Chapter 4

Results

4.1 Introduction

This chapter contains quantitative and qualitative results. The quantitative data were obtained from the assessment of a healthy eating policy and preschool children's dietary intake in public schools in Muang district, Phrae province, Thailand. It includes effects of developed healthy eating policy on preschool children's dietary intake and school policies. A detailed description of the characteristics of children attending schools adopting healthy eating policy and those attending schools not adopting the policy are also described. The qualitative data were obtained from each step of development of the healthy eating policy; policy selection, policy advocacy, policy adoption and policy implementation. It describes a qualitative study based on in-depth interviews conducted with headmaster, teachers from the intervention schools, Delphi technique conducted with educational experts and focus group discussion conducted with preschool parents, teachers, health officers and school board members from the intervention schools. Lastly a model to implement a healthy eating policy in school which was developed from all observation is proposed.

4.2 The assessment of the existing healthy eating policy for preschool children in public schools in Phrae province, Thailand

The assessment of healthy eating policy was based on the assessment of food policy in schools in Muang, Phrae province described in Chapter 3. Table 1 shows the existing healthy eating policies implemented by the schools. The existing policies were grouped as: (1) “fully in place”, (2) “partially in place”, (3) “currently under development” and (4) “not in place”. Of the total of 47 schools, 27 (57.4%) were in the “fully in place” category. They had written school health policies which provided a comprehensive programme of health education designed to promote healthy eating, made food without added sugar, available wherever food was served inside and outside the canteen, and established collaborations among parents, teachers and school board members.

Concerning the environment, existing implemented healthy eating policies which 100% of schools in the “fully in place” category had implemented were: a policy to offer sugarless milk for preschool children; a policy to allow all students to have enough time to eat lunch in a clean, safe and pleasant environment; a policy to have all teachers schedule time for students to wash their hands before meals and snacks; and a policy to establish links with professionals who can provide counselling on nutritional problems. Furthermore, most schools (85.1%) offered healthy drinks and discouraged the availability of carbonated drinks. They also offered healthy snacks and discouraged snacks with added sugar for school meals or break meals (83.0%). 89.4% of those schools had partial strategies for healthy eating outside school and

63.8% of schools had fully established a plan of health promotion activities for students and staff. However, 17.0% of schools had guidelines for healthy eating. Only 6.4% of the schools stated that the school cooks had guidelines for healthy eating. Additionally, the communication regarding healthy eating policies to all stakeholders was under development in 51.1% of schools.

Curriculum and instruction regarding nutrition and food for preschool children

All 100% of schools helped students learn specific nutrition-related skills, such as how to recognise healthy meals (Table 2). Moreover, 66.0% of schools provided a nutrition education activity that was fun, participatory, developmentally appropriate and culturally relevant. Only 44.7% of schools emphasised the positive aspects of healthy eating and the harmful effects of unhealthy eating.

Staff, family and community involvement, programme coordination, and evaluation

All schools (100%) encouraged and involved family members and the community in supporting and reinforcing a healthy eating policy. Additionally, all of them regularly evaluated the effectiveness of their programme and curricula aimed at promoting healthy eating and made changes as appropriate (Table 3). Less than 60% of schools involved family members or the community in supporting and reinforcing nutrition education (55.3% and 51.1% respectively). More than 80% of schools had collaboration between food service staff and teachers (85.1%), and coordinated food service with nutrition education and other components of school health programme (83.0%). Approximately 50% of schools did not provide staff involved in nutrition

with adequate and ongoing in service training that focused on teaching strategies for promoting healthy eating behaviour.

As described in research design, the 16 schools in the fair group were involved in the study. The 16 schools were divided into two groups by enrollment; 8 intervention schools and 8 control schools.

4.3 Healthy Eating Policy Development

The main points relevant to development of healthy eating policy for preschool children are presented in this section. The results were based on all intervention schools – not focused on only one school. Quotes are referenced as (Interview). Results are presented generally as the consensus view - opposing opinions are inserted where relevant. However, there was minimal disagreement among participants around the major themes discussed, which could be attributed to several factors identified by observation during the study**.**

Eight intervention schools were involved in developing healthy eating policy for preschool children. The steps of policy development started with policy selection and then policy advocacy, policy implementation, and policy evaluation. The key persons of this study were preschool parents, school staff, school board members and educational supervisors. The key stakeholders and perhaps most crucial value stakeholders were parents and school staff such as headmasters and preschool teachers.

4.3.1 Healthy eating policy selection

The results of healthy eating policy selection were divided into 2 sections. First section was representative parents' views from the focus group discussions. The second section was the views of educational experts using the Delphi process.

4.3.1.1 Healthy eating policy selection from parents

In order to enhance collaboration and networking among key stakeholders, this study started by inviting representative parents of eight intervention schools to participate in the focus group discussion regarding the situation of healthy eating policy in their children's schools. The aim of this step was to assess concept of healthy eating policy among representatives of parents of preschool children and how they thought about developing healthy eating policy for their children. The work from the parents was more important than from teachers or schools. The results from this step are shown below. The discussion started by asking the opinions on a healthy school and then what the situation was of healthy eating policy in their children's school. After the discussion, the researcher gained a consensus regarding how to improve eating behaviour of their children.

Nine parents (1 grandmother, 1 grandfather, 3 fathers, 4 mothers) from 7 intervention schools participated in this focus group discussion. One representative parent could not join the discussion because he was busy on that day.

Themes

Opinions on a healthy school

A healthy school in parents' views should providing clean water, healthy food, snacks and beverages for students. Moreover, students should also live and learn in a safe, and clean environments.

Opinions of parents on healthy eating in school

When asked what healthy eating in school meant, the representative of parents said a healthy eating in school mean:

a) Children eat a daily nutritious food based on a five food group.

b) Children eat a well balanced foods and snacks.

c) Children have meal at the meal time.

Opinions on existing situation of healthy eating policy

When asked about the situation of healthy eating policy in the school, most parents said that schools shops sold unhealthy food or snacks for children such as crispy snack, gum with sugar and soft drink. Therefore, parents suggested that school shops should sell only healthy food and snacks, such as fresh fruit. A healthy food and snacks should be available wherever and whenever they are sold or otherwise offered at school. Moreover, children should have many healthy snack choices at snack time.

The other situation was children did not eat all kinds of foods at mealtimes. Parents believed that if teacher forced students to finish all of the food at meal time, the

children would obey them "*I would like the teacher to provide nutritious meal for my daughter and force her to eat them all*" (Mother 1). However, some parents suggested that parents should cooperate with schools to help children establishing a healthy eating behaviour "*All parents should tell schools about what they should provide for our children, a voice from only one parent could not do*" (Father 1).

After this discussion, some parents suggested that all of the intervention schools should improve children' eating behaviour by using some strategies but they could not make a decision what they should do. Moreover, they wanted to know what the consensus among all parents in each school regarding the opinions about children's beahviour and the strategies. Therefore, they asked the researcher team for organising the focus group discussion with other parents in all intervention schools and gain the consensus after the discussion.

4.3.1.2 Healthy eating policy selection from educational staff

After the policy selection process by the representative parents, Delphi technique was used to assess the concept of healthy eating policy among educational experts, and how they thought about developing healthy eating policy for preschool children. The objectives of this process were the same as used earlier among the representative of parents. This step would not happen if the representative of parents did not want to develop the policy.

There were 10 panelists: 5 educational supervisors who were responsible for school meal projects or preschool level, and 5 headmasters. This Delphi process consisted of three rounds as described in Chapter 3. Then panelist's views were organised into four themes that emerged from the data:

(a) The importance of healthy eating policy for preschool children

(b) The reason of changing existing healthy eating policy and how to develop the healthy eating policy

(c) The issues that should be addressed in the healthy eating policy

(d) Multi-stakeholder collaboration

The importance of healthy eating policy for preschool children.

The panelists believed that a healthy eating policy for preschool children is important because:

1. Healthy young children will grow up to be a healthy adult.
2. The policy will support the growth, health and well-being of the preschool children.
3. Adequate nutrition during childhood is necessary to maintain overall health and for growth.

The reasons for changing existing healthy eating policy and how to develop the healthy eating policy

Panelists were asked about their opinions that schools should change the existing healthy eating policy for preschool or not, and why they thought that. The panelists had a consensus that some schools provided an inappropriate school meal and snacks for this age. Therefore, the schools should revise the existing healthy eating policy. The important thing that should be of concern when developing the healthy eating policy was having rules by gaining the collaboration between all stakeholders; school staff, community, parents and health officers. The policy should be clear, practical and consistent with community culture. In addition, continuous improvement and effectiveness monitoring of the policy should be implemented to ensure the implementation consistent with current situation. Moreover, school and communities should be good model for children, for example providing only healthy food and snacks in village shops and school shops, and older people should provide healthy food for their own family in order to encourage the positive attitude for younger children.

Issues that should be addressed in the healthy eating policy

When asked about the issues which should be addressed in the written healthy eating policy, many issues were proposed by the panelists. Firstly, healthy children policy by gaining the multi-collaboration is a useful mean. For example, the government provided a budget, and the community or parents support school activities. Secondly, the policy should encourage everybody to be supporter and coordinator. Thirdly, children should have nutritious and clean meal, and every child should have free meal

for lunch. Fourth, school shop and village shop should be monitored to ensure that the healthy snacks food and beverages are provided. Fifth, continuous monitoring system for assessing the implemented healthy eating policy should be written. Finally, the role in implementing the policy of each stakeholder group should be in place, to ensure what they should do.

Multi-stakeholder collaboration

The panelists believed that school healthy eating policy should be developed in collaboration with all stakeholders. Those who develop and implement the policy must involve stakeholder at an earlier stage and throughout the process of policy development. Regarding developing healthy eating policy for preschool children, the government should have a national policy while the local policy should be gain from multi-collaboration, to ensure that the policy is real suitable for the people.

The role of each stakeholder in implementing healthy eating policy is important. Every agency (eg. community, parent and school staff) should propose their responsibilities. Local authorities, parents and school board members can be supporters in providing the budget, involved in certain activities and gave recommendations or valuable opinions. Preschool teacher must be a key actor of the implementation of healthy eating policy and the headmaster must responsible and play the active role as an effectiveness monitor. For higher levels, Provincial authority such as an educational supervisor should be a supporter in the implementation. In addition, the government should support a local policy such as supporting the budget for implementation.

4.3.2 Healthy eating policy advocacy

In this step, many strategies were used to advocate the stakeholders. First, the parents, school board members and school staff were involved in a second focus group discussion. The main objective of the second discussion was to advocate the participants about what healthy eating is and how to improve eating behaviour of preschool children. Second, the results from the first and second discussion, and by using Delphi process were disseminated to parents, school board members and teachers by using a newsletter in order to announce the community what the schools were doing. One part of this newsletter was left as free space for comment. The theme arising from the focus group discussion and a conclusion from those comments were described below.

4.3.2.1 Themes arising from the focus group discussions

The second focus group discussion was used to elicit the opinions of parents of preschool children, school board members and teachers regarding healthy eating, and to test stakeholder's reaction about developing healthy eating policy for preschool children in this area.

There were 14 focus group discussions. Each focus group was composed of parents, school staff and school board members. The parents attending the groups were mainly women (78.1%). Approximately sixty one per cent (N=95, 61.3%) of the

participants were labourers and 19.4% (N=30) were farmers. Their ages ranged from 22 to 72 years. About Fifty three per cent (53.5%) of the participants had completed only primary school and 31% had completed secondary school. Parents, guardians and school board members who could not participate in these focus group discussions were those who worked outside the village or whose work or other duties precluded them from attending the focus group discussions. One hundred and twenty three parents or guardians, 11 school board members and 21 teachers took part in focus group discussions**.**

Many themes emerged from the second focus group discussion: Opinion on healthy eating in school, Opinion of parents on healthy eating at home, Opinions on parents, teachers and school board members' attitudes and practices regarding children's eating behaviours, Children's eating behaviours in schools, Factors influencing children's food choices. After the second focus group discussion, parents, teachers and school board members had a consensus about developing the healthy eating policy for preschool children as described below.

Themes

Opinion on healthy eating in school

When asked what healthy eating in school meant, the parents, teachers and school board members said it meant eating nutritious snacks, food and beverages based on the five food groups. In addition, they thought that healthy eating was about eating well-balanced foods and snacks every day and also having meals at appropriate times. Examples of responses were: "*Eat safe meals based on the five food groups and*

ensure that vegetables and fruits constitute more than fifty per cent of the meal" (Senior school board member 1). "*Eat nutritious food, especially vegetables and meat*" (Teacher 1). "*Have meals based on the five food groups and a well-balanced diet every day*" (Grandmother 1). "*Eat various foods and don't eat snacks between meals because children would take smaller meals*" (School board member 1). "*Eat various foods, meat, fish, egg and fruits*" (Mother 2). Regarding healthy eating in school, teachers, parents and school board members were concerned only about the components of foods and drinks such as what foods the school provided for their children, e.g., fried rice with pork, vegetable soup, or milk. They were not concerned about the environmental, educational and social factors that had an influence on healthy eating.

Opinion of parents on healthy eating at home

At home, most parents did not cook food based on the five food groups even though they knew that it was very important to do so. Food was provided to their young children based on the children's preferences and the economic status of the family. A diet that is rich in protein such as fried chicken, fried fish, and omelet is the favorite menu for young children while foods compose of vegetables are the favorite menu for most parents. "*My child likes fried chicken very much"* (Father 1). "*My son prefers meat to vegetable while parents prefer vegetable"* (Mother 3). "*My daughter's favorite vegetable is white popinac (local plant)"* (Mother 1). "*My granddaughter eats some vegetables which are good smell* (Grandfather 1). *"I cook what my son likes because he will eat a lot and cut down on left over food*" (Mother 4). "*I cook whatever granddaughter likes"* (Grandmother 2).

Regarding snack intakes at home, some parents provide fruits, Thai desserts or bread while most of parents let children select snack by themselves. *"I always buy fruits for kids"* (Mother 5). *"My daughter and her dad usually buy Kanomshan*" (Grandmother 3). "*We (Dad and child) like bread with cooked pork inside*" (Father 2). *"I let him buy whatever he wants at village shop"* (Mother 3). *"Give her money and she selects (snack) by herself"* (Father 3).

Opinions on parents, teachers and school board members' attitudes and practices regarding children's eating behaviours

The researcher asked all participants what their children purchased when they went to the village shop together and if they had encouraged their children to buy any nutritious snacks. The results were most parents thought young children were not totally capable of planning a well-balanced diet. "*If he has money, he will buy the snacks he likes*" (Mother 3). However, parents did not encourage their children to purchase nutritious snacks because they did not want to make them feel bad and they thought that the teachers had more potential power in influencing their children's diet than they had themselves. Therefore, some teachers suggested a technique for parents to support and reinforce children's eating behaviours by providing healthy snacks, foods and beverages for young children at home. Older people should emphasise the positive and highlight the appealing aspects of foods and beverages. "*Parents should advise their children what to buy and sometimes you need some tricks to motivate them*" (Teacher 2). In addition, senior school board members added their opinions about how to raise young children with healthy eating behaviours; "*You shouldn't let*

your child buy snacks or beverages by himself. He is too young." (Senior school board member 2). "*You should advise what she should buy*" (School board member 3).

Children's eating behaviours in schools

When asked the participants how the meal was provided for children at school, the results was every school provided lunch for the children. Each school tried to provide a variety of foods. However, the menus depended on each school's economic status. When the researchers asked the school staffs what foods young children liked and disliked, they reported that most children ate everything provided in school. Preschool children's eating behaviours at school were different from those at home. They might eat some foods at school but never at home. "*At home my daughter didn't eat vegetables or fruits, she ate only fried chicken, crispy snacks and coca-cola but when she had meals at school the teacher reported that she ate everything*" (Mother 6).

Every school provided sugarless milk at break time to comply with a national policy to provide sugarless milk for Thai school children. The sugarless milk is the only one snack provided by the government to all Thai children from preschool to Grade 4. Therefore, all intervention schools permit the children brings the snacks with them from home. However, children could buy the snacks from school shop during snack time in some schools.

At school, most young children brought crispy snacks rather than fruits or Thai dessert to school. Most parents allowed their children to buy snacks on the way to

school. "*She buys snacks at a village shop every morning and chooses it by herself. She knew it from television advertising programmes, every weekend*" (Father 4).

Factors influencing children's food choices

When asked which factor influence children to buy their favorite snacks, many significant factors influenced food choices of preschool children. Firstly, their peer group influenced young children. For example, when their friends brought a new snack to school they asked their parents to buy the same items. Secondly, young children were likely to be influenced by television advertising of food products, especially during cartoon programmes. Thirdly, most children were more likely to buy high-fat or sweetened snacks or sweetened beverages because of their colourful packaging, and their convenience. In addition, young children preferred the taste of those snacks and beverages to fresh fruit. Finally, the premiums insides the snack packages were attractive. They included rings, plastic robots, or stickers. "*When he (his son) bought a crispy snack, he didn't eat it. He wanted only the plastic robot*" (Mother 7).

A need to develop a healthy eating policy for preschool children

After the focus group discussion on healthy eating concepts, all parents, teachers and school board members admitted that they wanted to improve their children's diet both at home and at school. All of them agreed that there was a need to develop a healthy eating policy in school, especially regarding food and snacks for their children. "*School should not provide candies for a young child*" (Grandmother 4). "*At school, he is not allowed to eat snacks during school time*" (Mother 8). "*We should not*

provide candies, snacks and sweetened drinks in school, and not permit non-nutritious snacks or beverages to be sold in our school" (Headmaster 1). "*School will provide only nutritious food such as fruits, bread and sugarless milk*" (Headmaster 2).

The focus groups reiterated that establishing a school policy on snacks would be a good strategy to encourage children to take nutritious foods and snacks. In addition, establishing such a policy would be a new method they had never considered before. Furthermore, they wanted to do something beneficial for their beloved children. However, the focus groups did not want to develop rules at home within each family because they thought that the involvement of school staff, families and community was more powerful. "*We agree in developing rules. This is for our children*" (mother 7). "*It is difficult to do at home, I think at school is better*" (Mother 8). "*If we and the teachers could coordinate, it would be better to encourage children both at home and at school too*" (Mother 9).

After these discussions, each school selected the representative of parents and school board members to be a working group. The headmaster and all preschool teachers were being the members of working group as part of job. The working group were assigned to draw the healthy eating policy and then disseminated to others. The next meetings of each working group were appointed during this session.

4.3.2.2 Summary of findings of parent's comment from the school newsletter

According to the first discussion among the representative parents, the second discussion among all stakeholder, and Delphi process by educational experts, the main result of those processes was all participants had a consensus to develop a healthy eating policy for preschool children in all intervention schools. The first newsletter was used to disseminate the results to all stakeholders and to test stakeholder's reaction about developing healthy eating policy for preschool children. One part of this newsletter was left as free space for comment according to two questions; what benefits of developing healthy eating policy for preschool children are, in their opinions, and what they will do for children in order to have nutritious diets. All stakeholders can put any opinion about what they think without forcing from others.

The school newsletters were sent to preschool parents (N=373), school staffs and school board members (N=200), and educational supervisors (N=20), respectively. There was 39.9% (149/373) of parent's response rate. No response from school staffs, school board members, and the educational supervisors.

The results from the school newsletter: Benefits of developing healthy eating policy for preschool children

The main benefits of developing healthy eating policy were viewed as improving children's behaviour and health, changing adult's behaviour regarding child care; strength coordination among stakeholder, and reducing family expense.

Improving children's behaviour regarding eating

The parents believed that if schools have healthy eating policy the children will improve their behaviours as followed:

1. Children who less exposed to crispy snack, sweets and drink with sugar would eat such snacks less.
2. Children would eat more fruit and vegetable.
3. Children would be able to select proper food for themselves.
4. Children would be able to apply nutrition information into practice.

Children's health

Regarding children's health, most parents realised that adequate nutrition during childhood is necessary to maintain overall health and for growth and development. Therefore, the children in schools with the healthy eating policy would be provided adequate, safety, and proper nutrition during school session. In addition, the children who have proper nutritious food would be healthy, had good development, and were smart and cheerful. The good development was defined as having a proper growth and development of brain, body, mind, and body function according to their ages. One parent pointed out that proper food and physical activities would make children healthier.

Concerning a specific part of the body such as oral health, parents believed that children would have healthy teeth and gum if they had a healthy eating policy in school.

Parent's behaviour regarding child care

Regarding child care, parents believed that developing the healthy eating policy would encourage parents and school staff to have more concern about children eating's behaviour. As a consequence of developing the policy, the parents would help regulate the food consumption behaviour of preschool children. Moreover, the parents would reinforce desirable eating behaviour for their children by recognising and acknowledging good behaviour. For example, parents and school provide menus and food selections that based on five food groups.

Most parents believed that training the child to be a healthy eating conscious person at an early stage was a good first step to start a good eating habit.

Coordination between all stakeholders

The parents believed that the coordination between parents, school staff, and the local government in all activities that conform to the policy would promote children to have a good practice on eating a healthy food or snack. The coordination between all sectors would contribute to regulating eating habits by managing the good eating environment. For example, only healthy food, snacks and beverages are provided in school and community and the adults would be a good role model for children regard to healthy eating behaviour.

Reducing family expense

Some parents believed that developing a healthy eating policy can decrease unhealthy snack intake by children and reduce the money that family spend on such snack.

The results from the school newsletter: The role of each sector in reinforcing healthy eating of children

Parents' role

Most parents emphasised that parents play a major role in promoting healthy eating behaviour of young children at home. They can provide nutritious menus for children. If parents have the knowledge of healthy food and snack, then children will be more likely to follow a good dietary practice. Parents should take care of what children eat at home and complement what children have to eat in school to ensure that children have sufficient nutrients. Good role modelling and providing local healthy food selection can send children positive messages about good nutrition.

School staff role

Some parents proposed that teachers and school cooks should provide food and select menus based on five food groups and taking into consideration the number of meals and snacks each child should consume during the school session. In addition, teachers should promote and provide nutrition education not only for children but to the parents and school staffs. Additionally, it was important that school staffs should establish a good communication with parents about nutrition issues. When planning meals or snacks, the children's opinion should be involved because they would eat the

food they like more than they do not like. However, all schools menus must base on a five food group to ensure the proper and adequate nutrition of each meal not only based on children's preference. Children should have the opportunity to learn about food, nutrition and food preparation and how they are linked to health, while in school. The encouraging of good child peer model is very important for school staff to concern because friend is the one of influencing factor for food selection.

The role of a local community on promoting healthy eating for preschool children

Some parents believed that community could support to promote the healthy eating behaviour among young children. For example, the local authorities should support the school with sufficient budget to provide nutritious school meal and establish the local nutritional center in order to promote healthy eating. In addition, they should monitor the village shop to provide only healthy food or snack.

The local health officer's role

Some parents suggested about the health officer's role such as local health officer or nutritionist should provide nutrition education for school staff, parents and community at least 2 times a year. The nutritional guideline for school children is also needed for parents. The local health officer should responsible for monitoring food safety in village shop and school.

The government role

Regarding the government role, some parents suggested that the government should provide adequate budget to support a healthy school meal. Because of high cost for

healthy food, if school get this support from the government, the school can provide a nutritious food, snack and beverage for young children. Strictly regulating television advertisements, especially snack advertising, should be the responsible of the government. If the government could monitor the snack advertising more strictly, children would be able to expose to a better environment leading to have only a healthy snack.

4.3.3 Healthy eating policy adoption

In this step, the focus group discussion was used again. The objective of this focus group was to evaluate feedback from parents, school staffs, school board members, and local health officers regarding the healthy eating policy for preschool children. Before beginning the third focus group discussion, the researcher reported the conclusion of parents' comments from the newsletter regarding how the developing healthy eating policy for preschool children is important, and the role of adults on promoting healthy eating for preschool children. There were 8 focus group discussions for 8 intervention schools in this step. Each group was composed of parents, school staff, school board members and local health officers. They were representative of stakeholder and being a working group for developing healthy eating policy for preschool children. Sixty eight representative parents and school board members, 22 teachers, and 5 local health officers from 8 intervention schools took part in focus group discussion as described in Table 4.

The participants started by discussing the existing healthy eating behaviour of preschool children and then they proposed the details of written healthy eating policy. When asked the existing eating behaviour of children, most parents reported that their kids did not bring crispy snacks to schools and ate Thai dessert instead. "*I did not take him (son) to village shop in the morning*" (Mother 10). "*I bought Thai desserts for my daughter although they added sugar but it is more nutritious than crispy snacks. Anyway, she did not complain why she could not buy crispy snack*" (Mother 11).

Some parents said they would prepare fruit for children to bring to school in order to be snack at break time. "*I will prepare fruit for my daughter*" (Mother 11). While most schools provided bread or non-sugar milk at school shop. Many teachers said that fruit was expensive. It was so difficult to provide fruit at lunch time or even selling at a school shop. "*Fruit is very expensive for example guava is almost 20 baht/kg, we can't buy it*" (Teacher 3).

Although most parents, teachers concerned about healthy food and snacks for children, some parents still bought crispy snacks for their kids. Moreover, many children brought crispy snacks to school. This situation affected other children. "*When children saw their friends had crispy snacks, they would ask to share those snacks. Then the day after, they would have the same snack*" (Teacher 4).

Because of the inconsistency practice in school, parents, school staff and school board members needed to establish the rule for their children. Before drafting the policy,

the working groups agreed that the first topic which they needed to concern was high intake of crispy snack among preschool children. Therefore, the schools' objectives were mainly to reduce crispy snacks intake among preschool children. Some parents suggested that if this method was successful, they would move to other aspects such as increasing fruit and vegetable intake.

A defined healthy eating policy in each school

Before beginning of a writing policy process, all of schools elected the leader of the group by voting. Seven of eight heads of the working group to implement the policy were a mother because they believed that a mother would be a better person for taking care of children in meal or snack than a father. One group leader was a father because he was a village head. There was no school staff be voted as a leader because most participants thought that the healthy eating policy for preschool children should be mainly parents' duty, although it would be implemented at school. In addition, school staff should be a supporter.

During the drafting of the policy process, the working group discussed each topic about how to implement it and whether it would be easy to implement or not. If any topics seemed to be difficult to implement, those topic would be discarded. For example, the topic "Do not give money to children" or "Teacher should keep crispy snack and will not give it back after school" Most participants thought the teacher did not have a right to keep such snack from the children or prohibit someone to take money to school. Moreover, the extreme strict rules was not necessary for the earlier part of developing the policy because the implementation process need the

coordination from all stakeholders. Detail of the policy based on the circumstances of each school.

The schools healthy eating policies for preschool children in each intervention school are described below.

School 1(Baan-Rong-Fong)

1. School will not provide crispy snack and soft drink at school shop.
2. We encourage children and parents not to bring snacks from home.
3. Teacher and parents coordinate in promoting children to eat more vegetable and fruit.

School 2 (Baan-Pun-chueng)

1. Do not bring sweets, gum, chocolate and instant noodle to school. Children who bring such snack will be instructed to take this snack home and to eat it after school.
2. All meals and snacks provided are nutritious.
3. Parents must encourage children eat vegetable and fruit.
4. Children must brush their teeth after meal.

School 3 (Baan-Nam-Cham)

1. We encourage children and parents not to bring crispy snack in during the session. If children eat such snacks at home, parents will report teacher.

2. Menus are reported to parents after school to ensure what children intake during school and what parent should cook to children to meet five food groups.
3. Children are not permitted to drink soft drink in both school and home.

School 4 (Baan-Nai-Wiang)

1. Parents are asked to buy only healthy snacks for children.
2. Teacher will keep unhealthy snacks (eg. crispy snacks, sweets) and return it to parents after school.
3. Teachers and parents support students to eat vegetable and fruit.

School 5 (Baan-Supan)

1. All school meals are nutritious.
2. Children who bring crispy snack will be instructed to take this snack home and parents are asked to keep such snack for after school.
3. School and parents encourage children to eat vegetable, fruit and Thai desserts. As part of healthy eating school initiative, curriculum strategies are supportive of healthy eating behaviour. While vegetable, fruit and Thai dessert are provided at home.
4. Teachers are asked to instruct what snack children should buy during school session.

School 6 (Baan-Maelai)

1. Fruit and Thai desserts only snack breaks for preschool children.

2. Parents are asked not to bring crispy snack in for children. Children who bring such snacks will be instructed to take this snack home and to eat it after school.
3. Children should have breakfast before going to school.
4. Good tooth care practice is encouraged. Children shall brush their teeth after mealtime and before going to bed.

School 7 (Wad-Thunglom)

1. Students shall not bring crispy snack from home.
2. Students shall not eat snacks in during classroom.
3. The nutrition education programme shall focus on students' eating behaviours.
4. Students' shall not drink soft drink and school shall not provide them.
5. School store shall sell nutritious food, snacks and beverages.
6. Parents shall cooperate to encourage their children eat fruit, Thai desserts and vegetable.

School 8 (Wad-Sripoom)

1. All snacks provided by school shop are nutritious.
2. Teacher encourage children brush their teeth after meal.
3. Children do not bring crispy snack, sweets and gum in during the school session.
4. School encourage children have meal at mealtime.
5. School staff and parents are asked to encourage and practice children to eat vegetable and fresh fruit.

These healthy eating policies were distributed to parents, teachers, and school board member through the second school newsletter. The healthy eating policies from all intervention schools were included in this newsletter. If in a week no one debates, then the policy would be implemented follow the stated policy in each school.

Since no one debated the healthy eating policy for preschool children, the policy implementation started a week later.

4.3.4 Implementation of Healthy eating policy

4.3.4.1 Process of healthy eating policy implementation and activities which conform to the policy

Data from interviewing some headmasters, preschool teachers and preschool parents, observation, and documents revealed that the process of policy implementation has been accomplished by:

1. All intervention schools stated that all projects for promoting healthy eating must conform to the healthy eating policy. For example, nutritional criteria were included which must be considered when planning menus or providing snacks to ensure that the nutritional needs of all students were met and only healthy food and snacks are served.
2. Assigning specific policy implementation roles and responsibilities to teachers, school board members and parents (all stakeholders). Deciding who

would be responsible for distributing the policy, how to distribute tasks and who would be the target groups.

3. The teachers, parents and school board members were educated during the meeting and discussions on the Thai Recommended Dietary Allowances (RDA), edible portions of snacks and nutrient.
4. Informing the teachers, parents, and communities about the policy through school newsletters, village communication, posted in front of the classroom or using face to face communication.

Table 5 illustrates how the policy has been promoted in the intervention schools to increase the coverage of the target groups its reached. All intervention schools communicated the healthy eating policy and activities through school newsletters and face to face method. Two schools reported those activities through village radio stations. Seven schools posted stated policies in front of preschool classroom. All activities aimed to disseminate the healthy eating policies and activities which conform to the policy as wide as possible.

Several activities were launched to conform to the healthy eating policy. They are described in more detail in Table 6.

All schools had nutritional guidelines and distributed them to school cooks, preschool teachers, teachers who responsible for school canteens and shops, and parents. The headmasters used this guideline to educate the parents and school board members during the school meetings while the preschool teachers used it as guideline during

their teaching time. In addition, they advised parents regarding the type of healthy snacks and beverages parents could provide to their kids after schools. Two school shop owners (one was also the school board member and the other was preschool's parent) and five teachers who responsible for school shop changed the menus of snacks and beverages after attending the focus group discussion. Increasing availability of healthy snacks and beverages were found in schools and some parents provided more fruits to their kids.

Regarding nutritional curriculum, most preschool teachers encouraged their children to have healthier eating by tales, songs and dancing. During the policy implementation, the kid's song "Carrot" which advocated children to have more vegetables was very popular among Thai children. Therefore, all schools used this song to motivate the preschool children. The preschool children in one school were responsible for watering the garden in front of their classroom. That school used this strategy to promote nutritional education for young children because school staff believed that it might pass the positive attitude about vegetable to young children. Before the mealtime, most schools used the poem about nutrition to educate children. All schools posted the colourful posters about nutritional education in the classrooms and at the school shops. They also used toys such as vegetables, fruits, kitchen kit, to promote healthy eating behaviour during school session. One preschool teacher use positive method such as praise, and various colourful stamps as reward for her children.

During this research, developing links with local health officers, educational supervisors, dentists, the communities, school staff and parents, regarding nutrition aspects, were established. Local health officers, dental nurse and dentist were supporter in the nutrition education. Such health officers were asked to provide new nutritional news to the parents, school board members and school staff. The educational supervisors were supporter in nutritional curriculum. They were the key persons who monitored the implemented healthy eating policy in each school.

The extra activity regarding healthy school by School 7

After the policy adoption step, School 7 had school staff meeting to discuss a healthy eating behaviour among preschool children. The result of that meeting has shown that they would like to gain consensus about a healthy school policy for all students by using the same method as this study. Then the head master of this school established the focus group discussion. He invited local health officers, school board members, and parents to discuss the existing children behaviour and how to solve the problems. The discussion composed of 4 teachers, 1 local health officer and 21 school board members and parents. They had commitment about improving health behaviour among all students and then stated the healthy policy in these issues: oral health, hair cleanness, obesity and malnutrition children. The previous healthy eating policy for preschool children was a part of oral health policy. As a consequence of this meeting, the school implemented all policies for all children.

4.3.4.2 <u>The results from the focus group discussions during healthy eating policy implementation</u>

During this process, focus group discussions were arranged to discuss about preschool children's behaviour regarding eating, benefits and barriers to implement a healthy eating policy, and future plan of the implementation.

There were 8 focus group discussions among all working groups from the intervention schools. 76 parents and school board members, 16 teachers and 1 health officer were involved in those discussions (Table 7).

Preschool children's eating behaviours

A number of working groups reported that most children changed the type of snacks they bought in the morning from their home to school. But some children still had crispy snacks during the school session. "*Some children take fruits to school, but some of them still take crispy snack*" (Teacher 5). "*I bought bread for my child before taking him to school*" (Mother 12). "*When my daughter eats orange, she does not need a snack*" (Mother 13). Decreasing crispy snack and sugared snack intake were reported by teachers. Despite the decreasing of unhealthy snack was reported, the expense of snacks by children were remain high. The cost of healthy snack such as bread or fruit was higher than unhealthy snack. "*Bread is expensive*" (Mother 14). "*My child didn't buy crispy snack or prohibited snacks but she buy the other snacks such as meatball or sausage instead*." (Mother 15).

When asked how the children felt when they could not buy the snacks such as crispy snack, sweets or even soft drink at schools. Both teachers and parents stated that the

children did not complain anything regarding type of snacks they could buy. Most parents appreciated that the healthy eating policy was successful although children still ate crispy snack at home. "*My son eats (snack) only at home. It shown less frequency he exposed (with crispy snack) per day*" (Father 5). As a consequence of reducing crispy snacks intake at school, at the end of the day, many children had more money after school to buy the snack from a village shop. "*My son buys ice-cream after school*" (Father 6). "*He (son) saves money to buy snack after school*" (Mother 16). "*She didn't bring money to school but she asked me for her money after school*" (Grandmother 5).

A few parents reported that they permitted children to drink soft drink at home on a special occasion such as a birthday party. Many working group acknowledged the high cost of fruits so they provided fruit juice (25% orange or grape) instead.

Barriers and facilitator factors of the policy implementation

As well as developing a healthy eating policy for preschool children, the working group identified difficult aspects of barrier and facilitating factors that change children's diet intake. The roles of school, family, and the community were all nominated as either a benefit or a barrier to children being healthier eating.

Barriers to a healthy eating of preschool children

A majority of working groups reported that the role of parents and peer pressure were the main barriers. Some parents did not encourage their children to have healthy snacks. "*Parents eat (crispy snack) and children eat also*" (Mother 17). "*My brother*

always gives crispy snack as an reward for my children" (Father 6). Concerning this issue, one senior school board member suggested that the role of the parent was very crucial for young children. "*Children's behaviour was shaped by their parents*". (Senior school board member 2).

The child peer pressure was also a barrier for young children. "*Young children want to be like their friends or the elders*" (Mother 17). "*My child has some snack as his friend*" (Mother 18). Therefore, it was difficulty to enforce healthy eating for parents when their children want to conform to what their friends were eating. In addition, the healthy snacks such as bread, fruit were expensive for children. "*I give my daughter 4 baht. She saves 2 baht and buys (snack) 2 baht*" (Mother 19). "*The low price snacks (1 or 2 baht) are sweets, wafer with flavoured, small pack of instant noodle. They are unhealthy*" (Mother 19). "*The fruit which children like are expensive for example orange is about 40 baht/kg or 5 baht/piece*" (School board member 4).

Most working groups recognised that advertising and packaging of unhealthy snacks made them appealing. In addition, new various attractive snacks were regularly distributed to the market from the manufacturers. Due to the fact that many unhealthy snacks are available in the market, some participants said "*We could not fight with the advertising* (Father 6) "*The advertising is the main barrier to the effectiveness of the implemented the healthy eating policy*" (Teacher 5).

Most working groups acknowledged the village shop as a barrier to healthy eating of children. The shop owner frequently presents new attractive snacks for children. The lack of co-ordination between a school, a family, and a community was reported as a major barrier to healthy lifestyle and such barrier was the difficulty of continuous enforcing healthy eating in the village.

Facilitating factors to a healthy eating of preschool children

As a result of prohibiting crispy snacks in schools, increased number of healthy snacks option on school shop menus was reported. Parents and teachers recognised that the physical environment of the school could have an effect on children's healthy eating behaviour. "*We offer bread, fruit and fruit juice in school shop* (Head master 4). "*The village shop owner complained that the snack sale has been decreased*" (Teacher 7). "*My child bought Thai desserts instead of crispy snack and I instruct her to buy nutritious snacks from school shop*" (Mother 19).

Reward was reported as a good facilitator for developing a healthy eating behaviour of young children. "*I used stamp with animal figures and praise them when children bring fruit to school*" (Teacher 6).

During the research study, the song "Carrot" was very popular among young children. Parents and teachers indicated a significant role of this song. "*My daughter eats more vegetable because of this song (Carrot song)*" (Mother 20). "*Children always sing a Carrot song in the class and they enjoy it*" (Teacher 7).

Most participants agreed that parents played a major role in encouraging children's behaviour regarding healthy eating. When asked the parents why some preschool children ate healthier snacks, the answers from most parents and teachers were that changing behaviour of children came from (1) a result of providing healthy food and snack selection, (2) regularly encouraging positive messages about healthy snacks by the parents and (3) training their children about healthy food through meal at home. "*Due to the fact that parents practice their children and encouraging healthy nutrition message to children, the children are changing the eating habit. Moreover, our school provide only nutritious food and snack*" (Head master 5). "*I regularly encourage them (two daughters) to eat more vegetable and fruit*" (Mother 21).

Parent acknowledged professional (doctor, dentist, and teacher) pressure as a major facilitator to healthy eating of their children, "*Children didn't buy snack because teacher taught him that it (crispy snack) is unhealthy and the dentist (researcher) also told the teacher like this*" (Mother 22). "*They (children) remember only what the teacher taught*" (Mother 23). "*Decreasing snack intake because of the teacher instruction*" (Father 7). However, the co-ordination between the school staff, the family and health officers was considered to be an important factor to encourage healthier lifestyle of young children. "*Doctor should instruct us about health care*" (Mother 24). "*Teachers advise the children (what nutritious food)*" (Mother 25). "*Family trains them (children) at home*" (Teacher 6). "*The co-ordination between the school and the parents is important*" (Grand mother 2). " *All of us should work together*" (Mother 25).

Communication to all stakeholders

When asked the working group regarding what was the best method to communicate to other parents, all parents indicated that the best communication was the focus group discussion. During the focus group discussion, parents can share experiences with other participants such as the school staff, other parents, local health officers, and the school board members. In addition, they can obtain the schools news and health news at the same time. The face to face communication from parents to parents can be useful sometimes, but it was inappropriate for the health issue. "*Some parents who aren't here (at the meeting), they do not obey the rule or believe what we have proposed*" (Mother 25). Some school staffs suggested that the members of the working group should encourage the parents to place their concern over the children healthy eating's behaviour by using several strategies (such as inviting the parents in school meeting). "*Key man should co-operate in reinforcing them (parents) to concern about their children health*" (Teacher 6). "*I will invite all of the parents to participate in the meeting about this project (healthy eating of children)*" (Head master 6).

Further activities

All of working groups recognised that they should coordinate to initiate further activities which conform to the existing policy. They would like to include more activities regarding assessing the nutritional status of children and healthy eating behaviour. Regarding the existing healthy eating activities, they believed that the coordination from all sectors was the main facilitating factor to encourage and support the activities. Therefore, all further activities should be a consensus from all sectors

to ensure that all participants are the owner of those activities. In addition, to avoid the effect of child peer pressure, most schools agreed that the target groups under this healthy policy should involve all school children in all classes because preschool children spent most of the time with older children and there was a strong influence of peer interaction at school. Moreover, there were consensuses amongst the working groups in each school that more activities related to healthy behaviour needed to start at the early life of the child, before they reach the school age.

4.3.4.3 Different dimensions of policy implementation influencing the implemented healthy eating policy for preschool children

The analysis of how different dimensions of policy implementation influence the implemented healthy eating policy for preschool children was based on the modified of four dimensions of policy implementation (Cooper *et al.*, 2004) as described in the definitions of this study.

Normative dimension

Value or belief which drived all stakeholders in this study to seek health behaviour improvement and change of preschool children was love. Parents from all the intervention schools made value of children's health as love from them. Children's health was valued by the activities which make children healthier and the way they grow up with good health as well as being smart. Such values could encourage parents to set a goal that their children must be healthy by eating healthy food and snack. For this reason, they needed to find some strategies which can lead them to

reach that goal. Thus, they were willing to develop and implement the healthy eating policy. To support this reason, the results from the policy selection by the representative of parents and conclusion of parents' view during the policy advocacy showed that most parents believed that if young children have healthy food and snack in their early life, they would grown up to be a healthy young individual who would be intelligence and cheerful as phrase "You are what you eat". Additionally, adults feel responsible for a child's health. Base on these beliefs; the process of healthy eating policy was implemented without debate.

Constituentive dimension

In this dimension, healthy eating policy for preschool children was formed by the constituent groups. There are many sectors in one community who influence, participate in and benefit from the healthy eating policy for preschool children.

Parents

Parents played a major role in implementing a healthy eating policy. They were an initial group for selecting the policy. Because of the fact that young children were not capable to decide or practice in some healthy activities such as food selection, the parents was the significant factor to persuade young children to improve and change their health behaviours.

Headmaster

For all activities in school, headmaster played a major role in the planning, decision, implementing and evaluation process. For example, school 7, the headmaster was so keen, very active and very powerful. He could apply several methods used in this research (focus group discussion, some tricks which the researcher used in his area) to develop a health policy in this school. He had extended the policy to all school children and involved other issues such as oral health policy, hair hygiene policy by gaining the participation from all parents, teachers, school board members and local health officers. In addition, he established non-health related activities which conform to the healthy policy such as watering the garden activity for preschool children which can help to advocate young children regarding the nutritional aspect.

Preschool teacher

Preschool teachers were the person who spent most of time with the children during the school session. They had the power to establish positive and supportive environments by giving an instruction and education that allow young children to develop good eating behaviour and attitude. Additionally, the preschool teachers can help the parents to understand this healthy eating issue by providing some positive nutrition information. From this study, the preschool teachers were very important in policy advocacy, policy adoption and policy implementation processes. They played the role as the supporters and the implementers in the policy making processes. For example, school 6 which had no headmaster to administer at the beginning of the policy making process, could be managed to formulate the policy by other teachers as

those done in other intervention schools. It revealed that non-administrative teachers could also play a major role in implementing healthy eating policy.

School board member

To achieve the goal of healthy eating policy in school, school board members were the reinforcement. Most of them were retired teachers or former community leaders. Their opinions were significant and accepted as the leading opinions for the communities. In addition, some school board members had good social network with other organization outside the schools such as the local authority that can support the budget for the school meal.

Health officers

Health officers such as local officers and dental nurses were the crucial persons in supporting health issue. The health instruction from these persons was very powerful to the community. In this research, the health officers were the participants of the health policy working group but they were not the main decision maker. Their works were health instructor and encouraged the parents, the school staff, the school board members and the community to more concern about improving children's health behaviour. Main decision regarding what the working group should do for the children was belong to the parents and school staffs.

School shop owners

Most intervention schools had school shops and operated by the teachers but school 5 was undertaken by the other who was also the school board members. His role was

significant for implementing healthy eating policy for school children. After participated in the policy working group, he changed the menu of snacks and beverages in school canteen. Increasing fruits, bread, nut and meatball were provided in this school.

In other schools where the teachers operated the school shop, 4 schools changed the menus of snacks and beverages in the school shop while the other 3 schools changed only types of snacks provided. Sugary drinks such as 25% fruit juice were still provided in the school shops.

Educational supervisors

All school activities are monitored and assessed by the provincial educational supervisors. They played the monitoring role during the healthy eating policy making process. Based on the fact that the educational supervisor had the responsible to evaluate the performance of the school headmasters and supervised all teachers regarding education, the educational supervisor can force the headmaster and school staff to implement the policy.

Structural dimension

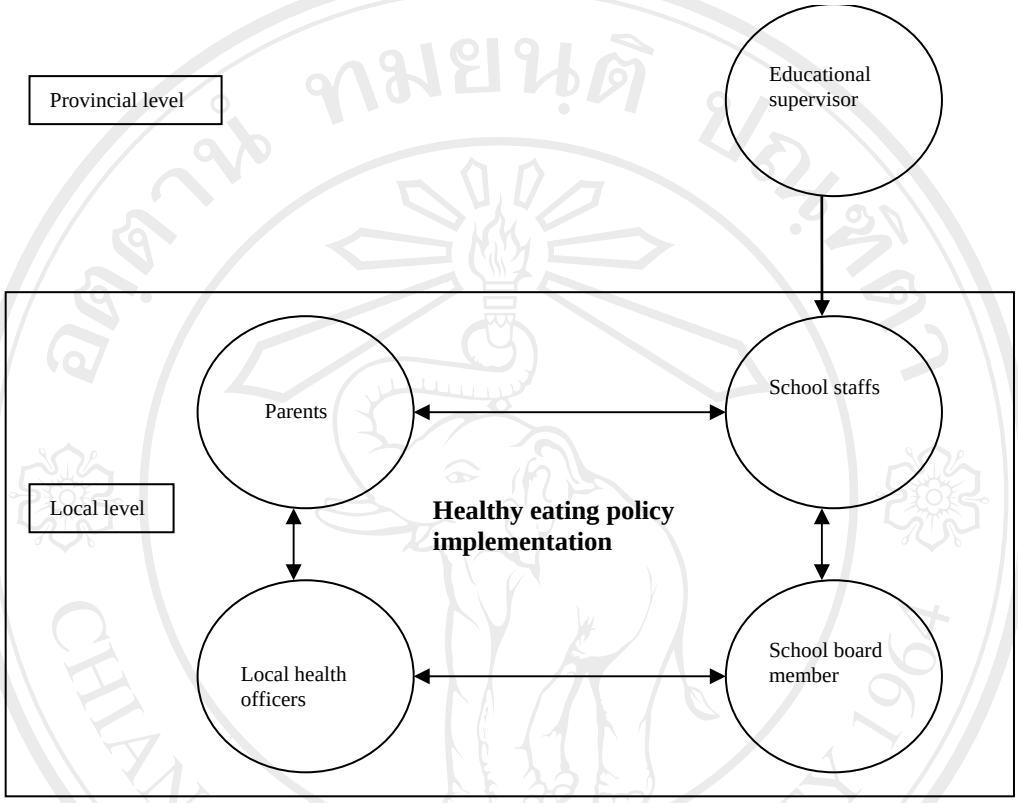

Figure 2 Relationship of the working group for implementing the policy

From the analysis of the working group structure in this study, the role of each stakeholder in the working groups such as the headmasters, preschool teachers, parents, school board members, and the local health officers, were on the same level. They respected the roles of the others and did not try to play the role above the others. For example, the most initial and crucial persons in this process were parents. School staffs, school board members and local health officers could not force the parents to accept or concern about the policy. Most healthy eating policies were drafted by the

parents while the other sectors were the reinforcement in relation to some aspects such as the curriculum development (school staff), health issues (local health officers), and the management in the village (school board members). At the same time, the top-down structure figure such as the educational supervisor and school staff could support the policy implementation.

Technical dimension

Selecting the right problem to work with was very significant to the developing process of the policy. In addition, practical and feasible policy which built and implemented by all stakeholders was very powerful. The main objective of the healthy eating policy for preschool children in the intervention schools was to decrease the consumption of crispy snacks. Increasing snack intake among young children was the major problem for parents at that time because they spent a lot of money for crispy snacks daily. Moreover, the parents realised that crispy snacks were unhealthy but they did not have the appropriate strategies to decrease such snacks intake by preschool children. Those were the reasons why the parents were willing to adopt and implement the policy. Additionally, the working groups started implementation by simple activities, for example, use the policy as control at school and home, use praise as reward. There were no cost for these activities and the strategies to delete something intake was easier than encouraging to eat.

4.3.5 Healthy eating policy evaluation

In this part, the hypothesis as mention in Chapter 1: the intervention schools had better diets and practices in school policies than the control schools, was tested. The results of the hypothesis test are shown in 4.3.5.1 and 4.3.5.2.

4.3.5.1 The assessment of healthy eating policy for preschool children

The questionnaire included topics grouped in 5 dimensions relating to healthy activities: (1) policy and environment; (2) curriculum and instruction; (3) staff, family and community involvement; (4) programme coordination; and (5) evaluation. Each topic was categorised and scored as: (a) '3' (fully in place); (b) '2' (partially in place); (c) '1' (currently under development); and (d) '0' (not in place). All scores related to existing policy implementation were then added up. The sum was counted as total scores of the existing implemented policy. At the evaluation period, for each topic, the score which changed from higher to lower number (i.e. 3 points to 1 point) was categorised as 'negative policy change' and enumerated regardless their magnitude as '1 point'. Conversely, changing from lower to higher number (i.e. 0 point to 3 points) was categorised as 'positive policy change' and enumerated '1 point' as well. According to the assessment of the existing healthy eating policy for preschool children, the results of the assessment in both groups are described in Table 8-10.

The mean total scores of the existing implemented healthy eating policy for preschool children, and the mean points of policy changes are shown in table 8. At evaluation period, the mean total scores increased from 55.25±2.49 to 61.63±3.25 in the intervention schools, and increase from 53.50± 2.73 to 57.13±7.06 in the control schools. In the intervention schools, the mean point of negative policy change was lower than in the control schools (Table 8). Consistently, the mean point of positive policy change in the intervention schools was higher than the control schools (Table 8).

Regarding the details of implemented healthy eating policy, 6 intervention school cooks did not have guideline for healthy eating in preschool children at evaluation period. In addition, 5 of the intervention schools did not provide adequate nutrition and food service training course to their staffs. 4 of these schools currently were under development in communicating healthy eating policy to all stakeholders. While 5 intervention schools partially offered healthy food and discouraged sugar added food and did not establish a plan of health promotion activities for students and staff. Moreover, most intervention schools (6 schools) had strategies for healthy eating outside schools partially in place as well as 4 intervention schools provided and promoted healthy eating choice through the school canteen (Table 9).

At an evaluation period, all the cooks in the control schools did not have guideline for healthy eating in preschool children. A majority of control schools (6 schools) did not have guideline for healthy eating. Moreover, most control schools (5 schools) did not provide staff involved in nutrition with adequate and ongoing in service training that

focuses on teaching strategies for promoting healthy eating behaviour. Considering for category of "partially in place" activities, 6 control schools has written school healthy eating policies, offered healthy food and discouraged sugar added food, and had strategies for healthy eating outside school. In the same category, 5 control schools provided and promoted healthy eating choice through the school shops and had established a plan of health promotion activities for student and staff (Table 10).

Table 11 shows details in policy changes of schools in the intervention group. The policy implementation in school 1 was negatively changed in 3 points and positively changed in 5 points. There were 3 negative changes and 7 positive changes found in policy implementation of School 2. The results showed 2 negative changes and 5 positive changes in policy implementation of School 3. The most of points in positive change was shown in school 4 (8 points) and also showed 3 points in negative change in this school. The policy implementation in School 5 changed 3 points negatively and 4 positively. School 6 had one negative change but 5 points of positive changes. School 7 and School 8 had one negative change and 6 positive changes but different in details.

In control group (Table 12), there were 1 negative change and 4 positive changes of policy implementation in school 9. The school 10 showed 3 points of positive and negative in policy implemented changing. Two negative changes and 4 positive changes in policy implementation were found in school 11. The school 12 was negatively changed in 2 points and positively changed in 3 points. The worst case of negative change was shown in school 13 where 8 negative changes found. This

school positively changed in 3 points. One negative change of policy implementation was found in school 14 but large of positive changes were also found in this school (6 points). There were 4 points of both positive and negative change of policy implementation in school 15. In school 16, 2 negative and 5 positive changes were found.

4.3.5.2 The assessment of preschool children's dietary intake

At the evaluation period, 219 preschool children participated through the research, 6 children moved to other provinces with their parents and 9 children did not take part in the evaluation period. The results compared the 219 children who were assessed in both periods of the study.

Characteristics of preschool children attending schools developing and not developing the healthy eating policy

Age and sex

Age Forty-five per cent of children aged 4 year were in control school and 46.7 % were in intervention schools. There were 54.8% and 53.3% of 5 year-old in control group and intervention group, respectively (Table 13).

Gender There were 43 boys and 41 girls in control schools and 68 boys and 67 girls in the intervention schools (Table 13).

Socio-economic status and household size

To measure socio-economic status and family size, information was collected regarding the level of education of the head of the family, occupation of the family, family income and family size.

Level of education The majority of the parents had no more than secondary school level education. More than 50 % of fathers in both intervention and control schools had primary school level education. 40.5 % of fathers in control schools had secondary school level while 44.4 % of fathers in the same level were found in the intervention schools. Most of mothers in both groups had primary school level education. 31.0 % of mothers in control schools and 28.9 % of those in intervention schools had secondary school level education, respectively (Table 14).

Occupation of the parent A majority of parents in both control and intervention groups were labourer (Table 14). 17.9 % of fathers in control school and 21.5 % of fathers in intervention school were farmer. 27.4 and 35.9 % of mothers in control and intervention schools, respectively, were farmer (Table 14).

Household size The majority of students in both groups lived in a family of 4 or 5 or more persons (Table 14).

Family income The average incomes per month of most families in control and intervention schools were lower than the average income of families in the province (Table 14).

Daily pocket money of children More than half of children in each group took money to school; no more than 10 baht (US $ 0.25) each day (Table 14).

Dietary intake at school

All snacks were grouped (Table 15). For example, 25% fruit juice, soft drinks, flavoured milk with sugar, drinking yoghurt with sugar, sugar containing drinks and ice cream were grouped into sugary drinks. In addition, all snacks containing sugars were identified and summed together to give a total frequency of cariogenic foods, snacks, confections and drinks.

The mean frequencies of snack consumption, which included cariogenic snack, fresh fruits, crispy snacks, Thai desserts, and sugar-containing drinks, of school children in each group is shown in Table 16. At baseline and 9 months evaluation examination, there was a statistically significant difference between frequencies of cariogenic snack eating in both control and intervention schools. The intake frequencies increased from 1.03±0.73 to 1.39±0.86 times per day in the control group. On the other hand there was a decrease from 1.12±0.79 to 0.84±0.58 times per day in the intervention group. There were no significant differences between the baseline and evaluation period intakes in the mean daily frequencies of fresh fruits, Thai desserts and sugary drinks in control schools. At the 9 month evaluation, the mean frequencies of intakes per day of cariogenic snacks (from 1.03 to 1.39), crispy snacks (from 0.67 to 1.10) and non-sugar milk intake increased significantly in the control group (Table 16).

Non-sugar milk frequencies were not significantly different between the baseline and at 9 months in the intervention schools. But the intake of cariogenic snacks (from 1.12 to 0.84), fresh fruit, Thai desserts (from 0.23 to 0.13), crispy snacks and sugary

drinks (from 0.31 to 0.23), decreased significantly from before to after introducing the healthy eating policy in these schools (Table 16).

In the intervention schools at baseline, the mean daily intake of Thai desserts, crispy snacks and sugary drinks were significantly higher than the control schools (Table 17). At the evaluation process, the mean daily intakes of fresh fruits, non-sugar milk and sugary drinks in control group and intervention group were similar, except for cariogenic snacks and crispy snacks intake, which were significantly lower ($p<0.05$) in the intervention group than in the control group. However, the frequency of intake of Thai desserts was significantly higher in the intervention schools than in the controls (Table 17).

4.4 A model to implement a healthy eating policy in school

A model to implement a healthy eating policy for preschool children was proposed by the researcher. It was formalised based on the barrier and the facilitating factors, steps of policy implementation, and activities that had the impact on the healthy eating policy implementation in those 8 intervention schools in this study. The model illustrated in Figure 3 identifies 5 stages linking inputs to implement the policy. First stage is a multi-stakeholder collaboration. Second stage is setting ambitious goal by all key persons. Public commitment is established, consequently. Then, the policy is implemented. In this stage, there are many factors which influence the implementation. All of these factors should be concerned in order to achieve the goal. Final stage is periodic evaluation and adjustment.

4.4.1 Multi-stakeholder collaboration

Key persons in implementing a healthy eating policy for preschool children

An initial significant factor to develop a healthy eating policy was a multi-stakeholder collaboration. The main key persons were parents, school staff (head master, teachers who responsible for school canteen or shop, preschool teachers and school cooks), and school board members. The collaboration between those groups could push the process of policy development. Local health officers, dental nurses or dentists acted as advocators or supporters in encouraging and educating nutritional aspects. In addition, they are supplier for health messages and health education when the community needs. On a common sense, the support from professional especially medical professional is particularly important for communities to ensure that they run in the right way of health issues. To achieve implementing healthy eating policy for preschool children, the educational supervisor should play an active monitoring role regarding school healthy eating activities. Due to the fact that all schools are under supervised by the provincial educational supervisor, it is necessary to involve these educational supervisors in this process. In addition, regarding the school curriculum or school activities, the educational supervisors play a major role in educate, advise monitor and assess the teachers. Alliance building across sectors to implement the healthy eating policy is a necessary component to developing the policy.

4.4.2 Setting ambitious goals

To achieve a success in any health project, the goal setting is very important especially a goal which could drive a society to seek improvement and change. To improve health and oral health of young children, reducing unhealthy snack intake such as crispy snack or chewing gum was the major goal for parents, school staff and school board members. The goal which is feasible and aim at the beloved person could be able to achieve more rapidly.

4.4.3 Public commitment

In order to achieve the goal, all stakeholders should establish public commitment before any implementation. The collaboration between key persons is significant in order to move on to the next step. Moreover, the written policy should be stated in some of the school document or place publicly to announce the commitment, for example, post it in front of the classroom, stating in school newsletters, and reporting through the village radio station. All activities regarding nutritional aspects should be announced that they must be conformed to the policy. Assigning specific policy implementation roles and responsibilities to teachers, school board members and parents (all stakeholders) during the meeting are very significant strategy to be concerned. Because it is an announcement to the community and may be a commitment that such people are a part of this process and willing to implement any activities which conform to the healthy eating policy.

4.4.4 Implementation of healthy eating policy for preschool children

To achieve a goal, barrier and facilitating factors should be concerned during policy implementation. It is suggested that the implementation could be influenced by these factors.

Barrier factors to implement a healthy eating policy

During an implementing process of a healthy eating policy for preschool children, there were many barriers factors which need to be emphasised. First factor was the role of parents. The parent role plays either a barrier or a facilitating factor to the implementing process. Parents could be a barrier if neither encourage nor practice children about eating healthy food and snack at home. Changes of children behaviours could not solely depend on the school. Secondly, Preschool children can be influenced by friends at school. They feel secure if they eat familiar food or snack. If someone have unhealthy snack, they will share to the other. Thirdly, physical environment such a variety of attractive unhealthy snack or a small number of healthy snack choices with low price in the market was a significant problem to implement a healthy eating policy. In addition, advertising of new attractive unhealthy snacks were promoted to young children. This was a strong barrier to implement the policy. Finally, the lacks of coordination of all stakeholders in some activities had an effect on the policy implementation. For example, some parents did not concern about the important of healthy snacks while the school encouraged children to concern about this aspect. There was an inconsistency of policy implementation among

stakeholders. Therefore, the conflict of interest made the implementing process less powerful.

Facilitating factors to implement a healthy eating policy

To facilitate the implementation, the parent roles should be in consistant with the other stakeholders. Their roles should be conformed to the policy. The professional pressure from a doctor, a dentist, a dental nurse, a local health officer, and a teacher were particularly important for parents and children to change their health behaviour. Most young children and even the adults trust in health professionals that they are specialist in health aspect. If they do follow the instruction, they will get better health. In addition, teachers can influence the children's habit and change children's unhealthy practice at school. Increasing a various healthy snack choice available at school to all children might be training young children about healthy snack selection and changing their behaviour to have healthier snacks in later year. The major facilitating factor to implement the healthy eating policy was a long term and close developmentally appropriate was powerful to encourage young children to be positive with healthy food during school time.

4.4.5 Evaluation and adjustment a healthy eating policy

When implementing the healthy eating policy, periodic evaluations and adjustment were particularly important to ensure that the goal could be reached. If some implementing processes were weak, those processes could be altered or adjusted at an appropriate time.

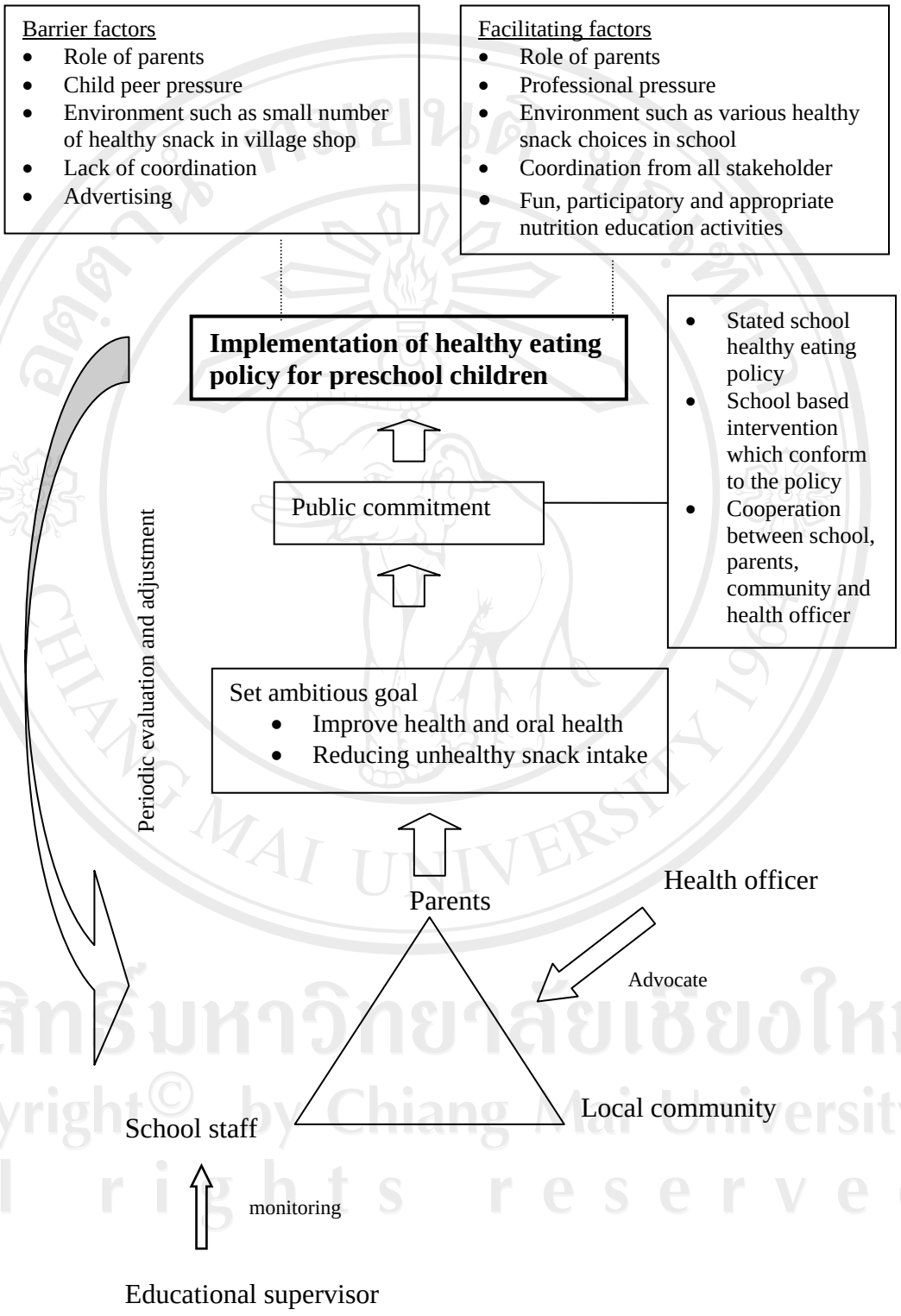

Figure 3 A model to implement a healthy eating policy in school

Table 1 The existing school food policies implemented in public schools in Amphur Muang, Phrae Province, Thailand.

Topics	% of schools (N)			
	Fully in place (N)	**Partially in place (N)**	**Currently under development (N)**	**Not in place (N)**
Policy and Environment				
1. School has written school healthy eating policies.	57.4 (27)	36.2 (17)	6.4 (3)	0.0
2. School offers healthy food and discourages food added sugar.	17.0 (8)	78.8 (37)	2.1 (1)	2.1 (1)
3. School offers healthy drink.	85.1 (40)	12.8 (6)	0.0	2.1 (1)
4. School offers healthy snack.	83.0 (39)	12.8 (6)	0.0	4.2 (2)
5. School offers sugarless milk.	100 (47)	0.0	0.0	0.0
6. School has guideline for healthy eating in preschool children.	17.0 (8)	8.5 (4)	0.0	74.5 (35)
7. School cooks have guideline for healthy eating in preschool children.	6.4 (3)	0.0	0.0	93.6 (44)
8. School has strategies for healthy eating outside school.	10.6 (5)	89.4 (42)	0.0	0.0
9. School provides and promotes healthy eating choices through the services of school canteen or tuck shop.	53.2 (25)	44.7 (21)	0.0	2.1 (1)
10. All students have time to eat lunch in clean, safe and pleasant environment.	100 (47)	0.0	0.0	0.0
11. All teachers schedule time for students to wash their hands before meals and snacks.	100 (47)	0.0	0.0	0.0
12. School has established links with professionals who can provide counselling for nutritional problems.	100 (47)	0.0	0.0	0.0
13. School has established a plan of health promotion activities for students and staff.	63.8 (30)	27.7 (13)	0.0	8.5 (4)
14. School communicates healthy eating policies to all stakeholders.	14.9 (7)	31.9 (15)	51.1 (24)	2.1 (1)

Table 2 The existing school food and nutrition curricula for preschool children

Topic	% of schools (N)			
	Fully in place (N)	**Partially in place (N)**	**Currently under development (N)**	**Not in place (N)**
Curriculum and Instruction				
1. School helps students learn specific nutrition-related skills.	100 (47)	0.0	0.0	0.0
2. School provides nutrition education activities that are fun, participatory, developmentally appropriate and culturally relevant.	66.0 (31)	34.0 (16)	0.0	0.0
3. School emphasises the positive, appealing aspects of healthy eating rather than the harmful effects of unhealthy eating.	44.7 (21)	55.3 (26)	0.0	0.0

Table 3 The involvement of staff, family and community in nutrition education and food policies in schools

Topic	% of schools (N)			
	Fully in place (N)	**Partially in place (N)**	**Currently under Developed (N)**	**Not in place (N)**
Staff, Family and Community Involvement, Programme Coordination and Evaluation				
1. School provides staff involved in nutrition with adequate and ongoing in service training.	40.4 (19)	4.3 (2)	2.1 (1)	53.2 (25)
2. School has collaboration between food service staff and teacher.	85.1 (40)	2.1 (1)	0.0	12.8 (6)
3. School encourages and involves family members in supporting and reinforcing nutrition education.	55.3 (19)	4.3 (2)	0.0	40.4 (19)
4. School encourages and involves the community in supporting and reinforcing nutrition education.	51.0 (24)	0.0	0.0	49.0 (23)
5. School encourages and involves family members in supporting and reinforcing healthy eating policy.	100 (47)	0.0	0.0	0.0
6. School encourages and involves the community in supporting and reinforcing healthy eating policy.	100 (47)	0.0	0.0	0.0
7. School coordinates food service with nutrition education and other components of school health programme.	83.0 (39)	12.8 (6)	0.0	4.2 (2)
8. School regularly evaluates the effectiveness of its programmes and curricula.	100 (47)	0.0	0.0	0.0

Table 4 Distribution of focus groups and participants

Location	Number of focus groups	Number of participants	Number of parents and school board members	Number of teachers	Number of local health officers
Ban-Rong-fong	1	13	5	7	1
Ban-Pun-Chueng	1	14	11	2	1
Ban-Nam-Cham	1	19	15	3	1
Ban-Nai-Wiang	1	9	6	2	1
Ban-Su-Pan	1	8	7	1	0
Ban-Mae-Lai	1	9	6	2	1
Wat-Tung-Lom	1	12	10	2	0
Wat-Sri-Pum	1	11	8	3	0

Table 5 The processes of promoting the healthy eating policy for preschool children

Key component	**Targets**	**Implemented processes**
The healthy eating policies from all intervention schools.	Educational supervisors, local health officers, teachers, school board members, parents.	Stated policies in the newsletters.
The school news included the healthy eating policy for preschool children.	Teachers, school board members, parents, elementary students.	Stated policies in the newsletters.
The school news included the healthy eating policy for preschool children.	As above, plus the communities.	Report through village radio station.
The healthy eating policy	Teachers, school board members, parents, elementary students.	Posted in front of preschool classrooms.
The healthy eating policy	Parents, students	Face to face communication.

Table 6 Outline of activities launched in the intervention schools

Target group	Activities	Supports
School cooks Preschool teachers Teachers who responsible for school canteens and shops Parents	• Nutritional guidelines for preschool children and older children. • Advising on snacks and beverages at school. • Availability of healthy snacks at school shop and home.	• Local health officers • Dental nurse • Dentists • Parents and families • Communities
Preschool children	• Encourage nutrition in school curriculum o Tales o Songs o Dancing o Watering the vegetables in the school garden o Rote learning about nutritional • Production of appropriate nutrition resources o Colourful posters o Toys • Awards o Praise o Animal, food or star colour stamps	• Teachers • Parents • Students • Educational supervisors • Governors
Teachers Parents Local health officers School board members	• Focus group discussion regard to diet behaviour of preschool children.	• Headmasters • The communities
Public	• Develop links with local health officers, educational supervisors, dentists, the communities, school staff and parents, regarding nutrition aspects.	• Local authority • School staff • Provincial educational supervisors • Local health officers • The communities

Table 7 The distribution of the participants in focus group discussion

Location	Number of focus groups	Number of participants	Number of parents and school board members	Number of teachers	Number of health officers
Ban-Rong-fong	1	13	11	2	0
Ban-Pun-Chueng	1	18	15	2	1
Ban-Nam-Cham	1	12	10	2	0
Ban-Nai-Wiang	1	12	10	2	0
Ban-Su-Pan	1	9	7	2	0
Ban-Mae-Lai	1	9	7	2	0
Wat-Tung-Lom	1	8	6	2	0
Wat-Sri-Pum	1	12	10	2	0

Table 8 The mean total scores of the existing implemented healthy eating policy, and the mean points of policy changes in intervention schools and control schools

	Intervention schools (N=8)	Control school (N=8)
Total scores (Baseline) **x±SD**	55.25±2.49	53.50± 2.73
Total scores (Evaluation) **x±SD**	61.63±3.25	57.13±7.06
Negative policy change (points)		
x±SD	2.13±0.99	2.88±2.30
Maximum	3	8
Minimum	1	1
Positive policy change (points)		
x±SD	5.75±1.28	4.00±1.07
Maximum	8	6
Minimum	4	3

Table 9 - The changes of the policy implementation during 1 year research in the intervention schools

	Pre-Intervention				**Post-Intervention**			
	Fully in place	**Partially in place**	**Currently under development**	**Not in place**	**Fully in place**	**Partially in place**	**Currently under development**	**Not in place**
School 1(Baan-Rong-Fong)	3, 4, 5, 9, 10, 11, 12, 13, 15, 16, 19, 20, 21, 22, 23, 23, 25	1, 2, 8, 17, 24		6, 7, 14, 18	1**, 3,4, 5, 6**, 9, 10, 11, 12, 15, 16, 17**, 19, 22, 23, 24**, 25	2,8,13*	14**	7, 18, 20*, 21*
School 2 (Baan-Pun-chueng)	1, 3, 5, 9, 10, 11, 12, 13, 15, 19, 22, 23, 25	2, 4, 6, 8, 16, 17	14	7, 18, 20, 21, 24	1, 3, 4**, 5, 10, 11, 12, 15, 16**, 17**, 18**, 19, 20**, 21**, 22, 23, 24**, 25	2, 8, 9*, 13*	14	6*, 7
School 3 (Baan-Nam-Cham)	4, 5, 9, 10, 11, 12, 13,15,16,20, 21, 22, 23,25	1, 2, 3, 8, 17	14	6, 7, 18, 19, 24	1**, 3**, 4, 5, 9, 10, 11, 12, 15, 17**, 20, 21, 22, 23, 24**, 25	2, 8, 13*, 14**, 16*		6, 7, 18, 19
School 4 (Baan-Nai-Wiang)	3, 5, 9, 10, 11, 12, 15, 16, 18, 19, 22, 23, 23, 24, 25	1, 2, 4, 8, 13, 17	14	6, 7, 20, 21	1**, 2**, 3, 4**, 5, 6**, 7**, 10, 12, 15, 17**, 18, 19, 20**, 21**, 22, 23, 24, 25	8, 9*, 13, 16*	14	11*
School 5 (Baan-Supan)	4, 5, 9, 10, 11, 12, 13, 15, 16, 17, 18, 20, 21, 22, 23, 24, 25	1,2,8	14	3,6,7,19	1**, 2**, 5, 9, 10, 11, 12, 13, 15, 16, 17, 19**, 20, 22, 23, 24, 25	3**, 4*, 8	14	6, 4, 18*, 21*
School 6 (Baan-Maelai)	1, 4, 5, 10, 11, 12, 15, 16, 19, 20, 21, 22, 23, 24, 25	3, 8, 9, 13, 14, 17	2	6, 7, 18	2**, 3**, 4, 5, 6**, 9**, 10, 11, 12, 15, 16, 17**, 19, 20, 21, 22, 23, 24, 25	1*, 8, 13, 14		7, 18
School 7 (Wad-Thunglom)	1, 3, 4, 5, 9, 10, 11, 12, 15, 16, 19, 22, 23, 25	2, 8, 13, 17, 24	14	6, 7, 18, 20, 21	1,3, 4, 5, 10, 11, 12, 13**, 14**, 15, 16, 17**, 19, 20**, 21**, 22, 23, 24**, 25	2, 8, 9*		6, 7, 18
School 8 (Wad-Sripoom)	1, 3, 5, 10, 11, 12, 13, 15, 18, 19, 22, 23, 24, 25	2, 6, 8, 9, 16, 17	14	4, 7, 20, 21	1, 3, 4**, 5, 10, 11, 12, 13, 14**, 15, 16**, 17**, 18, 19, 22, 23, 24, 25	2, 8, 9	20**, 21**	6*, 7

***** = Negative changes ****** = Positive changes

Table 10 - The changes of the policy implementation during 1 year research in the control schools

	Pre-Intervention				**Post-Intervention**			
	Fully in place	**Partially in place**	**Currently under development**	**Not in place**	**Fully in place**	**Partially in place**	**Currently under**	**Not in place**
School 9(Baan-Tung Hong Tai)	3, 4, 5, 9, 10, 11, 12, 15, 16, 17, 20, 21, 22, 23, 24, 25	1, 2, 8	14	6, 7, 13, 18, 19	3, 4, 5, 6**, 10, 11, 12, 15, 16, 17, 18**, 19, 20, 21, 22, 23, 24, 25	1, 2, 8, 9*, 13**, 14**		7
School 10 (Wad-Nam Kong)	3, 4, 5, 9, 10, 11, 12, 15, 16, 22, 23, 24, 25	1, 2, 8, 17	14	6, 7, 13, 18, 19, 20, 21	3, 4, 5, 10, 12, 15, 17**, 22, 23, 24, 25	1, 2, 8, 9*, 11*, 13**, 16*, 19**	14	6, 7, 18, 20, 21
School 11 (Wad-Muang-Kha)	3, 4, 5, 9, 10, 11, 12, 15, 16, 19, 22, 23, 24, 25	1, 2, 8, 13, 17	14, 18	6, 7, 20, 21	3, 4, 5, 6**,10, 11, 12, 14**, 15, 17**, 19, 22, 23, 24, 25	1, 2, 8, 9**, 13		7, 16* ,18*, 20, 21
School 12 (Huay-Mah)	1, 3, 5, 9, 10, 11, 12, 15, 16, 17, 19, 22, 23, 24, 25	2, 4, 8	14	6, 7, 13, 18, 20, 21	1, 3, 5, 10, 11, 12, 13**, 14**, 15, 16, 18**, 19, 20, 21,22, 23, 24, 25	2, 4, 8	17*	6, 7, 9*
School 13 (Baan-Pong)	1, 3, 4, 5, 9, 10, 11, 12, 15, 16, 20, 21, 22, 23,	2, 8, 13, 17, 24	14	6, 7, 18, 19	5, 10, 12, 13**, 15, 16, 17**, 19**, 22, 23, 24, 25	1*, 2, 3*, 4*, 11*	14	6, 7, 8*, 9*, 18, 20*, 21*
School 14 (Mae-Kam)	2, 3, 4, 5, 10, 11, 12, 15, 17, 19, 20, 22, 23, 24, 25	1, 8, 9, 13, 16	14	6, 7, 18, 21	1**, 2, 3, 4, 5, 8**, 10, 11, 12, 13**, 14**, 15, 16**, 19, 20, 21**,22, 23, 24, 25	9, 17*		6, 7, 18
School 15 (Hua-Fai)	3, 4, 5,10, 11, 12, 13, 15, 17, 19, 22, 23, 24, 25	6, 8, 16, 18	1,14	2, 7, 9, 20, 21	3, 4, 5,10, 11, 12, 15, 16**, 17, 19, 20**, 21**, 22, 23, 24, 25	1**, 8, 13*	14	2, 6*, 7, 9, 18*, 19*
School 16 (Baan-Dong)	1, 3, 4, 5, 9, 10, 11, 12, 13, 15, 19, 22, 23, 24, 25	2, 8, 14, 16, 17		6, 7, 18, 20, 21	3, 4, 5,10, 11, 12, 15, 16**, 18**, 19, 20**, 21**,22, 23, 24, 25	1**, 2, 8, 9*, 13*, 14, 17		6, 7

***** = Negative changes ****** = Positive changes

Note

1. School has written school healthy eating policies.
2. School offers healthy food and discourages food added sugar.
3. School offers healthy drink.
4. School offers healthy snack.
5. School offers sugarless milk.
6. School has guideline for healthy eating in preschool children.
7. School cooks have guideline for healthy eating in preschool children.
8. School has strategies for healthy eating outside school.
9. School provides and promotes healthy eating choices through the services of school canteen or tuck shop.
10. All students have time to eat lunch in clean, safe and pleasant environment.
11. All teachers schedule time for students to wash their hands before meals and snacks.
12. School has established links with professionals who can provide counselling for nutritional problems.
13. School has established a plan of health promotion activities for students and staff.
14. School communicates healthy eating policies to all stakeholders.
15. School helps students learn specific nutrition-related skills.
16. School provides nutrition education activities that are fun, participatory, developmentally appropriate and culturally relevant.
17. School emphasises the positive, appealing aspects of healthy eating rather than the harmful effects of unhealthy eating.
18. School provides staff involved in nutrition with adequate and ongoing in service training.
19. School has collaboration between food service staff and teacher.
20. School encourages and involves family members in supporting and reinforcing nutrition education.
21. School encourages and involves the community in supporting and reinforcing nutrition education.
22. School encourages and involves family members in supporting and reinforcing healthy eating policy.
23. School encourages and involves the community in supporting and reinforcing healthy eating policy.
24. School coordinates food service with nutrition education and other components of school health programme.
25. School regularly evaluates the effectiveness of its programmes and curricula

Table 11 - Description of the changing policy implementation during 1 year research in the intervention schools

Schools	**Negative changes**	Positive changes
School 1(Baan-Rong-Fong)	• **School has established a plan of health promotion activities for students and staff.** • **School encourages and involves family members in supporting and reinforcing nutrition education** • **School encourages and involves the community in supporting and reinforcing nutrition education**	• School has written school healthy eating policies. • School has guideline for healthy eating in preschool children • School communicates healthy eating policies to all stakeholders • School emphasises the positive, appealing aspects of healthy eating rather than the harmful effects of unhealthy eating. • School coordinates food service with nutrition education and other components of school health programme
School 2 (Baan-Pun-chueng)	• **School has guideline for healthy eating in preschool children** • **School provides and promotes healthy eating choices through the services of school canteen or tuck shop** • **School has established a plan of health promotion activities for students and staff.**	• School offers healthy snack. • School provides nutrition education activities that are fun, participatory, developmentally appropriate and culturally relevant • School emphasises the positive, appealing aspects of healthy eating rather than the harmful effects of unhealthy eating. • School provides staff involved in nutrition with adequate and ongoing in service training • School encourages and involves family members in supporting and reinforcing nutrition education • School encourages and involves the community in supporting and reinforcing nutrition education • School coordinates food service with nutrition education and other components of school health programme

Schools	Negative changes	Positive changes
School 3 (Baan-Nam-Cham)	• **School has established a plan of health promotion activities for students and staff.** • **School provides nutrition education activities that are fun, participatory, developmentally appropriate and culturally relevant**	• School has written school healthy eating policies. • School offers healthy drink. • School communicates healthy eating policies to all stakeholders • School emphasises the positive, appealing aspects of healthy eating rather than the harmful effects of unhealthy eating. • School coordinates food service with nutrition education and other components of school health programme
School 4 (Baan-Nai-Wiang)	• **School provides and promotes healthy eating choices through the services of school canteen or tuck shop** • **All teachers schedule time for students to wash their hands before meals and snacks** • **School provides nutrition education activities that are fun, participatory, developmentally appropriate and culturally relevant**	• School has written school healthy eating policies. • School offers healthy food and discourages food added sugar • School offers healthy snack. • School has guideline for healthy eating in preschool children • School cooks have guideline for healthy eating in preschool children • School emphasises the positive, appealing aspects of healthy eating rather than the harmful effects of unhealthy eating. • School encourages and involves family members in supporting and reinforcing nutrition education • School encourages and involves the community in supporting and reinforcing nutrition education

Schools	Negative changes	Positive changes
School 5 (Baan-Supan)	• **School offers healthy snack** • **School provides staff involved in nutrition with adequate and ongoing in service training** • **School encourages and involves the community in supporting and reinforcing nutrition education**	• School has written school healthy eating policies. • School offers healthy food and discourages food added sugar • School offers healthy drink • School has collaboration between food service staff and teacher.
School 6 (Baan-Maelai)	• **School has written school healthy eating policies.**	• School offers healthy food and discourages food added sugar • School offers healthy drink • School has guideline for healthy eating in preschool children • School provides and promotes healthy eating choices through the services of school canteen or tuck shop • School emphasises the positive, appealing aspects of healthy eating rather than the harmful effects of unhealthy eating.

Schools	Negative changes	Positive changes
School 7 (Wad-Thunglom)	• **School provides and promotes healthy eating choices through the services of school canteen or tuck shop**	• School has established a plan of health promotion activities for students and staff. • School communicates healthy eating policies to all stakeholders • School emphasises the positive, appealing aspects of healthy eating rather than the harmful effects of unhealthy eating. • School encourages and involves family members in supporting and reinforcing nutrition education • School encourages and involves the community in supporting and reinforcing nutrition education • School coordinates food service with nutrition education and other components of school health programme
School 8 (Wad-Sripoom)	• **School has guideline for healthy eating in preschool children**	• School offers healthy snack • School communicates healthy eating policies to all stakeholders • School provides nutrition education activities that are fun, participatory, developmentally appropriate and culturally relevant • School emphasises the positive, appealing aspects of healthy eating rather than the harmful effects of unhealthy eating. • School encourages and involves family members in supporting and reinforcing nutrition education • School encourages and involves the community in supporting and reinforcing nutrition education

Table 12 - Description of the changing policy implementation during 1 year research in the control schools

Schools	Negative changes	Positive changes
School 9 (Baan-Tung Hong Tai)	• **School provides and promotes healthy eating choices through the services of school canteen or tuck shop**	• School has guideline for healthy eating in preschool children • School has established a plan of health promotion activities for students and staff. • School communicates healthy eating policies to all stakeholders • School provides staff involved in nutrition with adequate and ongoing in service training
School 10 (Wad-Nam Kong)	• **School provides and promotes healthy eating choices through the services of school canteen or tuck shop** • **All teachers schedule time for students to wash their hands before meals and snacks** • **School provides nutrition education activities that are fun, participatory, developmentally appropriate and culturally relevant**	• School has established a plan of health promotion activities for students and staff • School emphasises the positive, appealing aspects of healthy eating rather than the harmful effects of unhealthy eating. • School has collaboration between food service staff and teacher.

Schools	Negative changes	Positive changes
School 11 (Wad-Muang-Kha)	• **School provides nutrition education activities that are fun, participatory, developmentally appropriate and culturally relevant** • **School provides staff involved in nutrition with adequate and ongoing in service training**	• School has guideline for healthy eating in preschool children • School provides and promotes healthy eating choices through the services of school canteen or tuck shop • School communicates healthy eating policies to all stakeholders • School emphasises the positive, appealing aspects of healthy eating rather than the harmful effects of unhealthy eating.
School 12 (Huay-Mah)	• **School provides and promotes healthy eating choices through the services of school canteen or tuck shop** • **School emphasises the positive, appealing aspects of healthy eating rather than the harmful effects of unhealthy eating.**	• School has established a plan of health promotion activities for students and staff • School communicates healthy eating policies to all stakeholders • School provides staff involved in nutrition with adequate and ongoing in service training

Schools	Negative changes	Positive changes
School 13 (Baan-Pong)	• **School has written school healthy eating policies.** • **School offers healthy drink** • **School offers healthy snack** • **School has strategies for healthy eating outside school** • **School provides and promotes healthy eating choices through the services of school canteen or tuck shop** • **All teachers schedule time for students to wash their hands before meals and snacks** • **School encourages and involves family members in supporting and reinforcing nutrition education**	• School has established a plan of health promotion activities for students and staff • School emphasises the positive, appealing aspects of healthy eating rather than the harmful effects of unhealthy eating. • School has collaboration between food service staff and teacher.
School 14 (Mae-Kam)	• **School emphasises the positive, appealing aspects of healthy eating rather than the harmful effects of unhealthy eating.**	• School has written school healthy eating policies. • School has strategies for healthy eating outside school • School has established a plan of health promotion activities for students and staff • School communicates healthy eating policies to all stakeholders • School provides nutrition education activities that are fun, participatory, developmentally appropriate and culturally relevant • School encourages and involves the community in supporting and reinforcing nutrition education

Schools	Negative changes	Positive changes
School 15 (Hua-Fai)	• **School has guideline for healthy eating in preschool children** • **School has established a plan of health promotion activities for students and staff** • **School provides staff involved in nutrition with adequate and ongoing in service training** • **School has collaboration between food service staff and teacher.**	• School has written school healthy eating policies. • School provides nutrition education activities that are fun, participatory, developmentally appropriate and culturally relevant • School encourages and involves family members in supporting and reinforcing nutrition education • School encourages and involves the community in supporting and reinforcing nutrition education
School 16 (Baan-Dong)	• **School provides and promotes healthy eating choices through the services of school canteen or tuck shop** • **School has established a plan of health promotion activities for students and staff**	• School has written school healthy eating policies. • School provides nutrition education activities that are fun, participatory, developmentally appropriate and culturally relevant • School provides staff involved in nutrition with adequate and ongoing in service training • School encourages and involves family members in supporting and reinforcing nutrition education • School encourages and involves the community in supporting and reinforcing nutrition education

Table 13 Demographic characteristics of preschool children according to school groups (N=219)

Variables	Control schools (N=84)	Intervention schools (N=135)
Sex		
boy	43 (51.2%)	68 (50.4%)
girl	41 (48.8%)	67 (49.6%)
Age		
4 years	38 (45.2%)	63(46.7%)
5 years	46 (54.8%)	72(53.3%)

Table 14 - Demographic characteristics of preschool children's families according to school groups (N=219)

Variables	Control schools (N=84)	Intervention schools (N=135)
Level of education (father)		
Primary school	48 (57.1%)	73 (54.1%)
Secondary school	34 (40.5%)	60 (44.4%)
Other	2 (2.4%)	2 (1.5%)
Level of education (mother)		
Primary school	56 (66.7%)	93 (68.9%)
Secondary school	26 (31.0%)	39 (28.9%)
Other	2 (2.4%)	3 (2.2%)
Occupation (father)		
Labour	53 (63.1%)	88 (65.2%)
Farmer	15 (17.9)	29 (21.5%)
Other	16 (19.0%)	18 (13.3%)
Occupation (mother)		
Labour	55 (65.5%)	83 (61.5%)
Farmer	23 (27.4%)	35 (25.9%)
Other	6 (7.1%)	17 (12.6%)
Household size		
2-3 people	9 (10.7%)	21 (15.6%)
4 people	37 (44.1%)	57 (42.2%)
5+ people	38 (45.2%)	57 (42.2%)
Family income		
<1 Income*	82 (97.6%)	125 (92.6%)
1+ Income	2 (2.4%)	10 (7.4%)
Daily pocket money of children		
0-4 baht	17 (20.2%)	9 (6.7%)
5-9 baht	45 (53.6%)	77 (57.0%)
10-14 baht	20 (23.8%)	29 (21.5%)
15+ baht	2 (2.4%)	20 (14.8%)

*Phrae income 2004 (US $ 284) (National Statistical Office, 2005)

Table 15 - Snack groups and their components, used in the Study

Snack groups	**Components**
Cariogenic snacks	Sweets, cake and bread with sugar, confectionery, peanut with coated flavour and sugar, Thai desserts group, crispy snack with sugar, sugary drinks group.
Thai desserts	Kautommud, Khanomchan and Thai custard
Crispy snacks	Potato chips, instant noodle, crispy snack with sugar and crispy snack without sugar.
Sugary drinks	25% fruit juice, soft drinks, flavoured milk with sugar, drinking yoghurt with sugar, sugar containing drinks and ice cream.

Table 16 - Mean frequencies of daily intakes from each snack category (times per day)

	Times per day		**Times per day**	
	Control schools (N=84)		Intervention schools (N=135)	
	Baseline	***Evaluation***	***Baseline***	***Evaluation***
	x±SD	x±SD	x±SD	x±SD
Cariogenic snacks	1.03±0.73	1.39±0.86*	1.12±0.79	0.84±0.58*
Fresh fruits	0.13±0.25	0.08±0.16	0.10±0.20	0.07±0.17*
Non-sugar milk	0.98±0.11	1.0±0.16*	0.94±0.20	0.97±0.20
Thai desserts	0.11±0.25	0.06±0.18	0.23±0.40	0.13±0.20*
Crispy snacks	0.67±0.57	1.10±0.57*	0.91±0.77	0.68±0.44*
Sugary drinks	0.18±0.28	0.18±0.31	0.31±0.41	0.23±0.37*

*p<0.05

Table 17 Statistically significant differences between frequencies of preschool children's dietary intakes in control and intervention schools at baseline and at evaluation

			Intervention											
			Baseline						Evaluation					
			Cariogenic snack	Fresh fruits	Non-sugar milk	Thai desserts	Crispy snacks	Sugary drinks	Cariogenic snack	Fresh fruits	Non-sugar milk	Thai desserts	Crispy snacks	Sugary drinks
Control schools	Baseline	Cariogenic snack	0.38											
		Fresh fruits		0.38										
		Non-sugar milk			0.11									
		Thai desserts				**0.01**								
		Crispy snacks					**0.01**							
		Sugary drinks						**0.01**						
	Evaluation	Cariogenic snack							**0.00**					
		Fresh fruits								0.13				
		Non-sugar milk									0.29			
		Thai desserts										**0.01**		
		Crispy snacks											**0.00**	
		Sugary drinks												0.17

baseline *vs* baseline (2-tail)
evaluation *vs* evaluation (1-tail)