Audrey Hepburn*: Crown.
- Sripatta, A. (2021). Conditions and problems in school lunch program management. Basic under the Office of Primary Educational Service Area in Phitsanulok province. *Journal of MCU Nakhondhat*, 8(6), 192-207. Retrieved from <https://so03.tci-thaijo.org/index.php/JMND/article/view/252707>
- STUDY, D. H. DUTCH HUNGERWINTER STUDY. Retrieved from <https://www.hongerwinter.nl/?lang=en>
- Takahashi, M. (2017). Rekishi teki henshen kara mita "kyuushoku" no kyouiku teki na yakuwari

- How School Lunches Have Become an Essential Part of Education: Changes over Its 100 Year History. *Hakuoh journal of the faculty of education*, 11(1), 105-132. Retrieved from <http://id.nii.ac.jp/1510/00002107/>
- Tanaka, N. M. M. (2012). School lunch project for health promotion among children in Japan. *Asia Pacific Journal of Clinical Nutrition*, 21(1), 155-158. doi:doi.org/10.6133/APJCN.2012.21.1.22
- The Japanese Association for Human Auxology. (n.d.). Nihon Seichou Gakkai to wa. Retrieved from <https://auxology.jp/overview/seichouwhat>
- The T74 Newsletter. (2020). With Threats Looming to Both Food Stamps and the Healthy Hunger Free Kids Act, Providing Students With Healthy Meals Never More Critical. Retrieved from <https://www.the74million.org/article/with-threats-looming-to-both-food-stamps-and-the-healthy-hunger-free-kids-act-providing-students-with-healthy-meals-never-more-critical/>
- UN. (n.d.a). SUSTAINABLE DEVELOPMENT GOALS. Goal 2: Zero Hunger. Retrieved from <https://www.un.org/sustainabledevelopment/hunger/>
- UN. (n.d.b). UN Population Division Data Portal. Retrieved from <https://population.un.org/dataportal/home>
- UNICEF. (2020). ASIA AND THE PACIFIC REGIONAL OVERVIEW OF FOOD SECURITY AND NUTRITION. Retrieved from <https://www.unicef.org/rosa/media/12181/file/Asia%20and%20the%20Pacific%20Regional%20Overview%20of%20Food%20Security%20and%20Nutrition.pdf>
- WHO. (2016). Double-duty actions for nutrition: policy belief. Retrieved from <http://apps.who.int/iris/bitstream/handle/10665/255414/WHO-NMH-NHD-17.2-eng.pdf>
- Yamamoto, N., Shibata, Katsumi. (2019). Fortified rice. *Konan Women's University studies. II*, 13, 83-91. Retrieved from <http://id.nii.ac.jp/1061/00001711/>
- Yoshiike, N. (2010). 日本総合健診医学会第 38 回大会—教育講演 6—食事バランスガイドと生活習慣病等の予防戦略—
食事バランスガイドと生活習慣病等の予防戦略. *総合健診*, 37(5), 514-516. doi:10.7143/jhep.37.514
- Yoshiike, N. (2011). 栄養問題は国境を超える. *Japan International Child Health Association Journal*, 1(2), 5-6. Retrieved from <http://jicha.jp/jicha/journal/0102.html>
- ชนก แสนดิยศ, พ. ย., สมเกียรติ ตุ่นแก้ว,. (2015). Lunch Project Administration of Basic Education Institutions in Special Area Under Chiang Rai Primary Educational Service Office Area 3. *Graduate School Journal*, 8(18). Retrieved from https://so01.tci-thaijo.org/index.php/crrugds_ejournal/article/view/80628
- 出版ダイジェスト社, 社. 出. (2004). 食育コンクール特集. Retrieved from <https://www.ruralnet.or.jp/syuppan-digest/20040211/index.htm>