Does organic food intervention in school lead to change dietary patterns?

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Abstract

Now, more than ever, there are serious health concerns for obese and overweight children. All around us are unhealthy foods such as sweets, energy-dense convenience and fast foods. This makes it much harder to encourage children to stay in a healthy eating style. Schools are the perfect setting for children to learn, and this influence can play an important role in preventing children from becoming obese and overweight. The purpose of this research was to examine whether organic food intervention in school meals could help children establish healthy eating patterns. This was determined through the comparisons between the public organic food procurement policy based schools and non policy based schools. The study undertook surveys among school food coordinators in selected Danish and Norwegian primary schools through a web-based questionnaire. The data shows the relations regarding the school food service between different types of schools, and also based on the ways and methods of food provision. Results indicate that organic food intervention can be effective in preventing the development of obesity and overweight issues among the children in schools.

Acknowledgement

The author would like to thank Bent Egberg Mikkelsen for his guidance of the whole study, thank you to Anne-Kristin Løes, Gun M. Roos and Matthias Koesling for the revision of the web based questionnaire and gathering Norwegian school names. Thanks also to Mads Peter Klink Engelhardt and Astrid Dahl for gathering part of Danish school names, thank Sheryl Mae Garley for the revision of the paper, and my husband, Carsten Sonne Larsen for his technical help and support on the research. Finally thank you to Ramboll Management A/S for providing the questionnaire software.

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List of abbreviations

iPOPY	innovative Public Organic food Procurement for Youth
WBQ	Web based questionnaire
SPSS	Statistical Package for the Social Sciences
POP	Public Organic food Procurement
FNP	Food & Nutrition Policy
HPS	Health Promoting School
WHO	World Health Organization
CHEJ	Center for Health, Environment and Justice

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1. Introduction

The lifestyle of European are changing but not in a positive way. People are eating more fast food and ready meals than fresh fruit and vegetables. They would rather sit in front of the TV, or play with electronic devices, from computers to video game than spend more time exercising. This is just producing more and more people in the population are getting fatter and fatter. Moreover, there is an increase in obesity-related disease in many European countries such as type 2 diabetes, high blood pressure and chronic disease, etc. Obesity-related disease has already resulted in around 10-13 % deaths in Europe. The number of obese people has currently reached about 145 million, which is 16 % of the whole population in Europe. If you consider the population of overweight people also, the number increases dramatically to 445 million, or basically 50% of the European population (Isager, 2007).

Obesity and overweight rates among children and young people is also amazingly increasing throughout Europe. Data shows, that almost 22 million children are overweight in Europe today, and that will raise to probably 1.3 million more by 2010 (Mu, 2008). During adolescence, food habits, physical activity, and life-style of young people are easily influenced by a number of factors and phenomena in the environment. This includes parents, friends, advertisements and all of the changes occurring in society (Samuelson, 2000). The meal patterns formed during adolescence will be continuously influenced into their adulthood, even following generations in the future. This tendency is a real challenge for European countries. However, it can be changed if the countries take a concerted action from the top to the bottom of the society, in other words, from government to school level. Since school is an important role in the education of young people, school curricula should have a goal in mind to make sure that pupils get appropriate physical activities, and also teach them how to establish a healthy diet pattern. The school meals program is one of the strategies to promote better, healthier food and eating habits for the youth. The motivation of the school meal service is to provide healthy food through schools and to establish appropriate eating habits in pupils.

This study is concerned about organic food intervention in school meals. Organic foods are produced differently from conventional foods. They grow without synthetic pesticides or artificial fertilizers, etc. Afterwards they are processed without additives (EEC, 2007). Organic foods are a healthier choice for consumers and also more environmental friendly. The study belongs to one of eight transnational research projects in the European Core Organic program, iPOPY-innovative Public Organic food Procurement for Youth. "The project will suggest efficient policies and instruments for increased consumption of organic products in public food serving outlets for youth (iPOPY, 2007)." The iPOPY project is carried out in four European countries, Italy, Denmark, Norway and Finland. This paper will contribute to the working package 5 in the iPOPY project, Nutrition and Health.

The purpose of this research study is to explore the relationship public organic food procurement policy/praxis and food nutrition policy/praxis in relation to food service in public school settings. Public Organic food Procurement policy (POP) refers to a policy, in which a particular amount of specified foods are expected to be organic, which are practiced in public organizations offering food. Food & Nutrition Policy (FNP) is a set of written and adopted principles that aims to fulfill nutritional needs of pupils at schools, and ensure availability and accessibility of healthy foods. The 7 main objectives are: 1) to uncover the attitude of school food coordinators to promote organic food through school food service and education. 2) to uncover the attitude of school food coordinators to promote healthy eating habits through school food service and education 3) to show if schools involve a policy/approach concerning organic issues to promote health and well-being of all pupils. 4) to study if schools have other "healthy" food policies and if it's on account of POP. 5) to analyze if a serving practice in schools has been promoted with the different types of food provision. 6) to reveal if the eating habits among pupils have been changed/promoted through school serving practices that have engaged with the organic procurement policy. 7) to expose if the schools which have POP policy have been eating healthier than the schools don't have a POP policy.

This project has undertaken surveys in the public primary schools (grade 1-9) in Denmark, and the public primary and lower secondary schools (grade 1-10) in Norway, through a

web-based questionnaire (WBQ). The outcome of the questionnaire will be a mapping of serving practices in relation to healthy eating and the relation to attitudes and practices of organic food procurement and policies.

2. Theory

As the study was only carried out in Denmark and Norway, it's necessary to be aware of some knowledge about the history of school meals in 2 countries. This is also to help to fully understand the analysis of the results.

2.1 Background of organic school meals in Denmark

In the beginning of the 19' century, the school meals in Denmark were given mainly to the children from poor families. At that time it was common for poor children to get warm meals at schools. Today however, it's not usual to find a school with a canteen. There are only 20-25% of schools which have a school food service (Nielsen, Kristensen, Schmidt & Hansen, 2008). Lunch boxes from home are the most common and traditional way for children to have lunch at schools. Since there is no canteen at school or facilities where pupils can sit down and have lunch, children eat their lunch in the classroom. In most cases, parents prepare lunch boxes with a variety of cold food such as sandwiches, salads and snacks. Parents prepare the child's lunchbox but they aren't always nutritional. If parents have unhealthy eating patterns, this will have an influence on their children. And in today's modern society, busy parents have less time to prepare nutritional meals, it seems that easy and quick foods becoming an inclination day to day.

In schools there are no traditions or regulations to offer meals to pupils. It can be inferred from this that the government or national authorities haven't made up any policies concerning the public school food service yet. But who should take responsibility for the diet and nutritional intake of children? In the last 30 years, there has been an increase of 3 times the number of overweight and obese children and young people in Denmark (Mikkelsen & Trolle, 2004). Moreover, they are at risk for nutrition-related diseases during their childhood, youth and as adults. It's time for the government to adopt and monitor effective policies and strategies in order to build healthy eating pattern among

children. Obviously school meals play a crucial role in implementation of policies, and helping children to shape healthy eating habits.

Even though the school meals aren't prevalent in the country now, several municipalities have established their own local policies to offer warm/hot lunches at school. Some of the municipalities decided to adopt POP policy, so there is certain amount of organic ingredients involved in the school meals. For example, in the municipality of Roskilde, the school meals program started in 2002, and organic food was involved from the beginning. Currently 10 out of 19 primary schools have hot lunch meals with organic ingredients, which have already achieved 92% of the school food. In the municipality of Copenhagen, the organic ingredients are around 50% today, but the goal is to reach 75% of all school food.

There are 2 main ways the municipalities organize their school meals. 1) Off site. The school meals are prepare by a local private catering company or a public central kitchen. Every school day before lunch time, the food is delivered to the schools. Usually there is a small tuck shop, café or canteen where pupils can buy their meals. 2) On site. The schools have established their own kitchen and hire a "dinner lady". They cook almost all the food and are responsible for everything in the kitchen. In the municipality of Gladsaxe, 14 of 16 schools have their own kitchens. The municipality made and distributed a handbook (as a FNP) to the "dinner ladies" to guide them how to buy and cook healthy food for the pupils. Some schools in Gladsaxe and Copenhagen also involve children in the preparation or cooking of the meals. It's also possible to order meals through homepage of schools on the internet.

In the municipalities mentioned above, only 25% of children eat school meals daily. This is not a positive number compared with the amount of work put in by the municipality, kitchen and schools. The traditional of lunch boxes and the fact that meals aren't free of charge are among some of the main reasons. The organic ingredients involved make it more expensive. So far the government hasn't given any extra budget to the school meal service. There is also no definite national guideline for the percentage of organic food in

school meals. So in regard to the public organic procurement policy, it could be extended but only through the wishes of the society in general.

2.2 Background of organic school meals in Norway

As in Denmark, the initial purpose of school meals in Norway was to provide meals to poor children in school. The sponsor was a benevolent organization called "Suppekjøkken" (super kitchen) in 1880. 15 years later, the municipality started to offer free warm school meals to poor pupils. Richer children could also buy meals at a lower price. But some people in society weren't satisfied with the school meals, thinking it was poor health food that was given to children, instead of some healthy cold meals. From 1935, the schools in Norway gradually changed to offer cold meals such as fruit, vegetables, milk, cheese and bread. Unfortunately, the municipalities were no longer able to offer free meals due to the poor budget, so children had to bring food with them from home. After many years of development, this has been transformed to the lunch box which is popular today in Norwegian schools (Løes, Koesling, Roos, Birkeland, & Solemdal, 2008).

Norwegian children tend to have less physical activities and more sedentary behaviors along with their age. Children aged between 11 and 16 spend less than 8 hours weekly on outdoors activities, compared to around 40 hours per week indoors playing computer, and watching TV, etc. Moreover, the amount of sweets and soda that the children eat is rapidly increasing, but fresh fruit and vegetables are gradually decreasing (Aadland, Rimestad, Haug, & Samdal, 2007). In Norway there is no law in education concerning school meals. The current option for Norwegian children to have lunch is to bring their lunch box, for instance open-faced sandwiches. Milk and fruit are offered by schools but paid by the parents. Some schools have canteens where the pupils can sit down and have lunch, or some schools sell food to the pupils in the canteen, but they are quite few (Løes, Koesling, Roos, Birkeland, & Solemdal, 2008).

So there are no warm meals offered to student to purchase in schools, except milk and fruit. A Norwegian dairy company, TINE, has given milk out to almost all schools in the country since 1970. TINE delivers milk to the schools every week and keeps it fresh in a

refrigerator at school. The pupils can get it during school day. TINE also produces organic school milk, but it's not as available as conventional milk in schools. It's mostly sold in southern regions. The type of milk varies according to the fat content in it. The fat content in the organic school milk is 1.5%. The school fruit scheme started a little late than the school milk program. In 2004, school fruit was mentioned by public regulations, regarding the size or quality of the fruit and vegetables. But there were only 41% schools that take part in the fruit scheme, and 12% of pupils subscribed in 2006. In order to inspire more schools to join it, public funds decided to pay partially for fruit, and offer a free refrigerator to the schools, which have over 50 pupils. The fruit offered in schools are apples, pears, bananas and oranges, etc. These fruit are delivered by a wholesaler of fruit and vegetables. In some Norwegian schools they demand organic fruit (Løes, Koesling, Roos, Birkeland, & Solemdal, 2008).

The Norwegian National Nutrition Council as a school meals promoter decided a national guideline for school meals, in order to promote health among the youth. In this guideline it states what schools should and shouldn't offer to the pupils. It also gives a concept of what school meals should be, although warm/hot meals aren't specifically mentioned. There might be several reasons why the school meals aren't regulated in Norway. 1) School stakeholders prefer to use funds for other purposes such as school buildings rather than schools meals. Some municipalities in Denmark also think school lunches should be the parents' responsibility. 2) Since there is no legislation in the country to take action in school meals, local municipalities lack initiative. 3) There aren't any catering companies or public central kitchen to deliver warm school meals. 4) Lack of experience with school meals (Løes, Koesling, Roos, Birkeland, & Solemdal, 2008).

3. Methods

A quantitative survey using a Web based questionnaire (WBQ) was performed in Denmark and Norway among school food coordinators. WBQ is a form on the internet containing a set of questions, especially addressed to a statistically significant number of subjects as a way of gathering information for a survey. These surveys through the internet or by e-mail are considered very efficient and cheap. Data collection is also easier

to analyze than a paper questionnaire. A paper questionnaire via post is relatively time consuming and has a low response rate (Neuman, 2007).

The initial questionnaire was designed in a Word format and the language was in English (see Appendix A). After the first revision, the questionnaire was translated into Danish in order to carry out the questionnaire in Denmark and Norway. As Danish and Norwegian are close languages, the questionnaire and the invitation letter to participants was only in Danish. The test was carried out in 2 schools in Denmark, one organic school (the schools which have the certain amount of organic food provision) and the other a non POP school (the schools which only have conventional food provision). The Word format questionnaire was sent by e-mails to the schools' headmaster with an introduction of the project. In Norway, the partners of the iPOPY project have commented on the questionnaire based on the current status of Norwegian schools. After gathered all the comments from the test, the questionnaire was modified for the second and last time. The completed questionnaire was then converted into a web based by using the software SurveyXact (http://www.surveyxact.com), which was offered free by Rambøll Management, a management consulting company in Denmark. The final WBQ was opened in a web browser through a link.

Both the organic schools and non organic schools in these 2 countries were invited to answer the WBQ. The potential participants weren't only school food coordinators but could also be the school headmaster or school food caterer, etc (see Table 3.1). Data are from the survey of school food coordinators who are in public primary schools in 2008, in grades 1-9 in Denmark and 1-10 in Norway.

In Denmark, the names of the organic schools were collected through the help of school meal official in the municipality of Copenhagen and Roskilde. They have offered the list of school names by e-mail. The non organic schools were collected from the National Food Institution, and also a small number of the organic schools. These schools names have already been collected because they took part in previous research by the institution. The approach to develop the final e-mails list of the schools was to search for them from the Danish Education Ministry homepage (http://www.uvm.dk/). There is a search engine

for all contact information of schools in Denmark. In Norway, collecting the school e-mails list was classified according to the schools with organic/non organic fruit and organic/non organic milk provision. The organic/non organic fruit school names were obtained by the Norwegian colleague in the iPOPY project. The names of organic/non organic milk schools were provide by TINE. The development of the schools' e-mail list was by searching through the homepage of the Norwegian Education Ministry (http://skoleporten.utdanningsdirektoratet.no). Finally, a total number of 408 organic schools and 486 non organic schools from 2 countries were selected and expected to complete the questionnaire (see Table 3.2). The link of the WBQ and the invitation letter (see Appendix C) to the participants were sent to the joint iPOPY developed e-mail list. The software of SurveyXact has the function to send out the WBQ to the participants individually.

Table 3.1 the possible participants for answering the WBQ

Informants	Responsibility
School headmaster	The principal of the school.
School coordinator	The coordinator between the municipality and the school environment, and also determine entities to operate the school meal system.
School kitchen operators	The person who is responsible for preparing school food and carry out serving practices, etc.
School food caterer	The person to ensure the quality and variety of school meals, and cooperate with food suppliers or catering company.
Teachers	They involved as school kitchen operators.

Table 3.2 the number of selected schools in Denmark and Norway

Countries	Number of schools
Denmark	93 schools with organic food provision 86 schools with only conventional food provision
Norway	210 schools with organic fruit provision 200 schools with conventional fruit provision 105 schools with organic milk provision 200 schools with conventional milk provision

In order to get high reliable data, there were some ways that have been utilized to increase the reliability of the questionnaire. 1) A distinct construction of the WBQ. This means to give the clear theoretical explanation in the different sections. The questions should avoid interfering information, in other words, each question should only stick to one concept, for example, if you have a question about sugar intake *"Do you eat candy?"* The interfering information in this question is if sugar free candy should also consider as candy here. So if the question asks *"Do you eat candy (except sugar free candy)?"* it's clearer. 2) Give the most precise to measure the question. If the choice offers a more precise level, a more precise result will be captured. For example, there is one question in the WBQ which asks if the participants agree with the opinion, *"I think that organic food should play an important part of the food supply at school."*, and the choices are *"Agree very much, Partly agree, Disagree, Don't know."* So in this question there are 4 levels, this is much better than just offering *"Agree and Disagree"*. 3) Use various pieces as indicators. The results will be more reliable and stable by the use of different indicators in the questions. For instance, a question about *"Please specify in which direction your serving practices have changed in relation to availability of following items over the past 5 years.*". There are a total of 13 food items (e.g., fresh fruit, cereal, and meat, etc.) as indicators. The more indicators you have, the stronger defense you can use in the report. 4) Have a pre-test. Reliability and the quality of the WBQ can be enhanced by using a pretest such as the test in Denmark and Norway has mentioned above (Neuman, 2007).

The WBQ had been opened for three weeks and 3 ways have been used to increase the WBQ response. 1) Address the e-mail to a specific person at the school if you know his/her name. 2) Prepare two reminder letters for the schools which haven't answered the WBQ. Send the first (see Appendixes D) by e-mail one week after sending WBQ, and the second first (see Appendixes E) a week later. The link to the WBQ should be addressed again in the e-mail. 3) Contain a small lotto inducement, i.e. a trip to visit an organic school in Italy (Neuman, 2007).

The content sequence of the WBQ is mainly followed as background information, attitude of respondents, existing policies and serving practices (see Appendix B).

Background information

- Personal
- School

Attitude of respondents

- Organic food- school food/education
- Healthy eating habits- school food/education

Existing policies

- Public organic procurement policy
- Food and nutrition policy
- Health promoting school
- Green flag school

Serving practice

- School fruit scheme
- School milk scheme
- School tuck shop
- School canteen
- Food items

As you will see in the following sections, the analysis of the WBQ results were completed by using Microsoft Excel 2007 (see Appendix F), and SPSS were used for exploring and analyzing data, "a comprehensive computer system for analyzing data, provides statistical analysis and data management systems in a graphical environment (SPSS, 1999).". In the paper, present tense will be used for describing the knowledge, and past tense should be used for the analysis of WBQ results referring to the data (Chang, 2006). However, only around 26% of the schools took part in the research, thus a majority of schools didn't respond to the WBQ. There are several possible reasons for this drop out rate, 1) some of the school respondents replied that they weren't willing to participate in the research, 2) some of the school respondents answered that they were too busy to fill out the questionnaire, 3) some of the schools didn't have a food coordinator or someone responsible for answering the questionnaire, 4) for a certain amount of schools, their e-mail address no longer existed.

4. Results

In this section, the gathered data of the WBQ is presented and the results are analyzed respectively based on parts of the attitude of school food coordinators, existing policies, and serving practices. In the attitude section, questions are related, thus the analysis is relating to each other. Parts of the existing policies and serving practices sections comprise of several concepts. In these two parts the information is analyzed based on an individual concept (e.g., POP, FNP). Additionally, each concept has its own questions, which are actually main analysis objectives. Data shows, there were 167 out of 894 schools that completed the WBQ, 79 Danish respondents and 88 Norwegian respondents. Besides that, 68 schools only partially completed it.

4.1 The attitude of school respondents

Schools aren't always the decision maker regarding school meals. For instance, in Denmark the schools in the region of Copenhagen municipality don't decide if they have school meals or choose what they can offer for the school meals. This is a decision made by the municipality. There are 50% organic ingredients in the school meals in Copenhagen and this is also decided by the municipality. Since City Hall has taken the main decision in the school food service, the schools are less responsible for the meals; besides, it's not a priority for the school. Additionally, there is no motivation for the schools to promote the school meals among the children, even though there is one in the municipality level. Currently only around 20% of organic school meals are sold daily at the schools in Copenhagen County, this is not a positive number, especially when 20% of food mostly includes yoghurt, bread etc.

The school is not only a participant to carry out the school meals, but also a crucial promoter to help the pupils establish good dietary patterns. The schools' standpoints regarding the school food service are also important. This affects if the school meals are effectively carried out in order to reach their objectives (e.g., if more organic food is consumed.). If the schools don't feel like they have a duty to the school meals, just working on it because it's a policy, it never works out. In the WBQ/research, a short section undertook to ask about the attitude of school respondents concerning being

responsible for the healthy eating pattern of the pupils. It mainly focused on their opinion with regard to the relationship between the organic food, healthy eating pattern and school actions (see Figure 4.1.1). Organic food is considered healthy food and environment friendly. It might be a good idea to promote it through the school environment. One of the research purposes was to find out if organic food can help to build healthy eating practice in children through school food service and education. If schools have both organic meals and nutritional education, the learned knowledge can be actualized immediately. Theory and practice are always good partners. The same goes with promoting healthy eating habits among the children at schools.

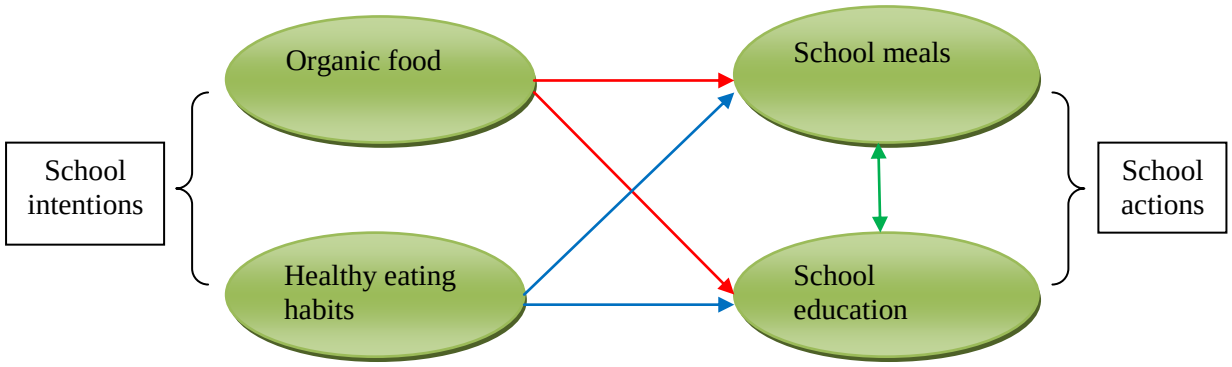

Figure 4.1.1 the relationship between organic food, healthy eating habit and school actions.

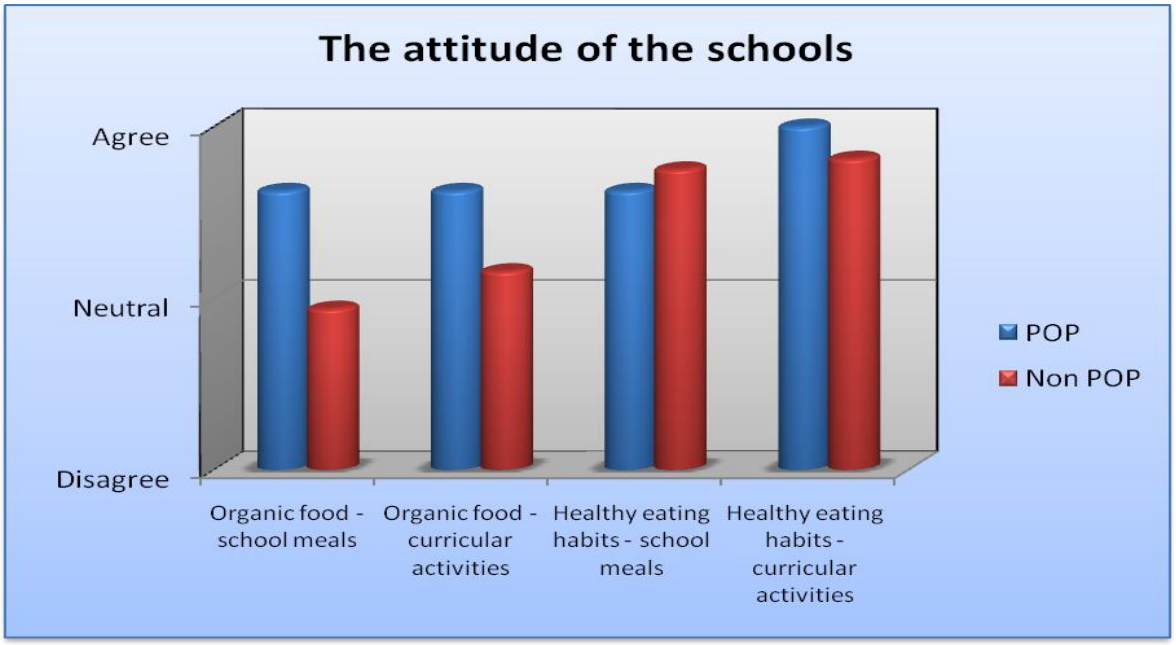

Figure 4.1.2 the attitude of the POP/non POP schools, in relation to if the respondent indicate having responsibility to promote organic food and healthy eating habits, through school food service and curricular activities.

In order to draw a clear figure, the schools were categorized based on whether they have a POP policy or not. The schools which have a POP policy are named POP schools. On the contrary, the schools which don't have a POP policy are named non POP schools. As figure (see Figure 4.1.2) shows both the attitude of respondents from POP schools and non POP schools have a positive attitude towards the four questions, regarding the responsibilities of the schools. The attitude of respondents from POP schools have more positive attitude on the aspect of promoting organic foods through school meals and education than the food coordinators from non POP schools. However, for the issue of promoting healthy eating habits through school food service, the respondents from conventional schools have more positive attitude than the POP schools, but the POP school respondents agree stronger than the non POP schools about to promote healthy eating habits through school education. Therefore, most of cases the respondents from organic schools partially agree (between agree and neutral) stronger than non POP schools. It seems that the POP school respondents in both countries agree strongly with the point that the schools are willing to build a healthy eating habit through the school education. So do the non POP schools. As anticipated, the non POP schools aren't as actively concerned as the POP schools with the organic issues. The analysis of the attitudes of school food coordinators was based on the average value of answers (see Appendix G).

4.2 Existing policies

4.2.1 Public Organic food Procurement (POP)

Table 4.2.1.1 the percentage of the POP/non POP schools in Denmark and Norway

	Denmark	Norway	Total
POP	23,3%	20,9%	22,0%
Non POP	73,3%	73,6%	73,4%
Don't know	3,5%	5,5%	4,5%
Total	86	91	177

According to the school respondents there were 20 Danish schools and 19 Norwegian schools which have POP policies relating to the school food (see Table 4.2.1.1). Most of the other schools answered that they don't have a POP policy in the school environment,

and a small number of the respondents didn't know whether the school has the POP policy or not. Between the both countries the numbers were fairly equal, so this is a good condition to analyze and compare cases. The results will be rather objective.

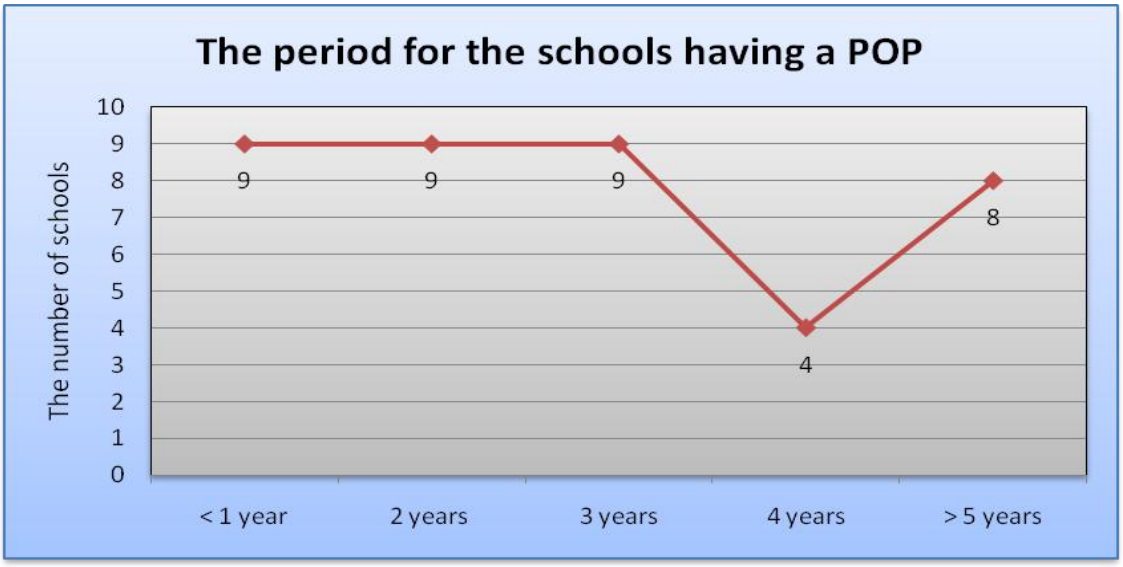

Figure 4.2.1.1 the tendency of having a POP policy in the schools over the last 5 years

Even though the organic food is poorly involved in the school meals history, organic produce has been developed for a long time in both countries. Denmark has taken the first action in the world to introduce legislation for organic agriculture in 1987 (DVFA, 2006). Along with the development of organic food, today organic products are a widespread trade in Denmark. Back in 1931, Norwegian farmer had already planted organic produce. From 1989 to 1999 organic soil in the country was increased 8 times more than before (Sogn, 2004).

This research was also interesting in regard to how much time the POP schools have had the organic policy. In other words, organic food whether has already caught some attentions by the schools from a long time ago. The chart shows (see Figure 4.2.1.1) back in 2003 there were eight schools that already had the POP policy, and the next year it increased by four schools more. From 2005 to 2008 the number of schools has expanded steadily with nine schools joining in each year. The first eight POP schools might have the policy even longer. Obviously, the numbers has increased five times over the five

years, so the schools have a tendency to pay more and more attention on the organic school foods in Denmark and Norway.

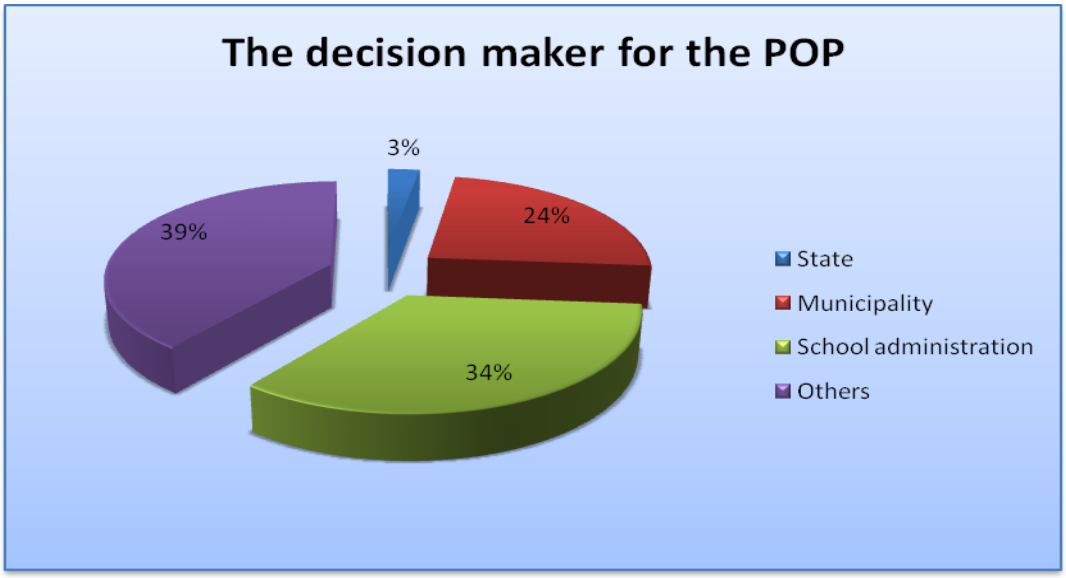

Figure 4.2.1.2 the different key actors during the adoption of the POP policy

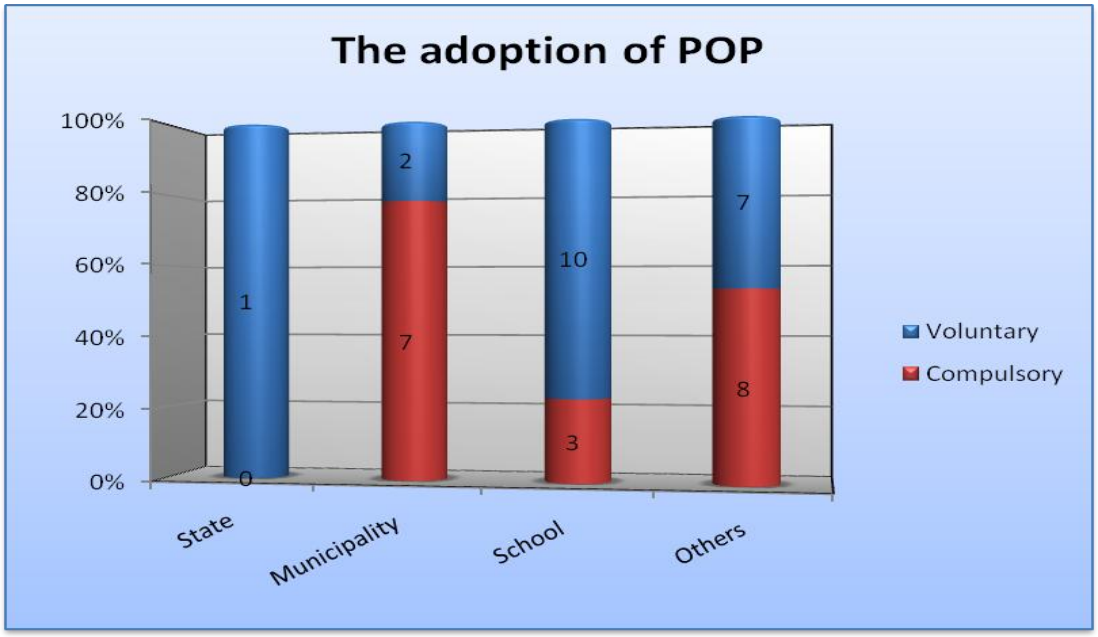

Figure 4.2.1.3 the modes of choosing on the POP policy

As mentioned in the previous section, attitudes of schools are also very important to promote organic school meals. In the same category, in the WBQ there was a question to ask about who has the main responsibility to adopt the POP policy in the schools. The

initial idea is made by the schools or the top-bottom implementation. It reveals that POP is a mandatory or voluntary policy. The possible stakeholders are from government, municipality, school itself, and the others.

The pie chart (see Figure 4.2.1.2) indicates the greatest decision maker for the POP in the schools were "Others". 15 out of 38 POP school respondents have chosen this option. However, data shows 10 of these 15 respondents who actually wrote the answers were either school leaders, school employees or school teachers, etc. In this study all of them is considered in the school enviroment. So the decision maker for the schools to have a POP policy was mostly decided by school itself. The responses vary. Some schools adopted POP policy were suggested by the pupils' parents, the fiery local requirement, and the kitchen manager or catering company. 9 schools adopted the POP policy because of the municipality's decision. The city council adoptes it and then the schools are responsible for the implementation of the policy. In addition only one school adopted the POP as a state decision, and it was voluntary. From the bars on the graph (see Figure 4.2.1.3), you can see that the policy adopted by the municipalities were mainly compulsory. On the other hand the schools generally acted on its own free will. As 2/3 of the "Others" were mostly distributed to the school level, the bar of "Others" shows the rate between the two modes were almost equal, so on the average, the schools are willing to become involved with the POP policy by themselves.

Now in Denmark people can buy organic products in supermarkets, stores and farm outlets, etc. The most common and affordable organic foods are dairy products, potatoes, carrots, eggs and cereals. Moreover, the danish consumers demand more organic vegetables and fruit in the supermarket (DVFA, 2006). In Norway there is only around 2% organic food on the market but development is fast. More and more Norwegian supermarket owners would like to promote organic foodstuff to the consumers. In order to increase the consumption of organic shares, organic food should be placed where it gets attention and interest from people who are shopping (Sogn, 2004).

The need for organic produce is raised, corresponding with the movement on the inspection of organic is also essential. Strict inspection gives consumers high credibility

on organic food. It also develops the organic share of the market. The same principle goes with the organic food in the school meals. It's necessary to establish some rules to guarantee the quality of school meals. For example if the organic ingredients in school meals reach the demand percentage, organic food purchased from the certified organic farmers, if kitchen staff have been trained to offer organic food, etc.

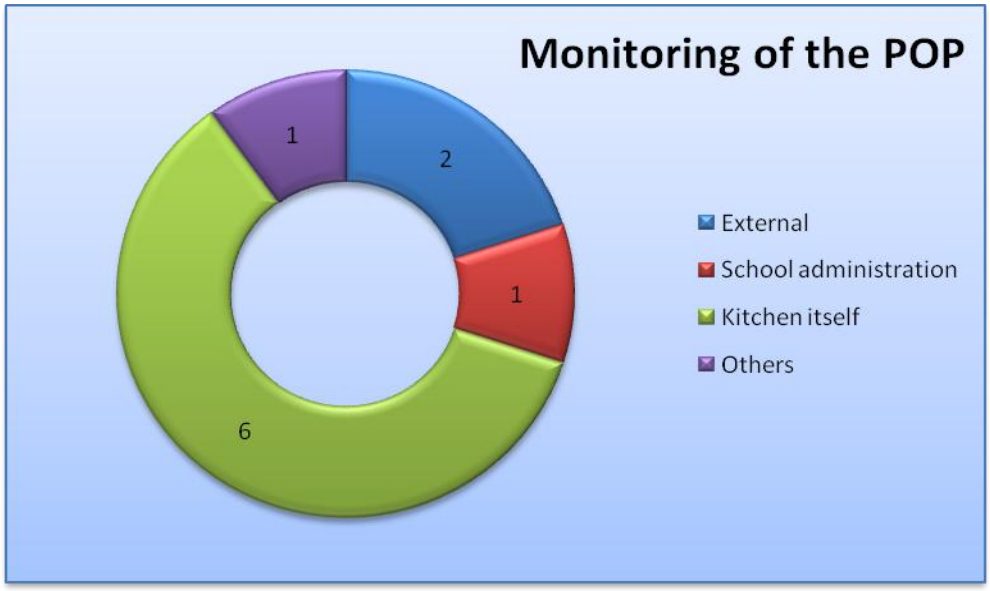

Figure 4.2.1.4 the ways of evaluation/monitoring the POP policy in the school meals

However, only 10 POP schools in the research findings have composed monitoring steps or evaluation parameters in relation to their organic school food (see Figure 4.2.1.4). Two schools responded that meals are inspected by an external official, from the municipality, and one is from school administration, which is an internal inspector. There was one school in the result which gets advice from a nutritionist. Most schools have their own internal monitoring kitchen control, but this kitchen isn't only on the school site but also a catering company. Even though the other POP schools haven't made any rules yet, they more or less followed up the application of organic food according to the POP policy. Most of these schools are based on informal inspection from internal inspectors or just internal kitchen monitoring. Schools in the region of Roskilde municipality in Denmark get school meals from a local private catering company. The catering company buys the organic food from organic farmers, but they don't need to give certification, just by verbal

agreement. The municipality and the catering company are working together on the organic menu, but there are no monitoring procedures overlooking it.

4.2.2 Food and Nutrition Policy (FNP)

The WBQ also conducted food and nutrition policy surveys in the schools. FNP is one of policies to improve the health of children through school circumstance. The content of policy is various according to different schools. It's not only about how to prepare healthy school foods but also how to get pupils involved in the activity. There were 52 Danish schools and 41 Norwegian schools in the survey have a FNP (see Table 4.2.2.1). The number of FNP schools (the schools have a FNP for pupils) was 23% more than the number of non FNP schools (the schools don't have a FNP for pupils) in Denmark. But the two types of schools were almost equivalent in numbers in Norway. Few of the respondents failed to give the information on whether the school has a FNP policy.

Table 4.2.2.1 the percentage of the FNP/non FNP schools in Denmark and Norway

	Denmark	Norway	Total
FNP	61,2%	45,1%	52,8%
Non FNP	37,6%	46,2%	42,0%
Don't know	1,2%	8,8%	5,1%
Total	85	91	176

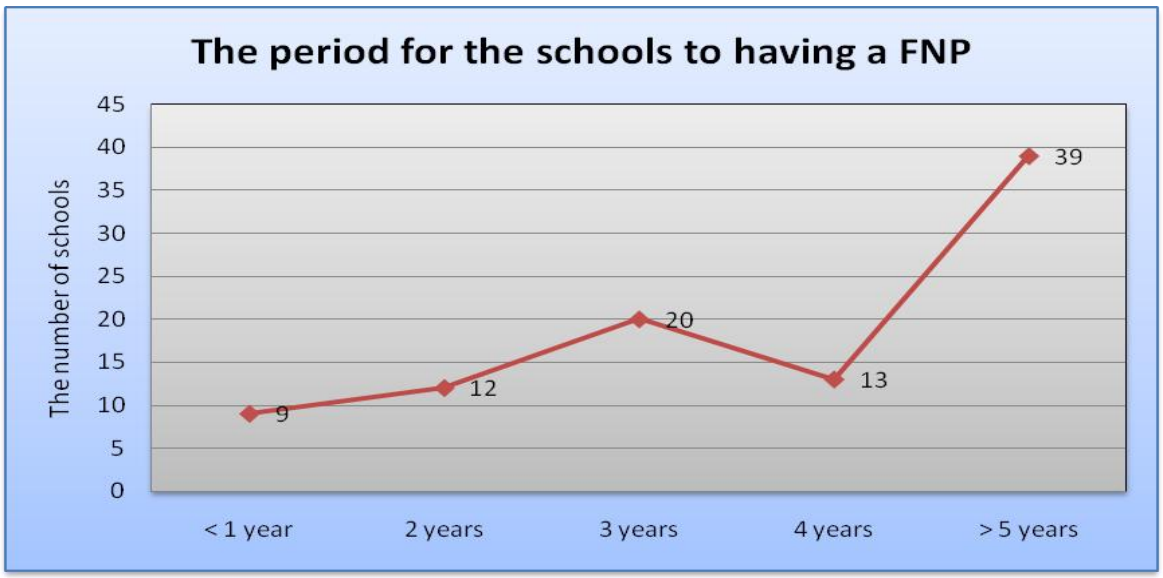

Figure 4.2.2.1 the tendency of having a FNP in the schools over the last 5 years

The line points out (see Figure 4.2.2.1) the tendency of having a FNP in schools wasn't stable over the last five years. At the beginning, in 2003, there were already 39 FNP schools, and they probably adopted the policy before 2003. Between 2003 and 2008 saw an increase of 54 schools with a FNP, so on the average each year added 13 schools. The chart shows that 2005 got the most number of FNP schools. Last year only 9 schools started to have a FNP from the two countries. In total, the number of FNP schools has more than doubled over the last five years.

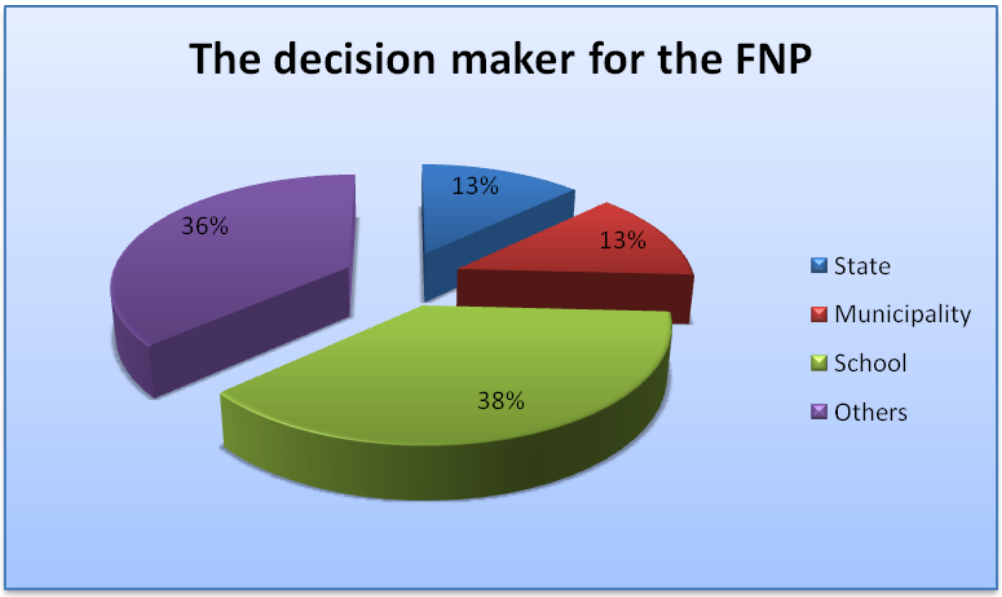

Figure 4.2.2.2 the different key actors during the adoption of the FNP

As shown in the chart (see Figure 4.2.2.2), the adoption of the FNP from the state and municipality was equal in numbers. Therefore, 24 of 93 schools adopted the FNP from top level through to school level. However, most of decision making was by the schools. There were 38% respondents that have chosen "School administration" in the WBQ, but 36% of schools have answered "Others". So it's worth finding out what these "Others" mean in the result. Data indicates that an overall 32 school respondents have responded to "Others". 13 of them replied that the FNP was decided by the school board, an organized body of administrators or investigators. Unfortunately the respondents didn't give any information about who the members were on the school aboard. It could consist of pupils, parents, teachers, school headmaster or an official from municipality, etc. So the school board doesn't completely belong to the school, it comprises of some external factors. The

others are a diversity of answers. For instance, the FNP was also driven by teachers, school employees, school leaders and working together with another school. These participants are all part of the school level, so the percentage of decision makers from school level occupied most. Very few respondents told that this is a desire from local society.

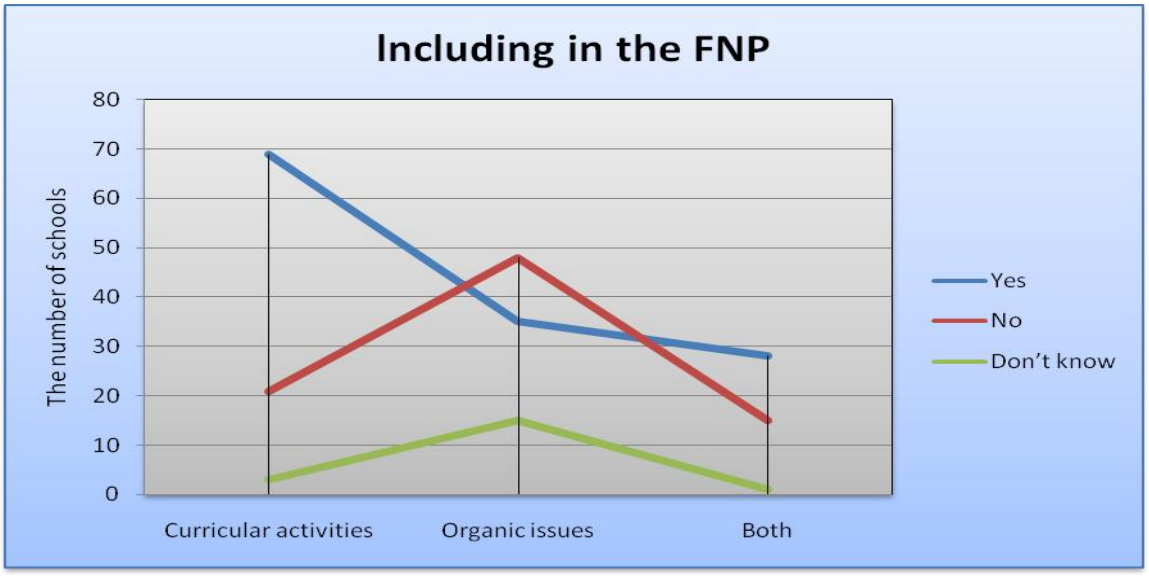

Figure 4.2.2.3 the numbers of schools have/don't have either teaching activities or organic issues or both of them involved in the FNP.

The content of FNP is different from country to country, from school to school. The policy can include various aspects of school meals. In the WBQ, two aspects considered most interesting for the research have been asked of the respondents. One was regarding teaching activity and the other was organic issues.

The FNP in the municipality of Gladsaxe in Denmark is a good example for explaining curricular activities involved in the policy. The municipality hasn't established a POP policy, but a FNP to the schools. This FNP contains different chapters, seasons of the foods, recipes, and nutritional menus, etc. The kitchen staff at the school canteen needs to buy or cook food according to the recipes in the FNP. They even design the menu according to the guideline. Danish schools usually have cookery lessons which are called home economics. Differently, the schools in Gladsaxe promote this lesson more or less as a nutritional education. The teachers still teach cooking but they are more focused on

teaching health. The pupils between 3rd and 8th in the school (Værebro Skole in Gladsaxe) cook food in the kitchen for other pupils. The pupils in one class are divided into three groups, so each class gets three weeks of cooking duties yearly. The teachers educate the pupils on how to cook the meals and also about hygiene. This is an efficient way to engage the pupils and the teachers in the school meals through educational activities. So far the organic issues haven't been mentioned in the policy.

During the curricular hours, the schools can also teach children how to pack a healthy lunch box accord to the FNP, especially if they don't have a canteen in the school. The curricular activities, or nutritional education, have the function of guiding the promotion of health of children. Organic issues involved in the education/policy are also necessary. There were 69 of 93 FNP schools which have curricular activities included in the FNP, so 74% FNP schools answered that they have a form of nutritional education for the pupils (see Figure 4.2.2.3). Around 35 schools have organic issues covered by the FNP, so most of FNP schools don't contain it in the policy. It can be concluded that most of the FNP schools have more nutritional education activity than organic issues involved in the policy. The number of schools which have both aspects involved in the policy was only 28; while on the contrary, 15 FNP schools have neither of them.

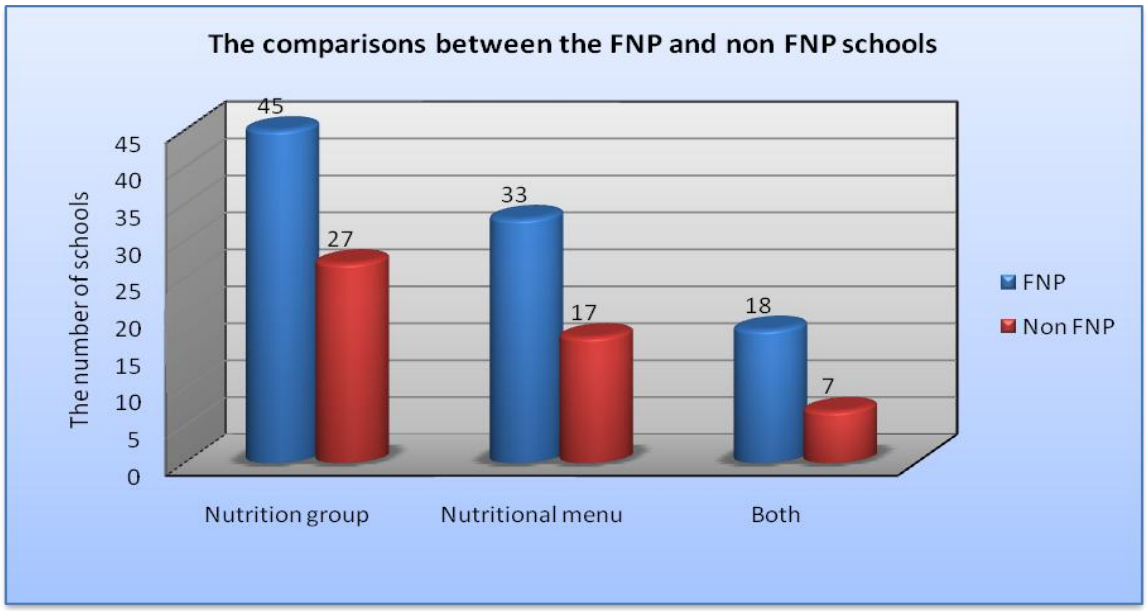

Figure 4.2.2.4 the comparisons between the FNP/non FNP schools regarding the schools having a nutrition committee or nutritionally calculated menu or having both of them.

If the school has a FNP, it may also have a canteen or a nutrition group. The definition of a school nutrition group could be diverse. In the WBQ the school nutrition group refers to a group of people from school or an external company to provide the best quality of school food and food service facilities for pupils. The nutrition group should be in charge of providing school meals which are well-balanced and nutritionally calculated on a regular basis. The nutrition group shouldn't only deal with the food and create healthy menus, but also serve the eating facilities in schools in order to build a comfortable eating atmosphere for pupils, such as a canteen, vending machines, water access, etc.

The figure shows (see Figure 4.2.2.4), there were 45 out of 93 FNP schools which almost half of the amount, has a nutrition group/canteen group or similar and 33 FNP schools have menus based on the nutritional calculation. 18 of them have both a nutrition group and healthy menu for school meals. From this data it can be seen that some schools still answered two questions even though they don't have a FNP. In total, 74 non FNP schools joined the survey, 27 of them have a nutrition/canteen group in the schools, and 17 non FNP schools have a nutritional menu. Only several non FNP schools have both. So it turns out that the FNP schools take more action and force than non FNP schools, in regard to the healthy school foods for pupils.

4.2.3 Health Promoting School (HPS)

In this section, the policies relation to general school health issues is illustrated. The study concerns the behaviours of health promoting schools according to a broad definition of HPS in World Health Organization (WHO), or dependent on their own health promoting policies. "A health promoting school is one that constantly strengthens its capacity as a healthy setting for living, learning and working (WHO, 2007)." So the schools can estimate if they are assigned as a HPS according to WHO principles. Otherwise, the school can also make their own health promoting policies.

A HPS is not only about pupils eating healthy and doing exercises. HPS also promotes physical activity, behaviors in society and spirituality of pupils and school staff. The schools endeavor to create a healthy environment for pupils, provide health education, and work together with the municipality, parents, teachers, unions, pupils and so on to

build a healthy school. Therefore, a HPS promotes and protects the health of pupils within the school and the involvement of the wider community. In a health promoting school, pupils can learn to make healthy choices by themselves. During the school day, healthy food and drinks are offered and they can play in an attractive playground. It's very important that everyone is treated fairly and pupils feel happy in school (WHO, 2007).

The purpose of a school health promoting policy is to strengthen and support the work. The policy should concern the whole appearance of school life. Due to different districts, priorities, problems and surroundings, different schools have a different focus to the policy. One school may think healthy school meals are more important, but another may consider physical activity should take precedence. So a school health promoting policy needs to be made locally from others to others. The policy should be reviewed, checked and developed regularly by school staff and parents. A health promoting school should get everyone involved in decision making including pupils, and listening to the pupils' opinion (Gray, Young & Barnekow, 2006).

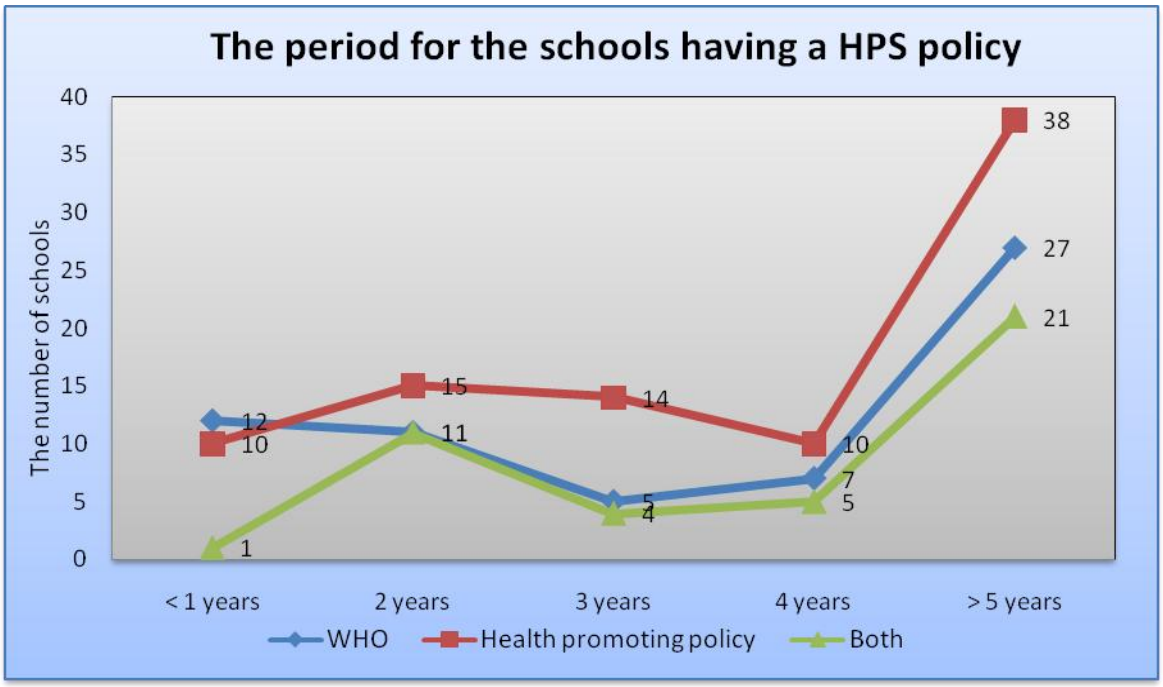

Figure 4.2.3.1 the period for the schools having a HPS policy, the types of schools are health schools based on WHO principle or on the schools own health policy or both.

In the WBQ, 62 schools believed that they are a HPS according to WHO principles, 26 were Danish schools and 36 were Norwegian schools. So here these schools were considered as having a WHO policy. On the other hand, 87 schools, 44 from Denmark and 43 from Norway, have made their own health promoting policy. 42 schools have both policies. These two kinds of policies were belonging to HPS policy in the research. The chart displays the time of having a HPS policy in schools (see Figure 4.2.3.1). Back in 2003, more schools had their own health promoting policies than a WHO policy, with the number of schools having both policies a bit lower. The same status like this has almost lasted for five years. In 2005, only 5 schools became WHO policy schools, and the other years it increased by around 10 schools. From 2003 to 2008 the number of schools that have their own health policies increased about 12 on the average each year. The schools that have both policies increased at a slow rate, except in 2006 when 11 schools became a member. In the last year only one school from Denmark has adopted both policies. This is an interesting phenomenon. In 2006, all schools had the most increment over the last five years.

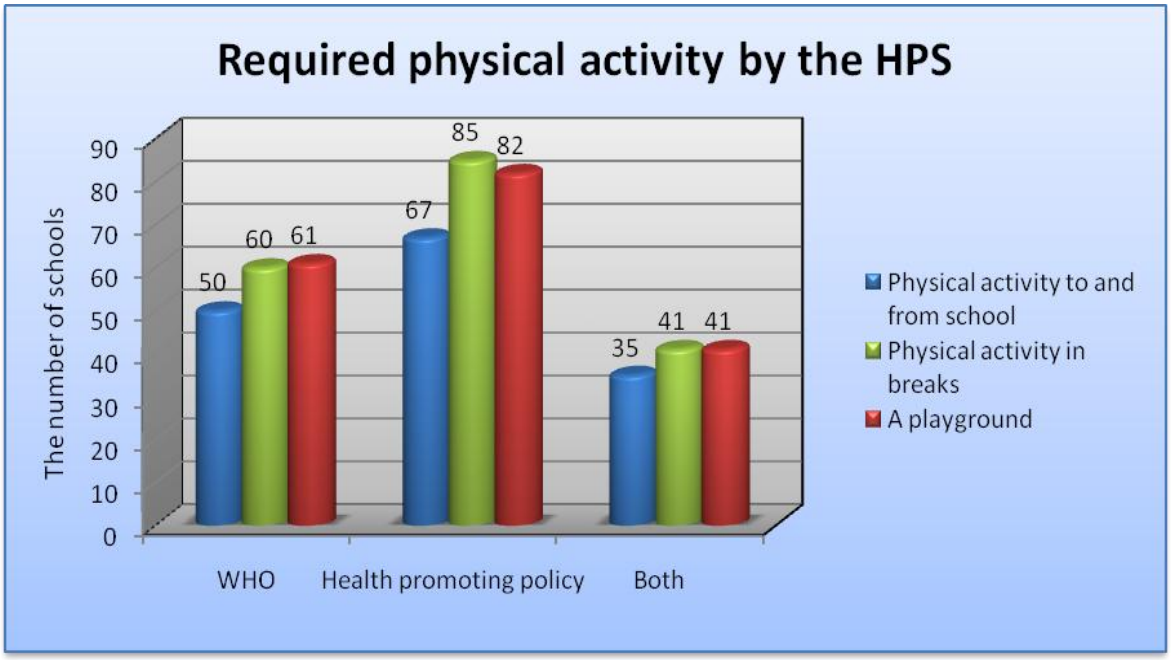

Figure 4.2.3.2 the physical activities of pupils during breaks and to and from school are promoted by different kinds of health schools, based on WHO principle, on schools own health policy or having both.

The questions in the survey were more focused on physical activity in a school health policy. Schools can promote physical activity for children by integrative activity in the school environment, so that may have a major impact on reducing obesity in children. Schools provide an environment and facilities with education for pupils to learn and practice physical activity. This is an effective way to help children build an active physical lifestyle, which has a better likelihood of continuing into adulthood. Physical activity in schools can enhance development of children; improve concentration in classes, promote emotional well-being and physical strength, etc. In a health promoting school, pupils should participate in organised physical activity for a certain time each day. The type and amount of physical activity is diverse depending on the age of the pupils.

In the WBQ, the questions asked if the schools encourage children to use safe and active methods to and from schools, such as walking or biking. The figure shows (see Figure 4.2.3.2) 81% schools with a WHO policy and 77% schools with a health promoting policy have promoted this activity. Moreover, 33% of schools with both policies have also encouraged pupils to use physical transportation activity. The result reveals most of the responding schools have promoted physical activity for the pupils. In addition to physical activity during transportation, almost all of HPS in the research required on going physical activities in breaks and the schools have a playground. These positive numbers signify that all HPS make great efforts to promote physical activity of children. There were 33 schools with a playground that has both policies, and have also promoted physical activities in breaks and transportation.

Children need to learn elementary motion skills in order to avoid injures in physical activity and develop health and fitness. Physical education that is provided by schools is an ideal way to improve pupils the knowledge about physical condition such as body composition, muscle and blood vessels, etc. Physical activity as a prioritized theme in curriculum activities can encourage activity among pupils, moreover, for some children, it maybe the only chance to shape an active physical life.

In the questionnaire, gymnasium was excluded in physical education. The figure shows (see Figure 4.2.3.3) the schools which have a WHO policy paid more attention to physical

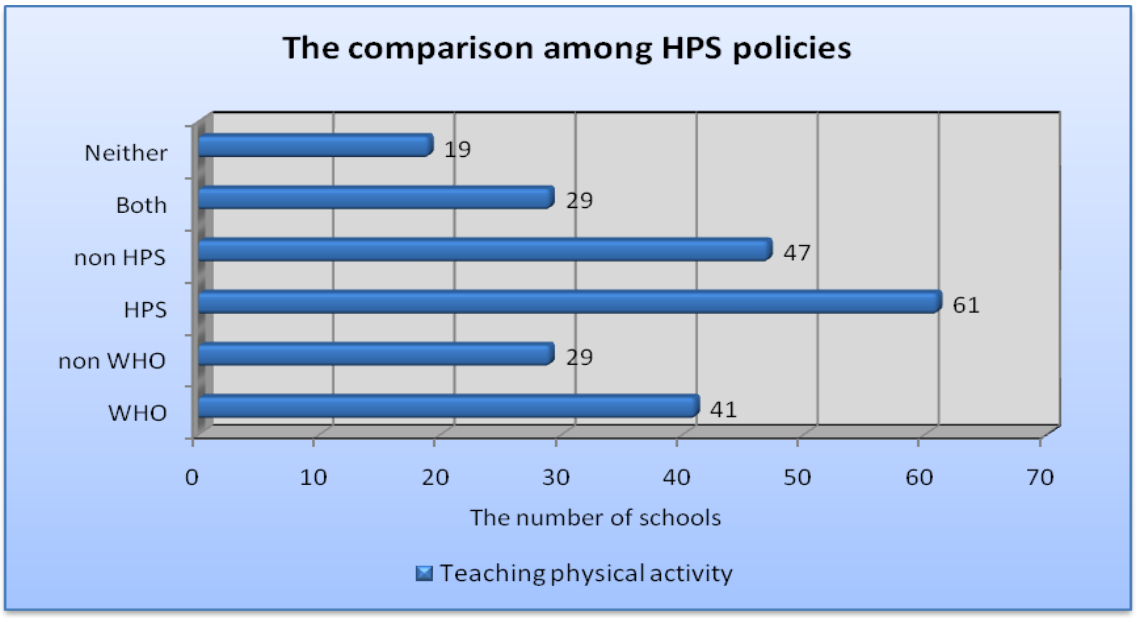

Figure 4.2.3.3 the comparison of HPS policies amongst the schools based on WHO principle or not, on schools own health policy or not, having both or neither of them, regarding the teaching physical activity.

activity education than the non WHO schools (which don't have a policy based on WHO principles). The same status occurred between the schools which have a health promoting policy and non HPS (don't have a health promoting policy). 70% of the health promoting policy schools has physical education. In a WHO policy schools it was a bit lower, 66%. The schools that have both policies were expected to have a higher percent, compared with the schools which only have one of the policies. Even though 69% is not a low percentage, it should be higher since they have adopted two policies. The schools that don't have any health promoting polices have the lowest number in the figure, 19 schools. On the whole, the schools which have a form of health policy are more positive in teaching physical activity.

It should be made clear that some of the schools have neither a WHO policy nor a health promoting policy, but they still provide physical education for pupils except gym. In order to understand which physical activity aspects the survey school is more interest in, the schools in the figure below (see Figure 4.2.3.4) were categorized just by teaching physical activity in schools.

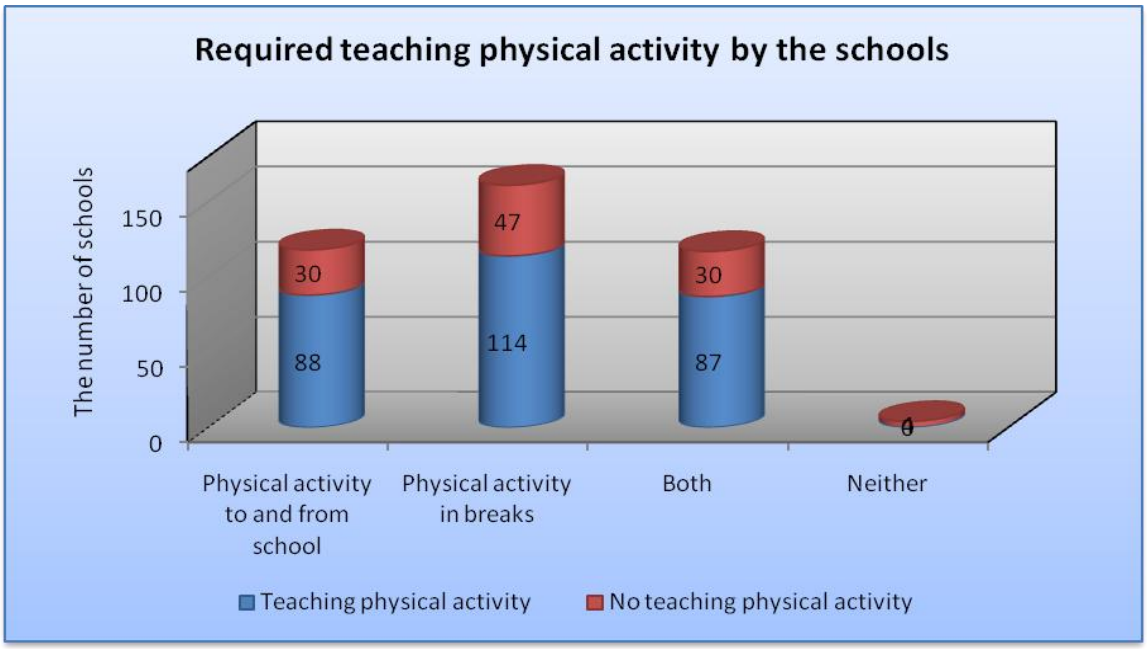

Figure 4.2.3.4 the physical activities in breaks and go and from school promoted by the schools that have/don't have physical activity education.

Physical activity during transportation and in breaks represents external and internal school activities respectively. The data shows that regardless if the schools have physical education or not, the number of schools promoting physical activity in breaks was always higher than promoting activities in transportation. For the schools that have a physical activity education, there were nearly the same numbers for only promoting physical activities during transportation of the school day and in both transportation and breaks. For the schools that don't teach physical activity, the numbers were exactly same. All the respondent schools more or less promoted one type physical activity, there was no school doing nothing. The figure shows that the schools that have a physical education program put more effort into physical activity for pupils than those schools which have no physical education program. These particular schools are more interested in the activity inside of school rather than the outside.

4.2.4 Green Flag School Program

The Green Flag School Program is organized by the Center for Health, Environment and Justice (CHEJ) in America. "Schools across the nation are using the Green Flag School Program to make their schools healthier places to work and learn. In the program, parents,

teachers, and kids work together to investigate environmental issues in schools, identify problems, create solutions, and put new programs into place (CHEJ, 2002).” The program explains why the environmental health issues are important to schools and how schools should work on these issues in order to provide a healthy environmental at school for pupils. The program guides school communities to teach pupils about environment issues, and to help schools improve their surrounding in order to become a better place to learn, e.g., whether school has good indoor air quality. Therefore, the schools capability and teaching activity can be improved by joining the program. Moreover, all schools have an opportunity to win the Green Flag Award for Environmental Leadership, if schools significantly change its environmental conditions (CHEJ, 2002).

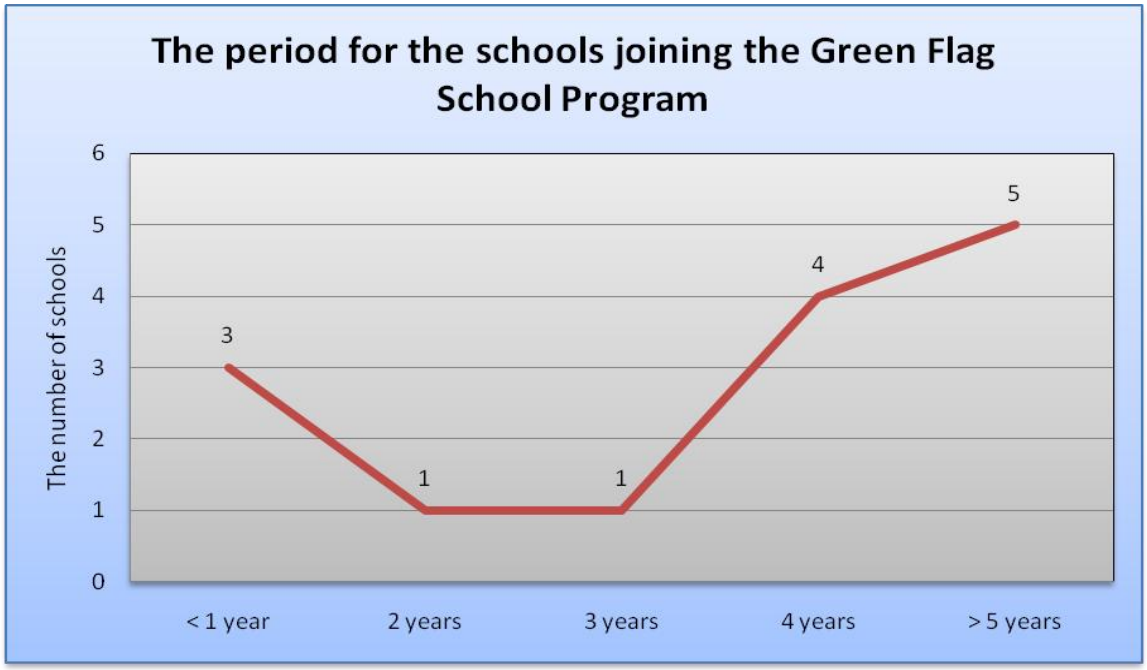

Figure 4.2.4.1 the tendency of joining the Green Flag School Program for schools over the last 5 years.

In the diagram (see Figure 4.2.4.1), there were a total of 14 schools (6 from Denmark and 8 from Norway) that are members of the program today. So in two countries, only a few schools participated in the Green Flag School Program over the last five years. At the beginning of the period there were 5 schools which joined the program, the average number increased by 2 schools each year. Obviously, the program hasn’t been popular yet in Denmark and Norway.

4.3 Serving practice

The serving practice is divided into five parts according to food provision type in the schools. School fruit and milk scheme means that the schools offer fresh fruit or milk for children each school day. The school tuck shop is a small place more like having a hole in the wall, so that pupils can buy lunch, either cold dishes, or food that can be heated by microwave oven. Unfortunately these schools don't provide a sitting down facility for the pupils to eat lunch. The schools with a canteen have a kitchen where warm/hot meals are prepared for pupils, and it also includes a sitting down facility.

Data shows that Danish schools have responded to all four schemes, but Norwegian schools responded mostly to the school fruit and milk schemes. However, some schools answered the school canteen section as well. In the section of the school tuck shop, Norwegian schools aren't counted in. This is due to the school food provision in Norway main focus on fruit and milk. The analysis of these 2 schemes is classified by countries. The last part is to find out the tendency of school food supply over the last five years, but only available for the schools with tuck shop or canteen.

4.3.1 School fruit scheme

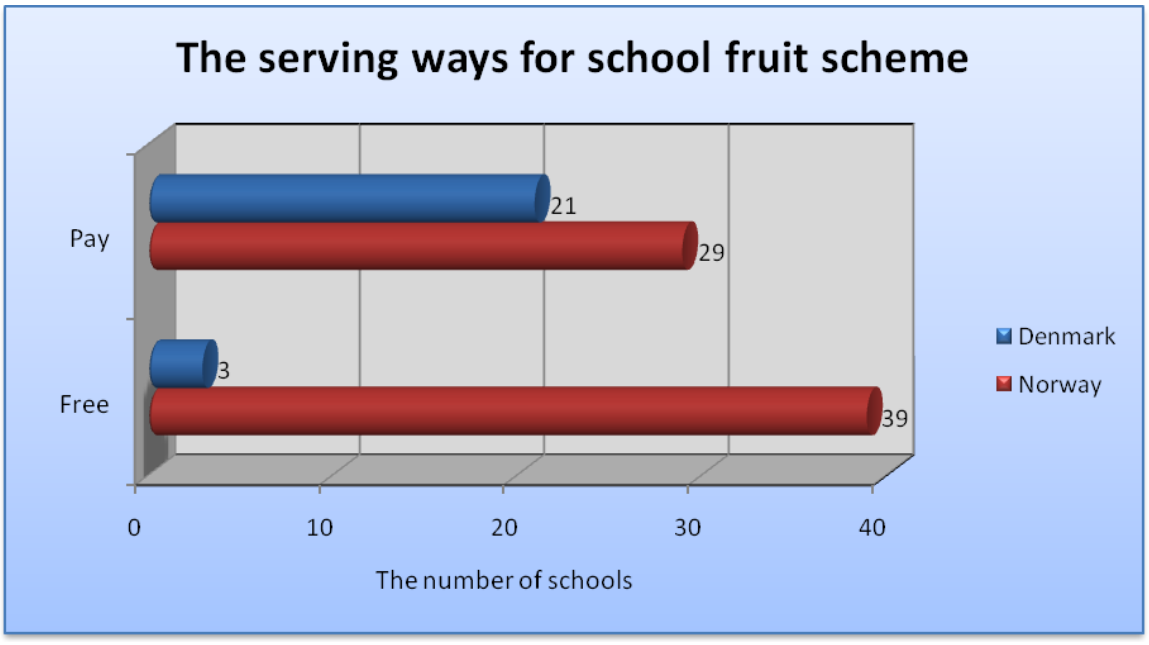

Figure 4.3.1.1 the manners for school fruit supply in Denmark and Norway

There are two ways for the schools to offer fruit for children, one is free of charge and the other is to pay. Not many Danish schools which answered that question compared with the Norwegian schools (see Figure 4.3.1.1). Most of these 24 Danish schools provide fruit with payment and only three of them offer fruit free charge. On the other hand, over half of the 68 Norwegian schools give the pupils free fruit everyday. In the other 29 Norwegian schools, the children need to pay if they want to eat fruit. It can be conclude that for the school fruit scheme Norwegian schools goes forward more than Danish schools, and they are also working on giving out fruit for free. It's believed that more pupils will eat fruit if it's free of charge. However, this depends on the economy, policy or attitude of the school, local authority or government.

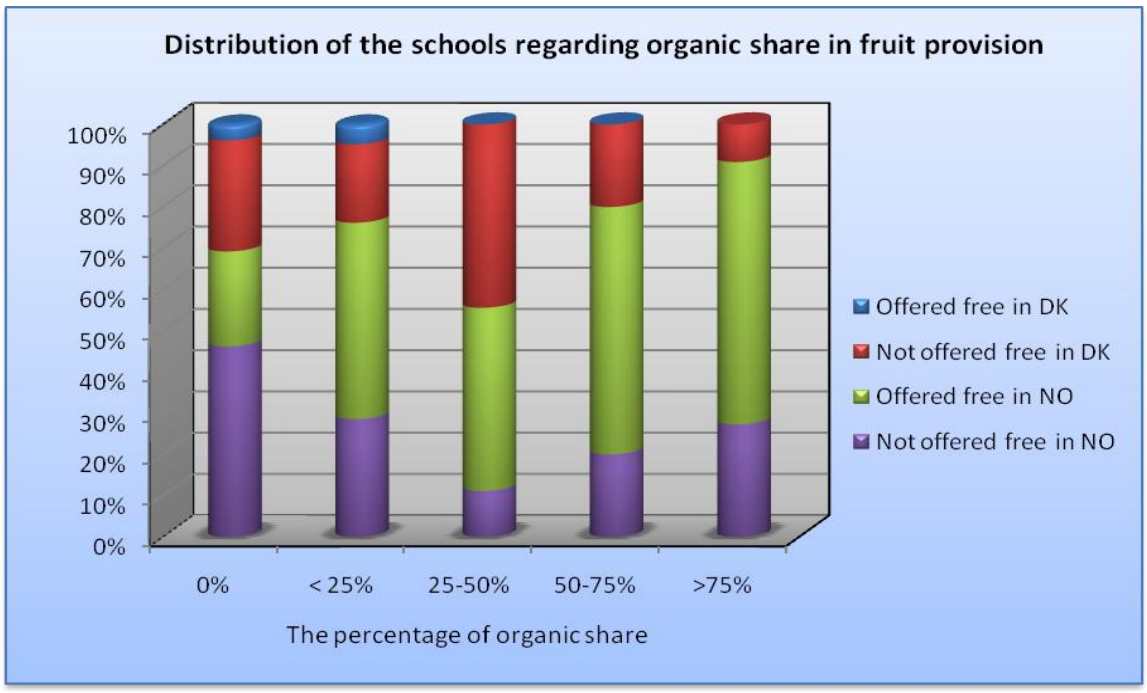

Figure 4.3.1.2 the distribution of schools that the fruit offered either free of charge or pay in Denmark and Norway in regard to organic shares.

The diagram indicates (see Figure 4.3.1.2) that the distribution of schools with free/paid fruit schemes has various organic shares, except that the Danish schools with free fruit supply at the range of over 75% organic share. The schools with the paid fruit scheme actually have less organic shares in different percentages than those which offer free fruit in Norway. For the schools that don't offer organic fruit at all, they were mostly the paid fruit scheme schools. In Denmark apart from a few schools which provide free fruit

(which is under 25% organic share), there were nearly no schools offering free organic fruit for pupils. On the other hand, the Danish schools with a higher organic fruit share, over 25%, the fruit was all provided by paying. A very high degree of organic share as over 75%, these schools were mostly distributed in Norway, and the fruit they offer is free. This situation is the same as organic share stays between 50% and 75%. The result for Norwegian schools is optimistic, because it seems that the schools which give free fruit to children are willing to provide organic fruit. This is an ideal way to encourage pupils to eat/learn about organic fruit. It's remarkable that the schools in both countries that don't offer free fruit are relatively inactive on organic fruit issues.

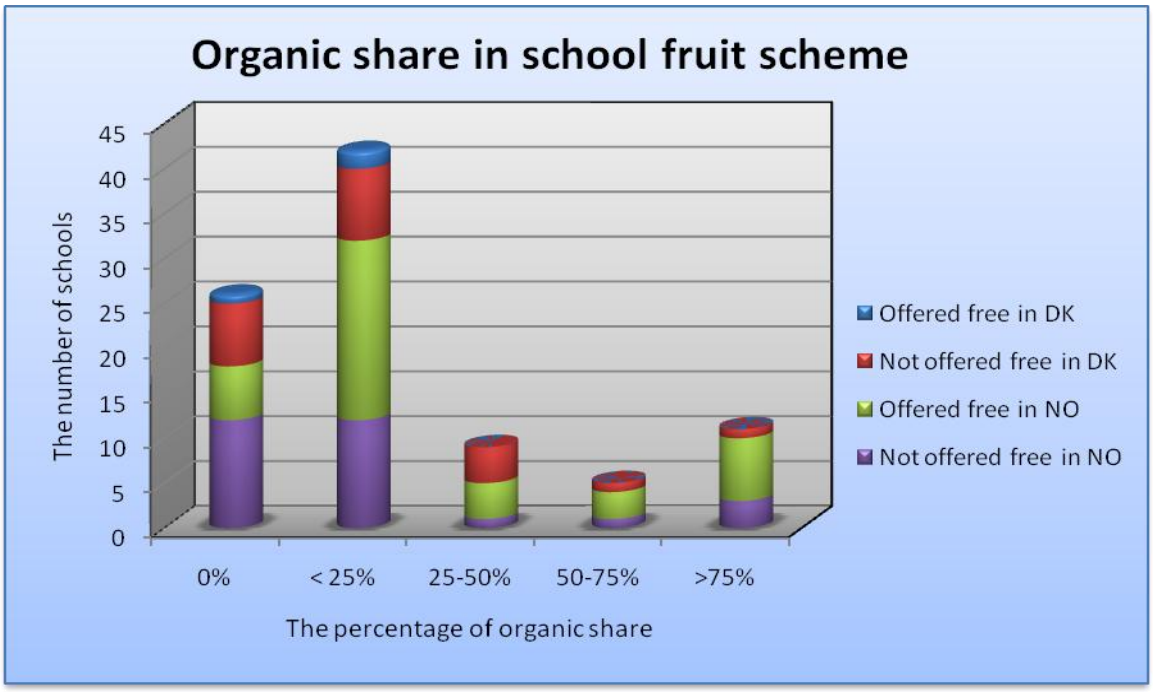

Figure 4.3.1.3 the percentage of organic share in the school fruit scheme according to the ways of giving out fruit by the schools in Denmark and Norway. The fruit is offered either free of charge or pay.

Different from the last chart, this diagram (see Figure 4.3.1.3) give an answer for the organic share based on the number of schools. From an overview, organic share for the schools which have a fruit provision were most under 25%, and most of them were Norwegian schools. The majority of schools either offer conventional fruit or a low percent of organic fruit. The number of schools with a 75% organic share was a bit more

than the schools with 25-50%. Therefore, the amount of organic fruit is still poorly provided by the schools in both countries, even lower in Denmark.

4.3.2 School milk scheme

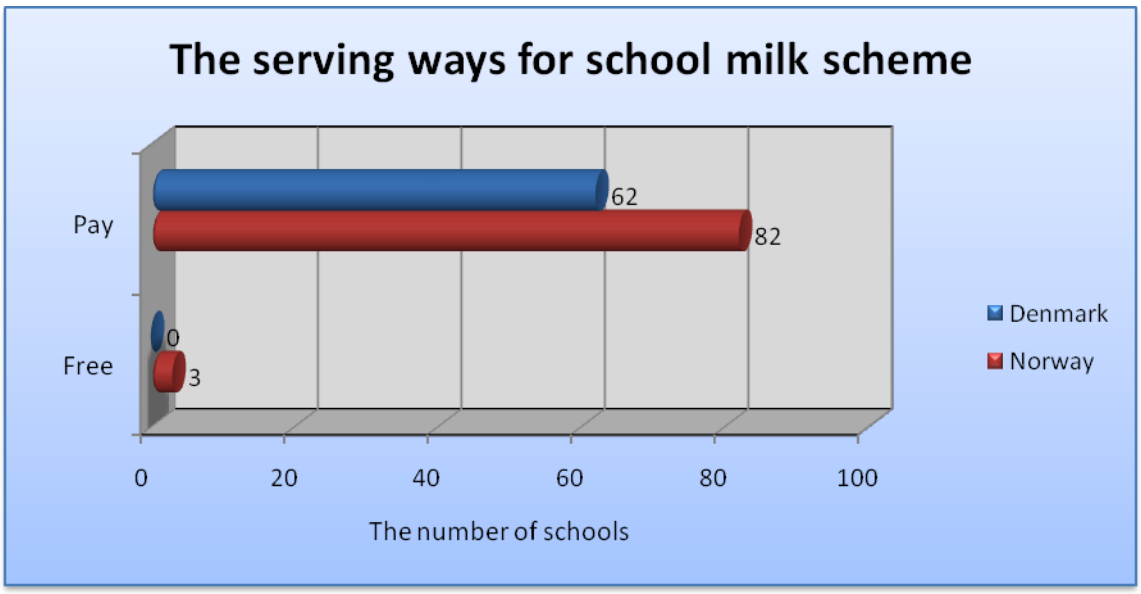

Figure 4.3.2.1 the number of schools with milk supply according to their serving methods in Denmark and Norway.

In the same principal as the school fruit scheme, there are two ways for the schools to offer milk, one is a completely free supply, and the other is to pay. In total, 62 Danish schools and 85 Norwegian schools have responded to the question about school milk provision (see Figure 4.3.2.1). There were no respondent schools in Denmark that provide free milk for pupils. Only three schools offer free milk in Norway. However, the number of free milk scheme schools was too little to count, so it can be said that in both countries the children need to pay for the milk which is offered by schools if they would like to have one. In order to get an accurate analysis, the number of free milk supply schools is still included as a result.

The bars below highlight (see Figure 4.3.2.2) that most danish schools with milk provison offer organic milk for children. The organic milk share is diverse in milk supply. In the range of under 25% organic share, 70% of schools were distributed in Denmark. A bit higher, between 25% and 50% organic share, almost all the schools were from Denmark.

This status extends to the over half of milk provision is organic milk. The minority of organic milk scheme were still Norwegian schools. If the amount of organic milk at school is about 75% or even 100%, this is considered as high organic share in school milk provision. There was no Norwegian school situated in this range, only Danish schools. Most of the Norwegain schools offer conventional milk for pupils, about 90% of conventional milk schools in the graph were situated in Norway. A few Norwegain schools also offer organic milk, but the combined amount was less than 25%. Very few schools were over 25% organic share. This shows that organic milk in Norwegian schools is not so widely spread compared with Danish schools. It might be a better idea to sell organic milk in schools, as the milk isn't free of charge anyway.

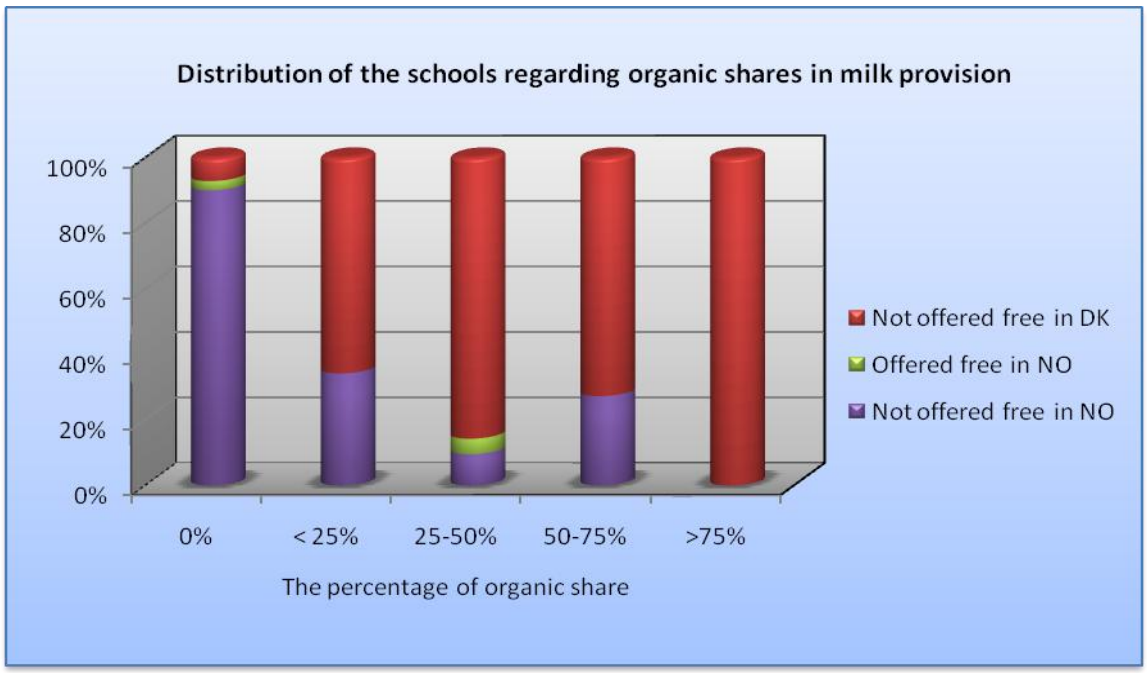

Figure 4.3.2.2 the distribution of schools that offer milk either free of charge or pay in Denmark and Norway in regard to organic shares.

Even though the schools in Denmark provide more organic milk for their pupils, the average of the organic share in school milk scheme was approximate 33%. 25 out of 62 Danish schools were standing in the range of less than 25% organic share, and the rest were 13 Norwegian schools (see Figure 4.3.2.3). The second highest percent of organic share for Danish schools was between 25-50%, 18 Danish schools and only 3 Norwegian

schools. So the trend of organic share in the school milk scheme is a higher percent of organic share, for a fewer number of schools.

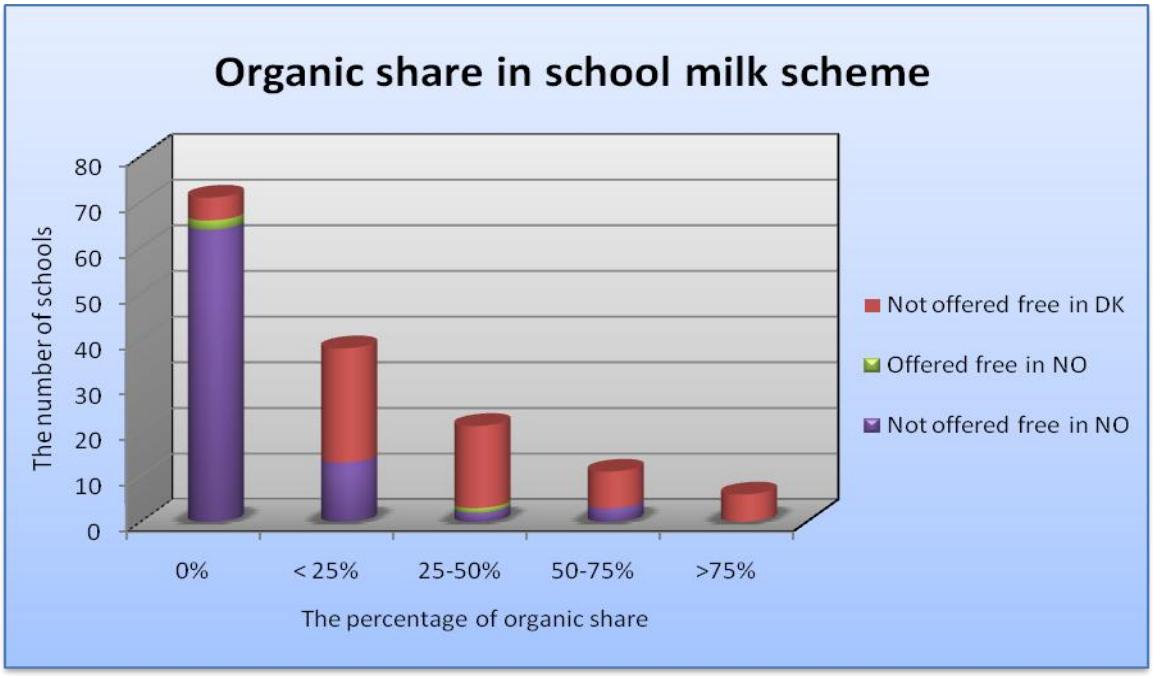

Figure 4.3.2.3 the percentage of organic share in the school milk scheme according to the ways of distributing milk by the schools in Denmark and Norway. The milk offered is either free of charge or pay.

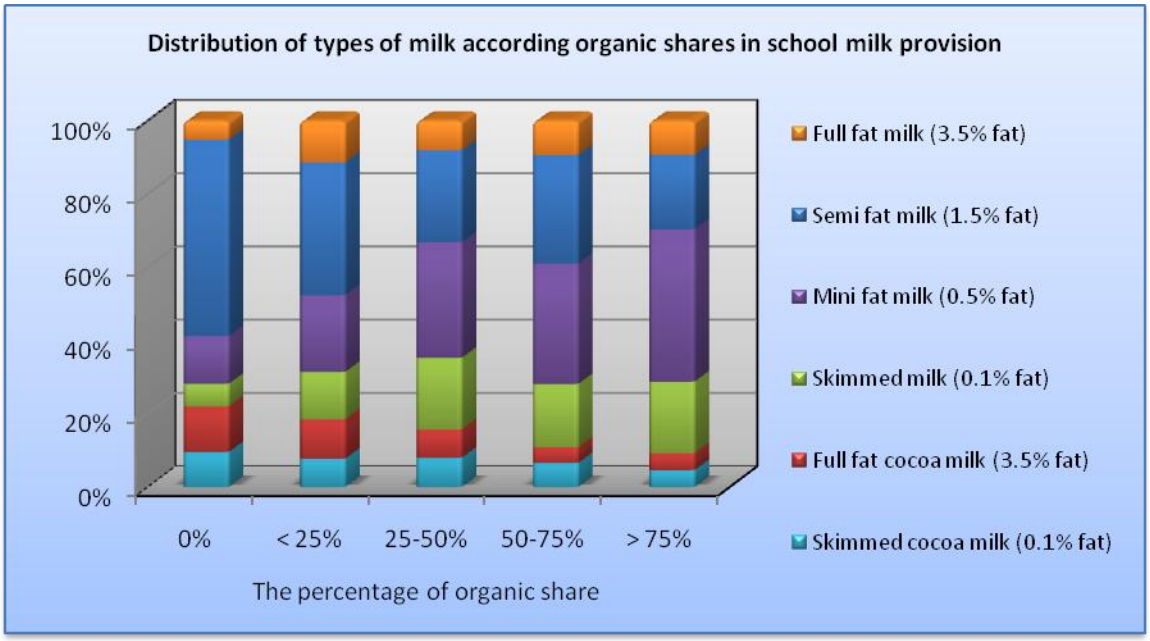

Figure 4.3.2.4 the distribution of different types of milk in regard to different percentages of organic share in school milk scheme.

There are many types of milk product in the market today. Research was interested in which kind of milk products is involved in the school milk scheme, and which types are favored by the schools. The types of milk in the questionnaire were mainly distinguished by fat content in the milk such as full fat milk (approx 3.5% fat), skimmed cocoa milk (approx 0.1% fat). The purpose was to find out the distribution of milk type in relation to their organic share in schools.

From an overview of the chart (see Figure 4.3.2.4), semi fat milk (approx 1.5% fat) and mini fat milk (approx 0.5% fat) were distributed most in these two countries schools. On the contrary, skimmed cocoa milk was the least. The distributions of full fat milk and full fat cocoa milk (approx 3.5% fat) were a bit wider than skimmed cocoa milk. Skimmed milk (approx 0.1% fat) was relatively less than mini fat milk. Among the schools with conventional milk provision, semi fat milk was most popular milk provided to the schools, then mini fat milk, and full fat cocoa milk were next. Full fat milk and skimmed cocoa milk were the least.

According to previous analysis, the majority of the Norwegian respondent schools offer conventional milk, so it can be said that semi fat milk is the most common type of milk in Norwegian schools. For the schools that provide a certain amount of organic milk, most were answered by Danish schools, and semi fat milk and mini fat milk were distributed almost equally. The difference is that the higher percentage of organic shares, the wider the distribution of mini fat milk, and the lower amount of semi fat milk. The status of skimmed milk stayed nearly the same among the schools with organic share over 25%, the same as full fat milk but it wasn’t as widespread. Full fat cocoa milk was gradually decreasing in the range of the whole organic share.

Consequently, the organic milk scheme schools offer lower fat milk than the conventional milk scheme schools. Moreover, in the group of organic milk provision schools, the schools with a higher organic share provide even lower fat/sugar milk than the others. The analysis of the distribution of milk types was based on the average value of answers (see Appendix H).

4.3.3 School tuck shop

There were only 3 Norwegian schools that have responded this section, so the amount of schools is too few to analyze. The 41 Danish schools answered the questions, 7 of them prepare the school meals at the school site, the rest order food from outside of schools, e.g., a public central kitchen in a downtown location, or a private catering company.

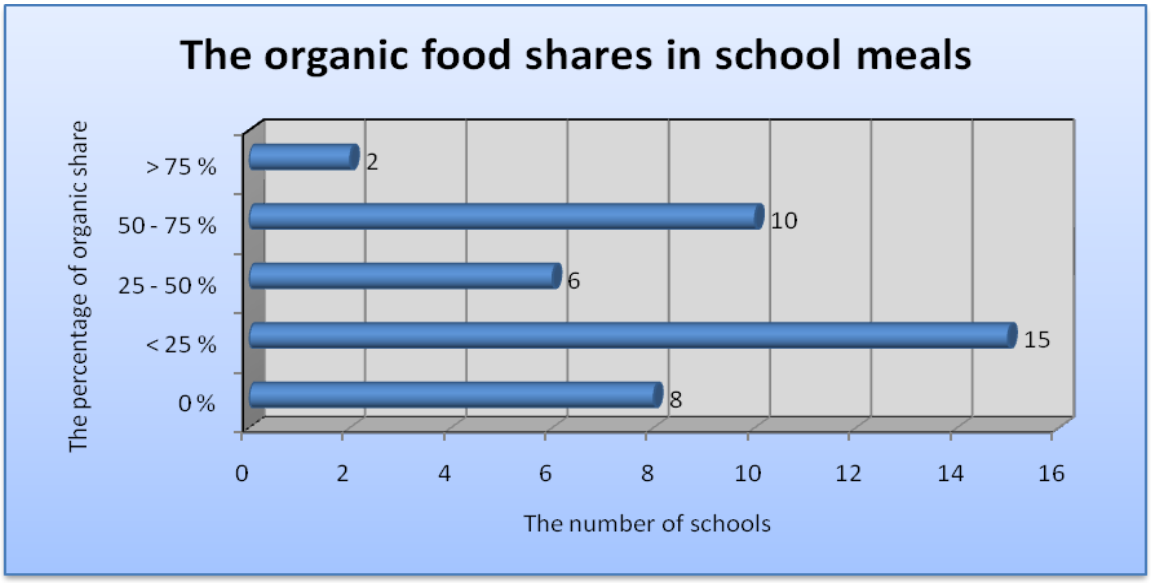

Figure 4.3.3.1 the percengate of organic ingredient in foods that provided by school tuck shop.

Most of these Danish schools more or less have organic ingredients involved in the school meals (see Figure 4.3.3.1). 8 schools only sell conventional food for pupils. Most of the schools offer organic meals that contain 25% organic share in whole school food supply. The number of schools have 50-75% organic share was actually more than the number of schools which have 25-50%. Only 2 schools contain over 75% of organic food in their school meals. Generally, the organic food shares of school meals in Denmark was under 50%.

As above, most of the schools have an agreement with a public central kitchen which produces all the food and sends it out to the schools everyday. For example, all the primary schools in Copenhagen get their school meals from a central kitchen. The kitchen works a lot on no/ less fat organic food. The menus are designed by the expert in the kitchen, but the municipality of Copenhagen is also responsible for the principle of the

menu. The central kitchen has to buy organic products from a certificated organic supplier. In the public central kitchen, there is an employee who works as a coordinator between schools and kitchen. The coordinator measures the amount of meals is sent to the different schools in order to reduce the waste.

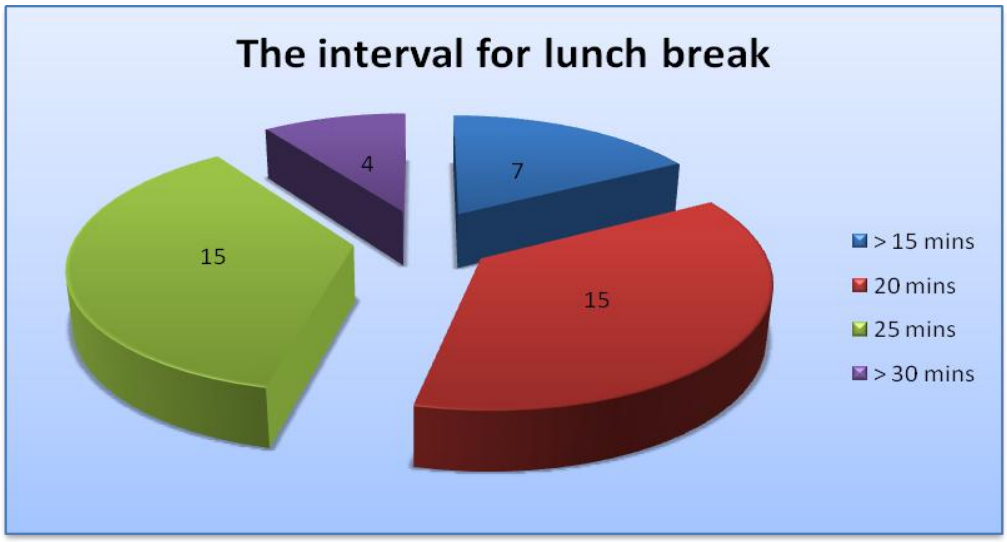

Figure 4.3.3.2 The interval of time for lunch breaks in the schools

As a matter of fact, the lunch break decides whether pupils have enough time to enjoy their meals. If the lunch break is too short, e.g., under 15 minutes, children might skip their lunch and be hungry for the rest of the day. This also effects the childrens concentration on lessons. If the lunch break is a proper length of time, e.g., around 25-30 minutes, more children might be willing to have lunch, and they can enjoy meals while having a social time. The pie chart shows (see Figure 4.3.3.2) that the time for lunch breaks varies among the schools. The number of schools which have a 20 or 25 minute lunch breaks were equal. Only 4 schools hold break over half an hour, and 7 schools have less than a quarter. Thus the majority of respondent Danish schools take lunch breaks between 20 and 25 minutes.

Some Danish schools have restrictions on which type of foods and snacks are allowed to be sold in the school tuck shop. In the survey, there were 28 schools which have rules regarding it and 13 don't have any rules. There was a positive response from both types of schools, because they don't provide unhealthy snacks in the tuck shop, such as

chocolate, candy, chips and fizzy drinks. As described earlier, the school tuck shop is considered a very small place, and the setup is usually far away from a canteen, so the food items offered by a tuck shop are limited. In the WBQ, some common tuck shop foods provided by school are sandwiches, cold dishes (sushi box, burger box, pasta box and salad box, etc.), reheated meals (rice, meat sauce, etc.) and cake.

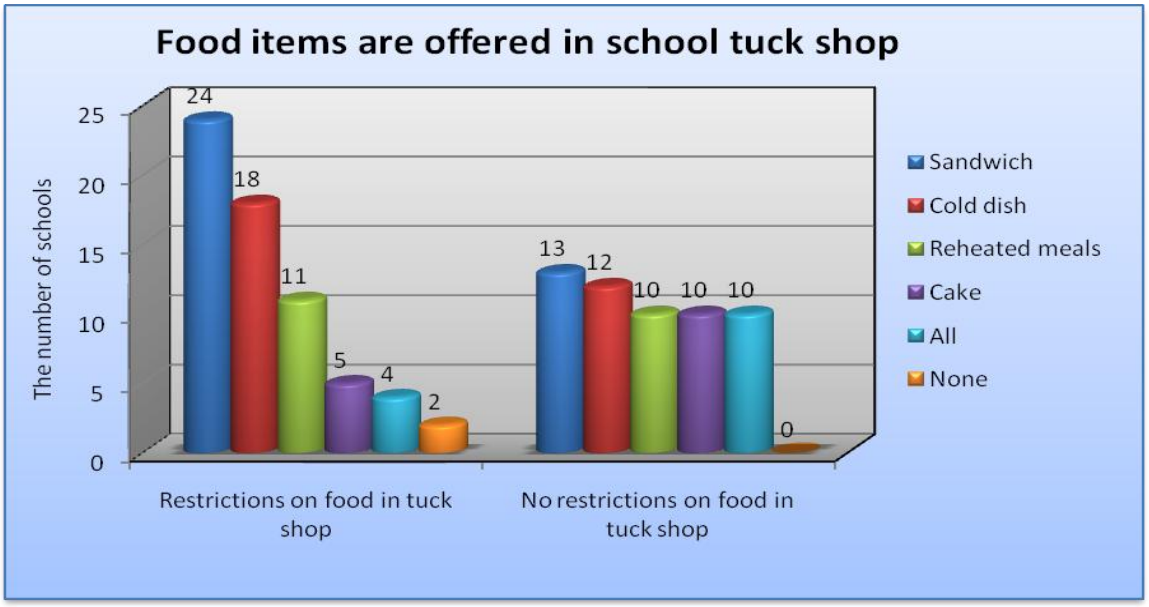

Figure 4.3.3.3 the types of meals are offered in school tuck shop by types of the schools that have/don't have restrictions on sold food items.

The study compared the schools with/without restrictions on foods in the tuck shop, in regard to items which are provided (sees Figure 4.3.3.3). Most of the schools with the restrictions are in favour of sandwich and cold dishes. Less than half the number of the schools with restrictions provides reheated meals and only a few schools offer cakes to the pupils. The number of schools that sell all mentioned food items was even lower. All the schools without the restrictions sell sandwiches and quite often cold dishes as well. The majority of schools without the restrictions provide reheated meals and cake in the tuck shop. 77% of the schools offer all of the food items. Therefore, the number of schools which have restrictions on tuck shop food, the pupils are more likely to buy sandwiches and cold dishes rather than reheated meals and cake, than the number of schools where no restrictions apply. There were two schools with restrictions which don't supply any of these food items from the tuck shop. However, some schools didn't make

restrictions by themselves, but through guidelines by the municipality. For instance, the municipality of Copenhagen decided to implement the school meals service in all primary school in Copenhagen County, so they also make rules for school foods and take responsibility for menus.

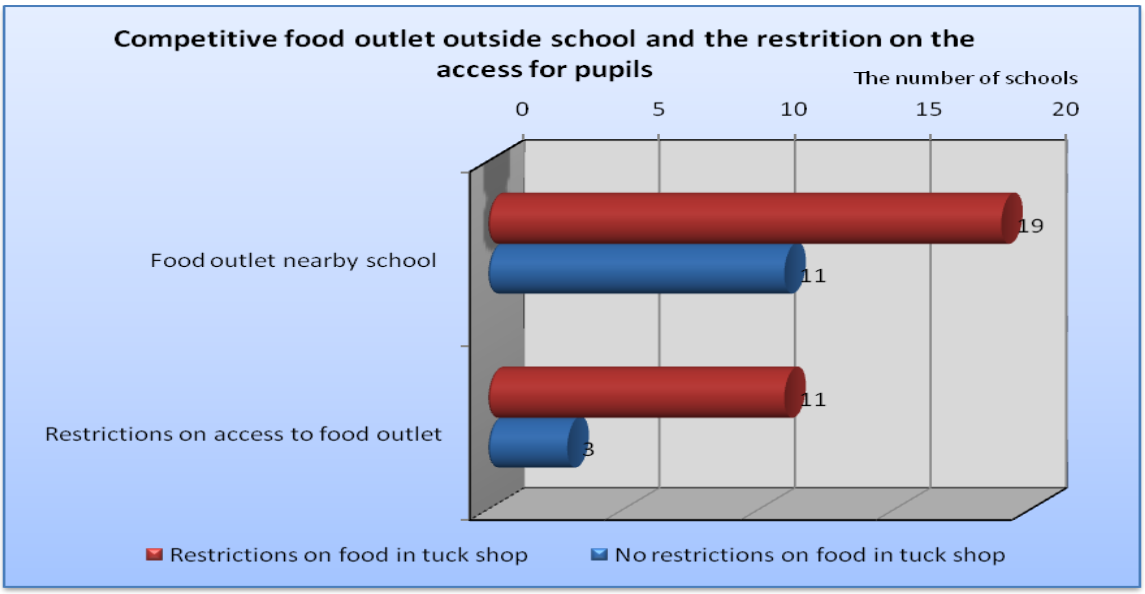

Figure 4.3.3.4 the types of school that have/don't have restrictions on sold food items in relation to their restrictions on the access to competitive food outlet nearby school.

Even though the schools have offered school meals for pupils, some of them still don't buy food from the tuck shop. A good example from Copenhagen region, some primary schools in Copenhagen sell a lot of food because of the location of the school. There aren't any fast food shops around. Some schools don't sell very much, because there is many another food outlets close by, where it could be an option for the pupils, especially if the food is cheaper than in the school tuck shop.

In the survey, there were 30 schools (see Figure 4.3.3.4) which responded that they have food outlets nearby (shorter than 250 meters). The research was interested in these schools and whether they have any kind of restrictions for pupils to access these competitive food outlets nearby. The chart indicates 14 of 30 schools have made restrictions about it, but that is still under half. Amongst 14 schools, 11 of them also have restrictions on food items in the tuck shop. In other words, the schools which have restrictions on the types of food in the tuck shop, they also pay more attention to the

pupils who leave the school and buy food from fast food shops nearby. This is opposite for the schools without the restrictions.

4.3.4 School canteen

School canteens play a special role in the education of the pupils. A healthy school canteen not only provides food for children, but also promotes good quality and affordable healthy meals. It's also necessary to support class activities. As mentioned in the theory section, the schools in Norway rarely have a canteen. However, in the WBQ there were actually some Norwegian schools that have canteens for children. The number of these schools is very low compared with the total amount of schools in Norway. It's interesting to see the results from the case study in Norway. In the survey, 55 schools (33 from Denmark and 22 from Norway) have responded to the school canteen part. Even though schools have a canteen, the meals are prepared through two ways. There were 43 schools (23 from Denmark and 20 from Norway) that cook food on school site, and 10 schools (only from Denmark) which get meals from a public central kitchen or a local private catering company. So for those schools that get lunch from an out of school site, their canteen is more like a serving facility.

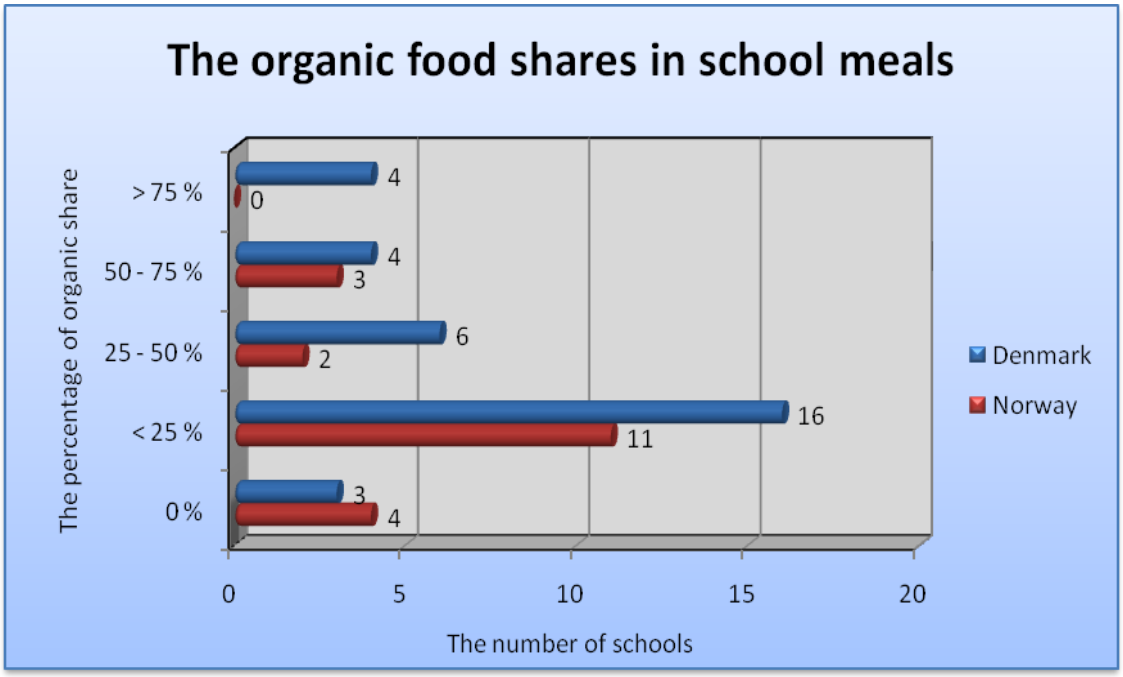

Figure 4.3.4.1 the percengate of organic ingredient in foods that provided by school canteen.

Obviously it can be seen (see Figure 4.3.4.1) that the schools in both countries which have organic share were mostly under 25%. The number of Danish schools providing organic food was more than Norwegian schools. Among the respondent schools in Denmark, 91% of schools offer a certain amount of organic food in canteens. When the organic share was over 25%, the number of schools fell remarkably from 16 to 6 in Denmark, and 11 to 2 in Norway. There were no Norwegian schools offering 75% or more organic food in school meals. The number of schools involving 50% or more organic ingredients in school meals was poor in the diagram. Therefore, the current organic share percentage in meals offered by school canteens are pretty low, especially in Norway. It seems most of the schools more or less blend organic food in, which is a good start.

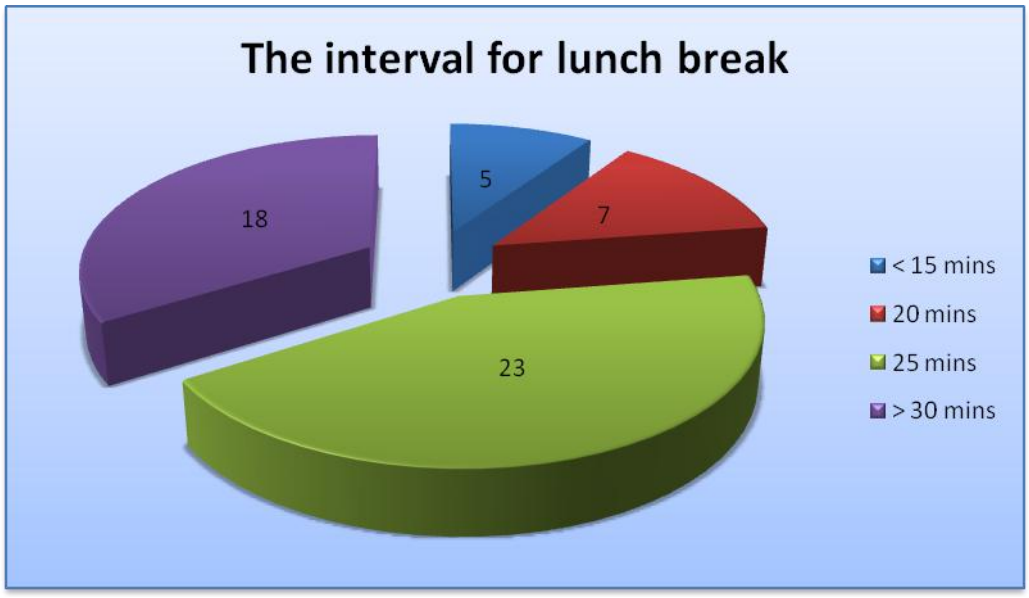

Figure 4.3.4.2 The interval of time for lunch breaks in the schools.

The same as in tuck shop section, it also asked the duration of lunch breaks in schools. The difference is that the schools with a canteen apparently hold longer breaks than the schools with a tuck shop (see Figure 4.3.4.2). About 42% of schools take lunch breaks of around 25 minutes, but 33% decided to have over 30 minutes for a break. Few schools take breaks which less than a quarter of an hour and 13% of schools have a 20 minute break. From an overview, the schools with a canteen would like to hold sufficient lunch breaks for pupils. Children could eat their lunch with sitting down facilities, giving them

enough time to chew their food. Since the schools have a canteen, the longer breaks may also attract more pupils to choose school food instead of bringing a lunch box or buying food in fast food shops. Moreover, the schools can encourage pupils to participate in kitchen work so that they can learn directly about healthy food issues.

School food service is like any another business. They need to have recommendations on operational practices and management to run effectively, e.g., menu design/selection, canteen management, food safety, and kitchen operation practices. The standard for menus is tightly bound with the health of pupils. The Danish Institute for Food and Veterinary Research has made a nutritional guideline for school meals. The official of the school meals program in the municipality of Gladsaxe helps to make the nutritional guideline, because they have many practical experiences with the school meals program. This is not a mandatory policy, but some schools have adopted for school food menus in Denmark. For example, the municipality of Copenhagen has carried out this nutritional guideline for school meals. They try to optimize the menu according the guideline, but sometimes it's quite hard on serving practices. If the nutritional guideline suggests that schools should offer fish dishes, and the pupils don't like to eat it, the dishes have to be returned because of no one buying it.

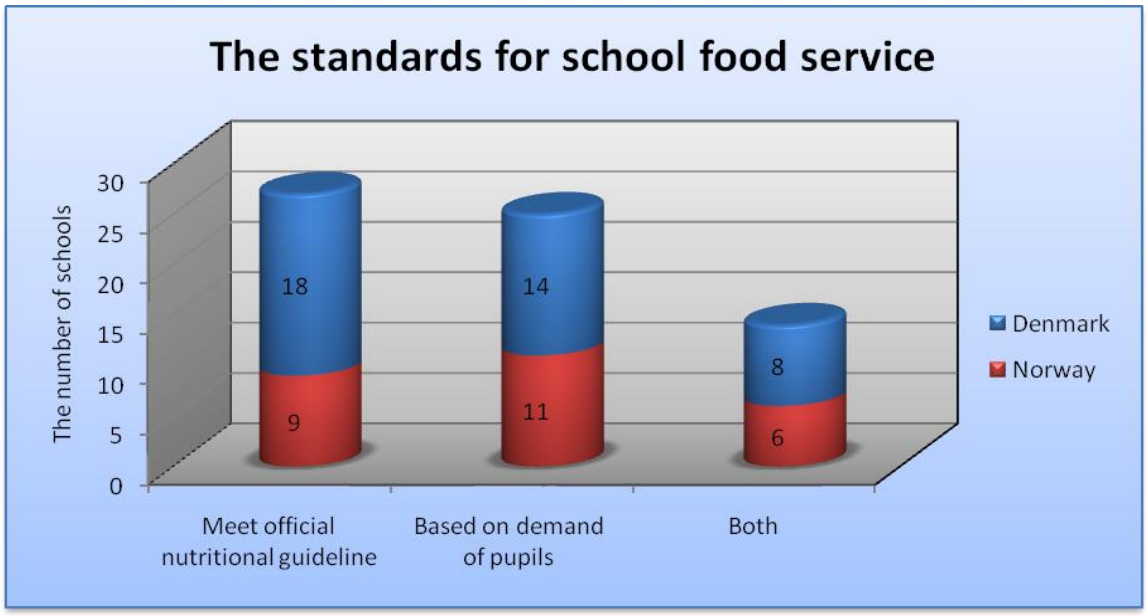

Figure 4.3.4.3 the number of the schools' food service/menus comply with official nutirional guidelines, based on the demand of children or both.

The research was to explore the standards for school food menus that depend on a nutritional guideline or the demand of pupils. Data shows (see Figure 4.3.4.3) 18 Danish schools and 9 Norwegian schools were complying with the official nutritional guideline. Thus a majority of respondent Danish schools meet the official nutritional guideline for the school meals. Half of the Norwegian schools design the menu based on the demand of pupils. There were also some schools from Denmark designing the menus according to the demand of children. There were only 8 Danish schools and 6 Norwegian schools where menus meet the official nutritional guideline meanwhile depending on the demand of pupils. Hence the distribution of two kinds of standards for school food menus was almost the same, but for the number of schools which have both was much less. This might tell us that Norwegian schools put a little more emphasis on the demand from pupils, but it's vice versa in Denmark.

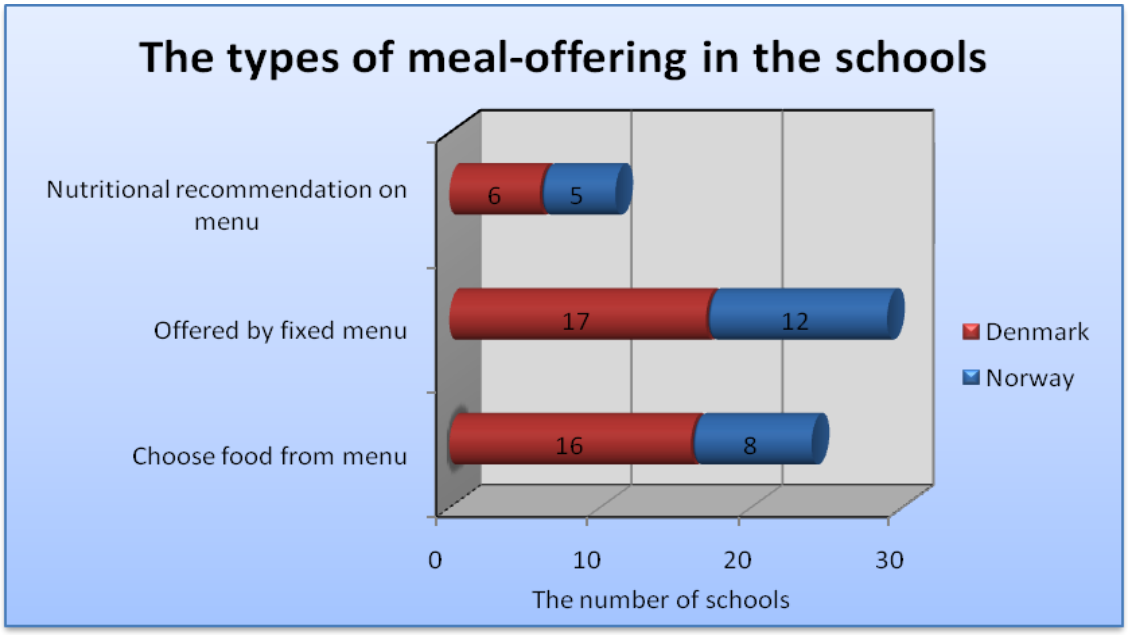

Figure 4.3.4.4 the types of meal-offering for pupils in the canteens

There are two ways for pupils to choose food in school canteens, either by fixed menu or by choosing food themselves from menu. The fixed menu at the schools meet the official nutritional guildelines could be called a healthy fixed menu. If the schools offer the fixed menu, the pupils don't spend so much time choosing the food items. This might be a reason why some schools take short lunch breaks. The fixed menu may reduce the

amount of users because of less diversity. If the schools offer various food items which pupils can choose, e.g., salad bar or a buffet, it may increases the number of pupils that eat lunch in school canteens. Some schools have given nutritional recommendations for pupils on what they should choose from menus in school canteens.

The figure indicates (see Figure 4.3.4.4) that more schools offer fixed menus than chosen menus in Norway but the status is nearly the same in Denmark. There were 6 Danish schools and 5 Norwegain schools that recommend the pupils to select healthy food from school canteens. Unfortunately most of the schools don't have nutritional recommendations on menus for children. The type of meal-offering in the schools can possibly effect the children's choice of eating in the school canteen. There are some factors which influence what pupils choose from the school canteen, like the cost, taste or appearance of the food. It's common that pupils choose cheaper food as a priority, or pupils' parents if they order food for their children. The taste and appearance of food are also an important from the aspect of sense. Pupils would rather buy the food they have tasted before than try a new taste in case they will like it, and wouldn't want to waste their money.

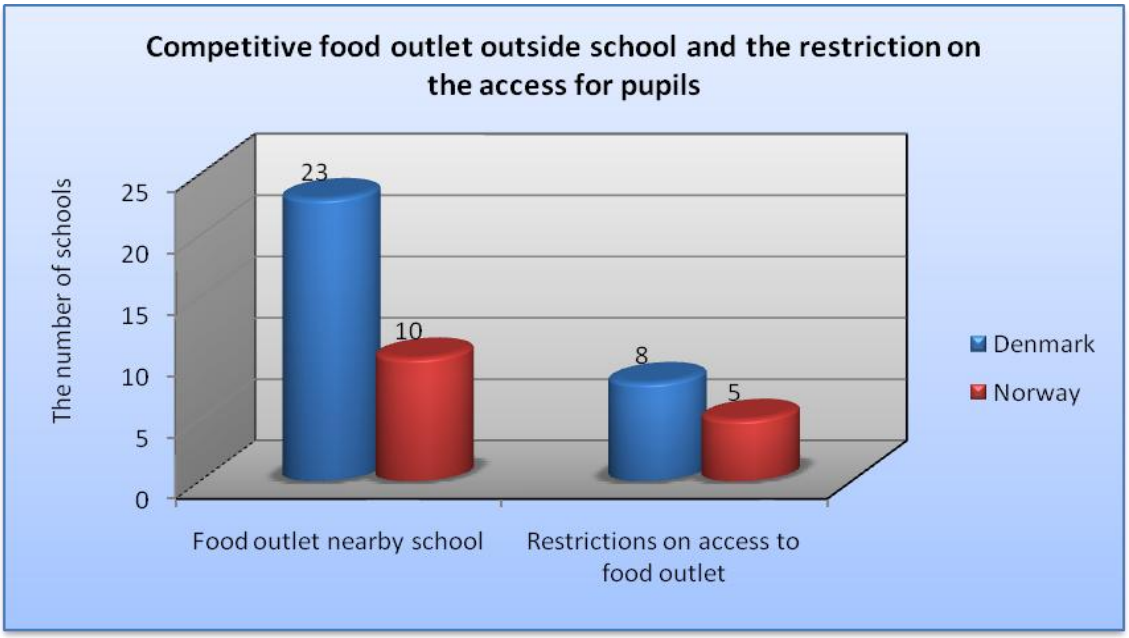

Figure 4.3.4.5 the restrictions made by schools on the access to the near competitive food outlet

Since the schools have canteens to prepare warm/hot meals, it should be convenient for pupils to have lunch. However, for some pupils, especially from the upper grades, they would like to stay in a group to smoke, talk or buy fast food during their lunch break. Here the questionnaire contributes to repeat the question regarding restrictions on access to the competitive food outlets nearby the schools. 23 of 33 Danish schools have food outlets nearby, and only 8 Danish schools have made rules for which pupils are allowed to leave the school to access other food outlets close by (see Figure 4.3.4.5). In Norway, only 5 schools that have competitive food outlets nearby made restrictions about access.

4.3.5 The availability of food items

In the WBQ, 13 representative food items were listed, 1) fresh vegetables such as lettuce, cucumbers, carrots, tomatoes green beans etc, 2) fresh fruit such as apples, pears, peaches, oranges, grapefruit etc, 3) meat such as chicken, pork chops, steaks, fish, lean hamburger etc, 4) whole grain products such as whole grain bread, whole grain pasta, whole grain cereal, oatmeal etc, 5) beverages such as free cold drinking water, 100% fruit juice, tomato juice, herb tea etc, 6) low fat dairy such as low fat milk, low fat yoghurt, low fat sour cream, low fat cream cheese etc, 7) deep fried food such as pommes fries, chicken nuggets, fish fingers, hamburgers, etc, 8) sausages, 9) chocolate/chocolate bars, 10) candy, 11) chips, 12) cake, and 13) fizzy drinks.

All of chosen food is considered commonly served food items in schools. In the survey food items were classified mainly based on fat/sugar content and levels of calories. The first 6 food items are considered as healthier because they contain relatively lower fat/sugar content and calories. The rest of the 7 items are unhealthier food for pupils because they have relatively higher fat/sugar content and calories. The purpose of the questions was to uncover the tendency of food availability in schools over the last five years.

On account of there being only three schools with a tuck shop that answered the questions, the result will leave them out and only analyze the schools with canteens. The chart shows (see Figure 4.3.5.1) that in both countries the schools have provided less and less unhealthy food in canteens over the last five years. The Danish schools have mainly

reduced offering chocolate/chocolate bars, and the others were almost on the same decreasing level. The schools from Norway have mostly decreased the amount of fizzy drinks, and second was chocolate/chocolate bars, but offering candy was relatively higher than other unhealthier items. Healthier food items have been served much more in the school canteens over the last five years. Fresh vegetables and fruit have increased a great deal among the Danish schools, and beverages have gained the least. In Norway, because of the school fruit scheme, there was a large quantity of fresh fruit that were offered by schools. Norwegian schools have promoted fruit most. However, an exception from Norway is that meat products have been offered less in schools. The other healthier food items have gained more or less at the same rate. So the figure draws an ideal result, serving practices have changed in school canteens with a healthy food provision tendency. The schools offer more healthy food and less unhealthy items for pupils. The analysis of the development of food items was based on the average value of answers (see Appendix I).

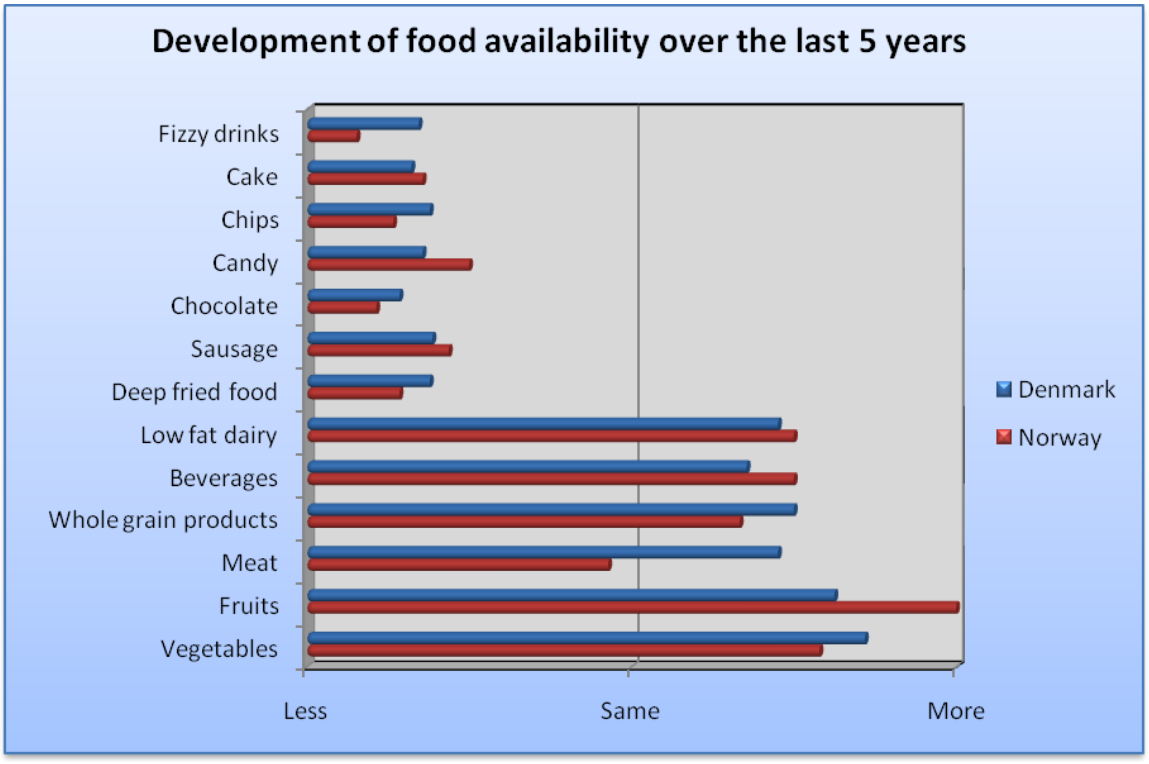

Figure 4.3.5.1 the development of food items that offered by the schools with a canteen over the last five years.

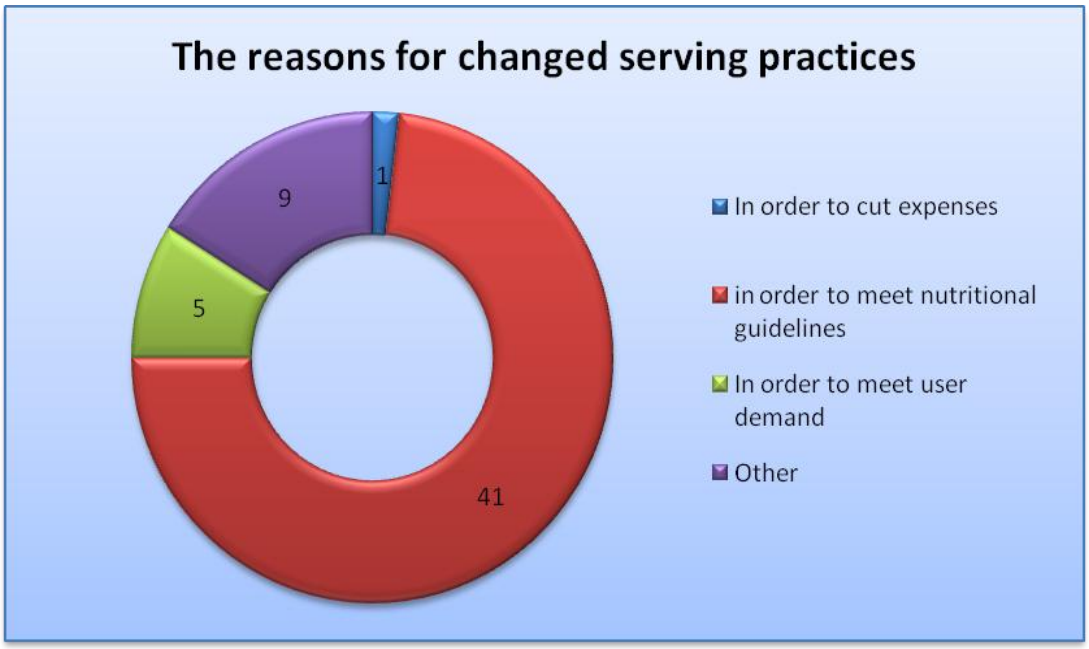

Figure 4.3.5.2 the reasons for changed serving practices in the schools over the last five years.

The figure explains (see Figure 4.3.5.2) several motivations as to why the schools have changed food items in school canteens. 73% of the schools have promoted these serving practices due to the nutritional guidelines. One school from Denmark changed their serving practice in order to cut expenses on school meals. Several schools have changed on account of the demand of pupils. 16% of schools have other reasons, e.g. to meet policies about health food in schools, from parents requests for pupils, etc. The questionnaire also asked the school canteens with the POP policy about whether these serving practice changes associated with the policy. 10 schools have responded that the development of food items has been enhanced in relation to the POP policy over the last five years.

5. Discussion

After the collected data is carefully analyzed by the sequence of WBQ, an integrated result is presented. It indicates that there are some associations between POP policy and healthy eating indicators. Therefore in this part, the results will be discussed based on the type of school, the POP schools and the non POP schools, in order to find out the relationship between organic food policies and indicators of healthy eating in a Danish

and Norwegian school food setting. Consequently we can conclude later on whether the POP schools are a "healthier" type of school compared with the non POP schools.

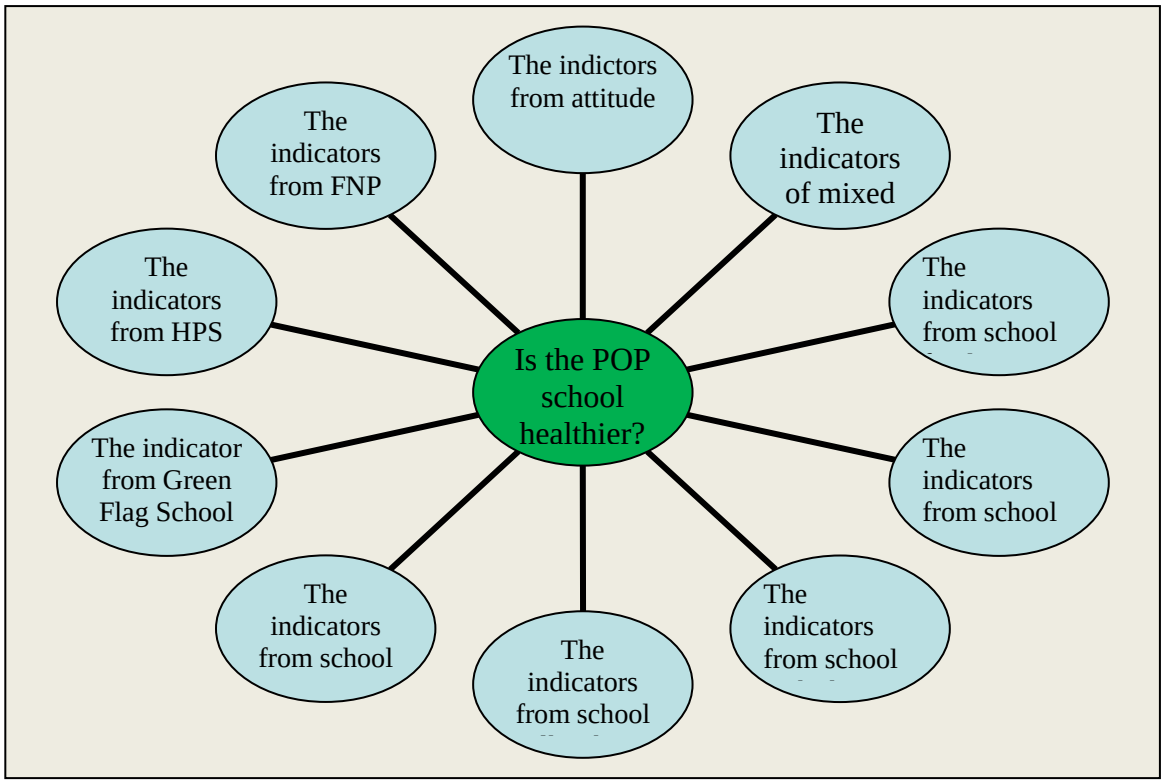

Figure 5.1 the analysis structure for discussion section, with different indicators of healthy eating for the POP school in relation to school foods.

The discussion section focuses on the important linkages of all results. The observed data is described in regard to the association between each other. The structure of the analysis for discussion is based on the complexity among the attitude of school respondents, existing policies and serving practices (see Figure 5.1). The discussion isn't going to be divided in the same order as the questionnaire, because the indicators of healthy eating are related across the sections. The respondent schools are mainly classified by the organic procurement policy, except the area concerned with food serving practices, due to different emphasis on food provision in Denmark and Norway.

As the previous results indicate, there were more schools with the FNP than the schools which have the POP policy. Here the study goes further to discover the distribution of the POP/non POP schools in relation to those which have the FNP (see Figure 5.2). In

Denmark, most of the POP schools have also adopted the FNP, the same goes with the Norwegian schools with organic foods. For the conventional schools, over half of the Danish schools have the FNP, but the chart shows that its distribution was much less compared with the POP schools. In Norway the case is on the contrary, most of the conventional schools don't have the FNP. You can see that the distribution of having both

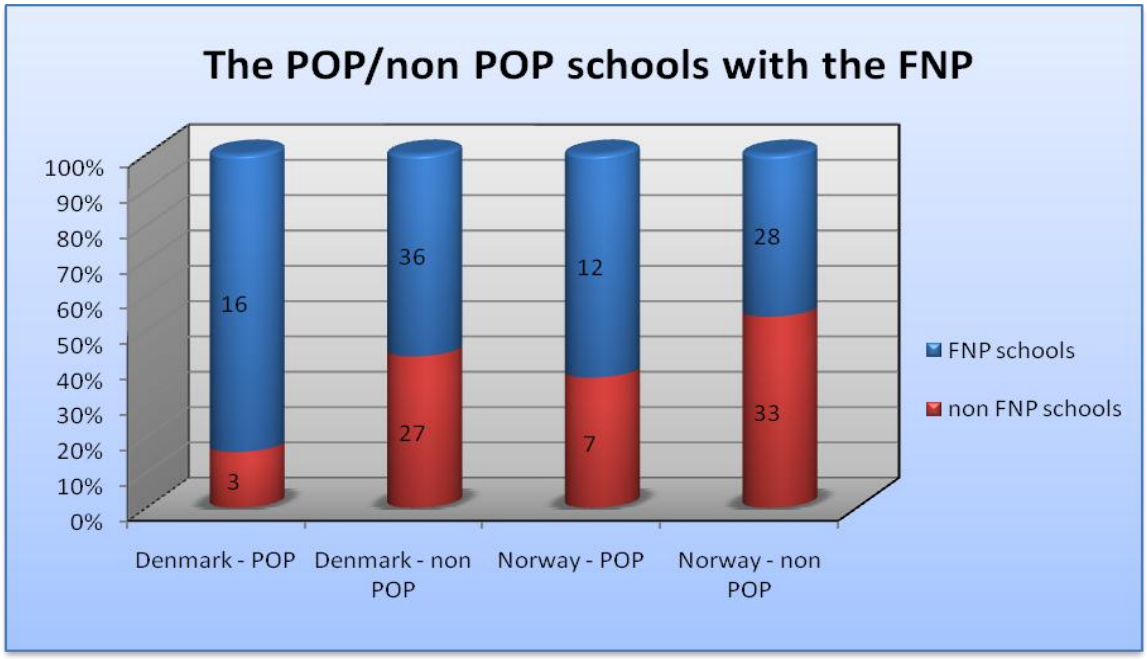

Figure 5.2 the number of POP/non POP schools with the FNP in Denmark and Norway.

policies in schools is larger, in other words, in both countries schools that supply organic foods are more likely to have a FNP than conventional schools.

Concerned with nutritional issues, the POP schools seem to work more in favor of it than non POP schools (see Figure 5.3). Over half of the POP schools have a nutrition team, canteen group or similar, and 41% of non POP schools have it. There were more POP schools where school food menus are nutritionally calculated on a regular basis than the non POP schools, although there wasn't a significant difference between them. The number of POP schools was almost equal on both issues. There were a higher amount of non POP schools focused on nutritional school food menus, than the schools which have a nutritional team. So we can conclude that the POP schools in two countries take a greater consideration for pupils regarding their school meals than non POP schools.

Additionally, even though the findings from the non POP schools are relatively negative, these schools are working on taking new steps.

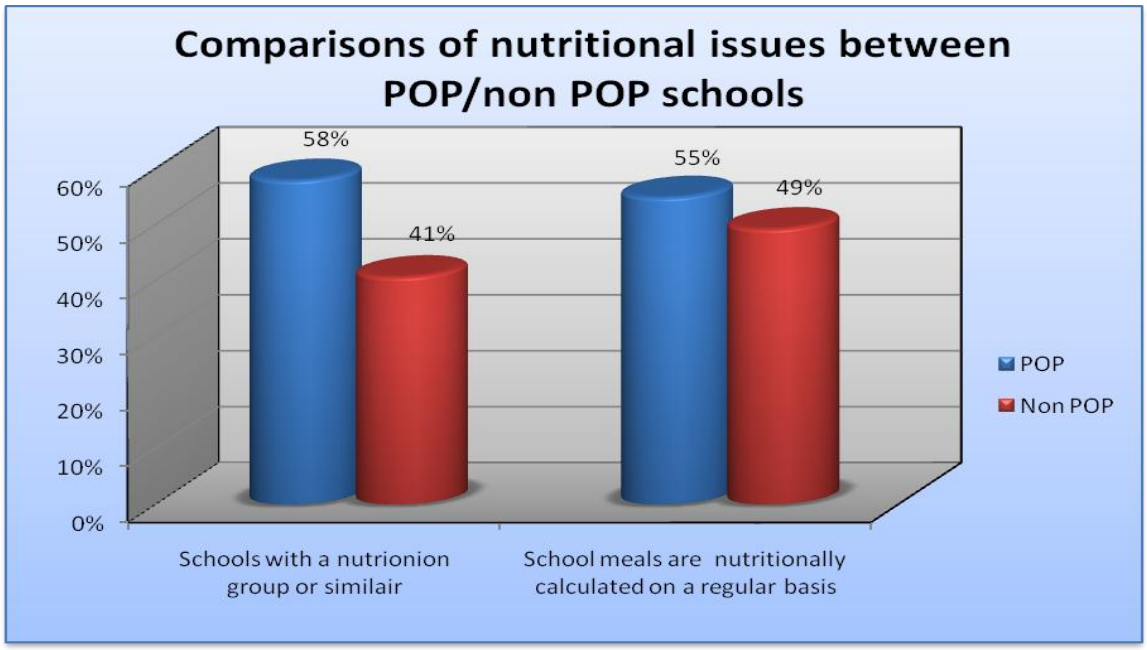

Figure 5.3 the comparison between POP schools and non POP schools with regard to the nutritional issues.

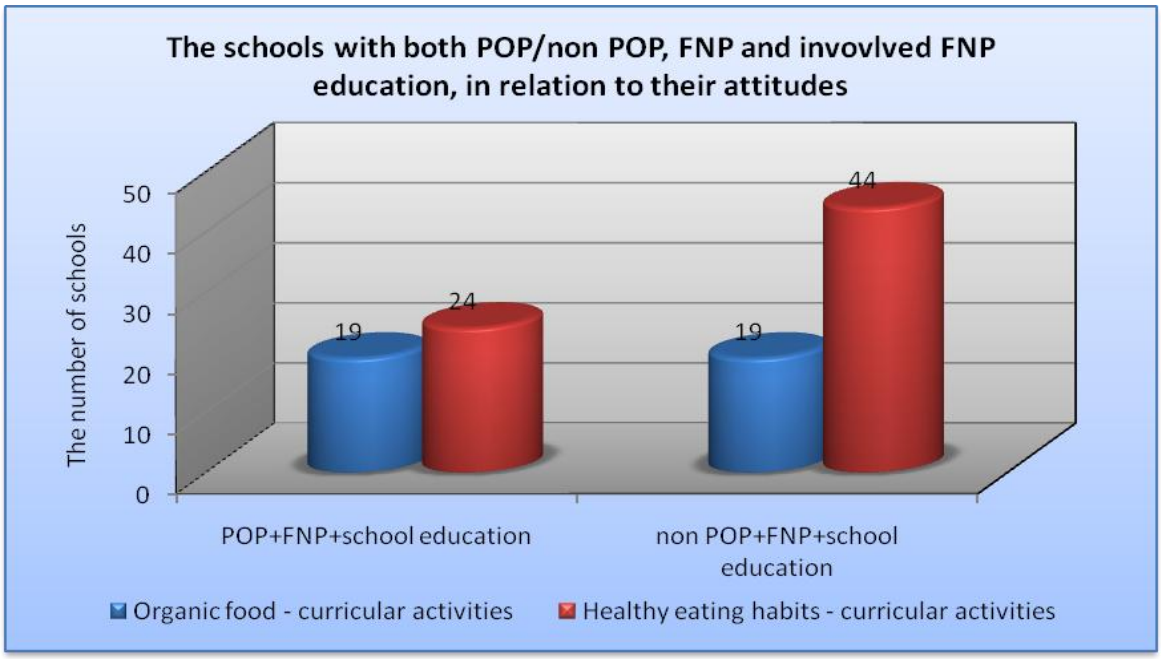

Figure 5.4 the schools with both POP policy, FNP and involved FNP education for pupils, in relation to their attitude about schools responsibilities for promote organic food and healthy eating habit through curricular activities.

The figure above tries to explain (see Figure 5.4) which schools have both POP/non POP policy and FNP. It also shows the relationship between the attitudes of school food coordinators toward promoting organic food and healthy eating habits through curricular activities, and school education on the FNP. There were 24 POP and 44 non POP schools that have responded. It's very obvious that both types of school respondents agree to promoting healthy eating habits among children by education, meanwhile teaching pupils FNP during class activities. A healthy diet might be one of the contents in the FNP for schools. 19 out of 24 POP schools answered that agree with promoting organic food through curricular activities, but only 19 of 44 non POP schools agree to it. Hence most of non POP schools pay less attention to organic food, even though they have nutritional education. Therefore, on the average, the POP schools pay more attention to organic food education than non POP schools. It's interesting that both schools are consistent on the attitude of promoting healthy eating habits through school education.

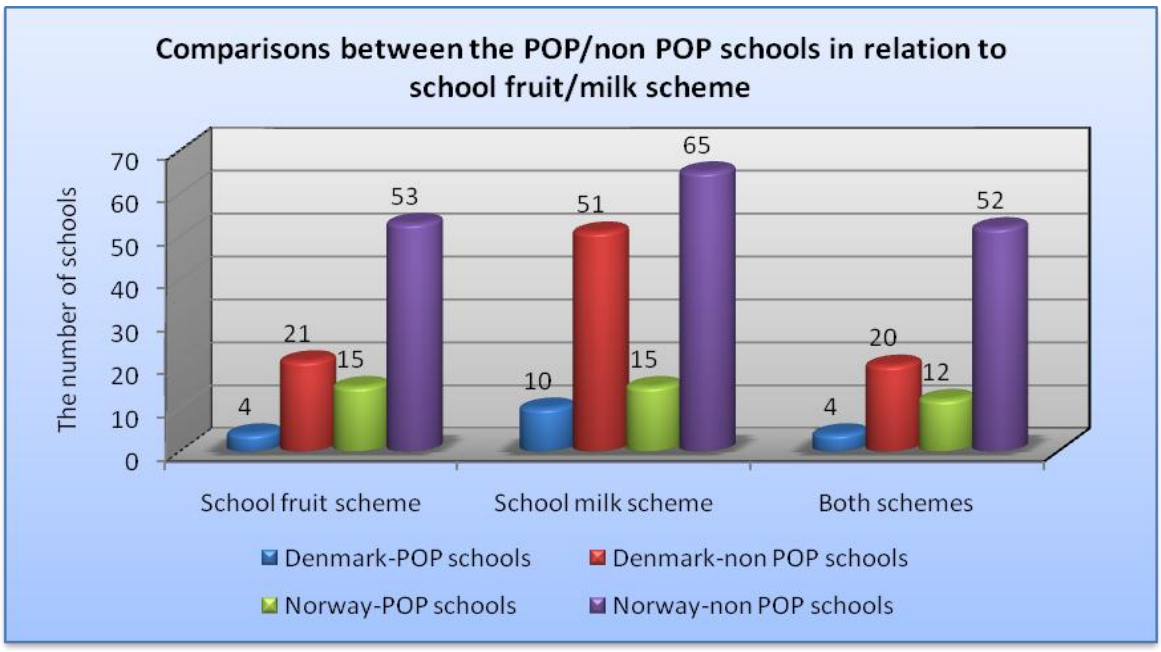

Figure 5.5 the comparisons between the POP/non POP schools in both countries regarding school fruit/milk scheme.

As table shows in the POP section of results (see Table 4.2.1.1), there were 20 Danish and 19 Norwegian schools which have the POP policy, and 63 Danish and 67 Norwegian schools which don't have the organic policy. As described before, both countries have the

fruit/milk scheme for children, it's therefore relevant to investigate the distribution of the POP/non POP schools related to these two schemes.

As the graph explores (see Figure 5.5), 20% of the Danish POP schools have the school fruit provision, just as 33% of the non POP schools. Apparently it can be seen that most of the Norwegian POP schools provide organic fruit for pupils, and most of the non POP schools supply students with conventional fruit. Data indicates also that there was a much higher percentage among the Norwegian POP schools which offer organic fruit than the Danish organic schools. This was the same with the conventional fruit scheme schools in both countries. This comparison of the school fruit scheme has a similar trend same to the school milk scheme. The difference is that there were more Danish/Norwegian POP schools providing organic milk than fruit. Nearly all of the conventional Norwegian schools give milk to pupils. The number of schools which have both schemes was relatively less. Only 20% of the Danish schools, but 63% of Norwegian POP schools have carried out both schemes in their school. Compare this with Norwegian conventional schools and you find that Danish schools have a much lower number of schools that offer fruit and milk at the same time.

On the whole, the Norwegian POP schools are moving faster than the Danes on both food provisions. But the POP schools in both countries develop slower than the non POP schools in relation to the school fruit/milk scheme. This is an exception in the research. This might be because organic school food hasn't been popularized in these countries, or the cost of organic foods are higher, or that the organic procurement policy is poorly adopted by schools or municipalities.

Besides, data shows in the sections of fruit and milk scheme (see Figure 4.3.1.2 and Figure 4.3.2.2), that there were 16 Danish and 50 Norwegian schools which more or less offers organic fruit to the children, 57 Danish schools and 19 Norwegian schools provide organic milk. Accordingly there are many schools which provide organic fruit or milk for pupils, even though they don't have the POP policy.

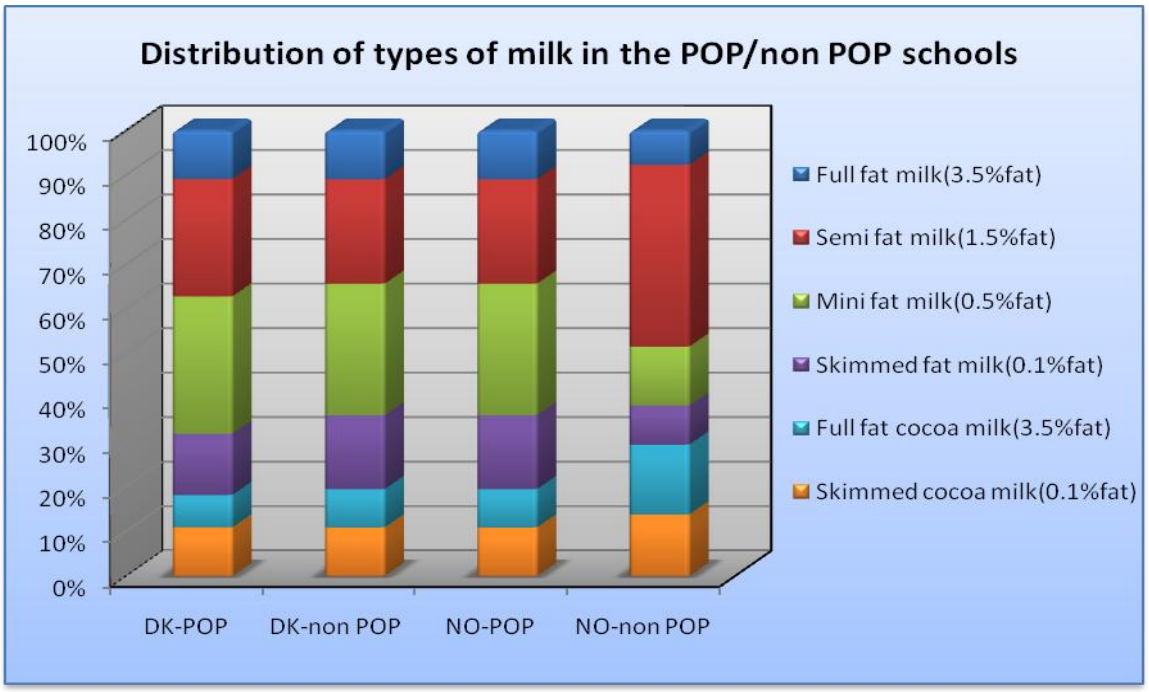

Figure 5.6 the distribution of different types of milk in the POP/non POP schools in both countries.

In the survey, 6 kinds of milk have been tested in two types schools. The bars above indicate the distribution of the milk in the POP and conventional schools in both countries (see Figure 5.6). In Denmark, organic semi fat milk (approx 1.5% fat) and mini fat milk (approx 0.5% fat) were mostly provided for pupils in the POP schools. Full fat milk (approx 3.5% fat) and full fat cocoa milk (approx 3.5% fat) were offered as well in a relatively lower amount. Skimmed fat milk (approx 0.1% fat) and skimmed fat cocoa milk (approx 0.1% fat) weren't provided much among the organic schools. In non POP schools, the situation was more or less the same. The only difference is that they offer a bit more skimmed milk and full fat cocoa milk and less semi fat milk than in the POP schools.

In Norway, the distribution of different kinds of milk in organic schools was almost the same as the conventional schools from Denmark. However, the conventional Norwegian schools supply much more semi fat and full fat cocoa milk than in the POP schools. It seems that conventional schools from Norway offer more cocoa milk to children, also, they offer less mini fat and skimmed milk in schools. From this overview it can be concluded that the organic schools offer lower fat and sugar content of milk than the

conventional schools. The same as previous section, the analysis was based on the average value of answers (see Appendix H).

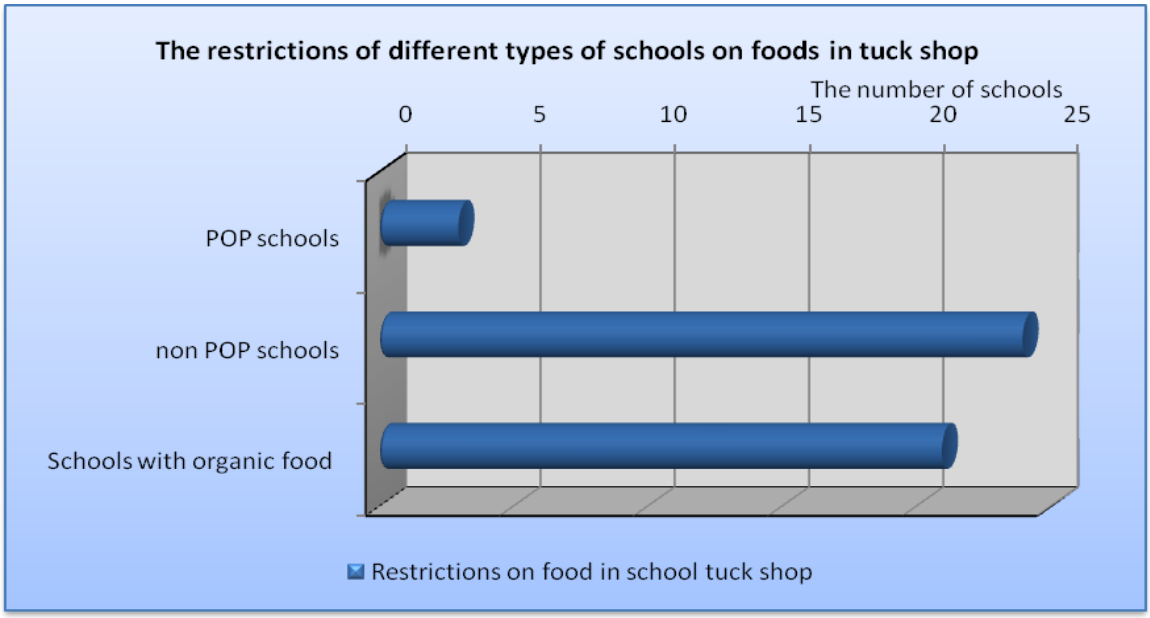

Figure 5.7 the number of different types of schools in relation to the restrictions on food items in school tuck shop.

The chart indicates (see Figure 5.7) that only 3 of 39 POP schools have restrictions on food items sold in the tuck shop, and 24 of 130 non POP schools have also set up regulations. From a percentage point of view, the 18% non POP schools were actually more likely to be strict with food sold in the tuck shop, compared to only 8% of the POP schools. Since there were only a few schools that have the organic policy, this comparison between the POP schools and non POP schools is meaningless. The result shows a lack of correlation. But there were only 5 out of 41 Danish schools with a tuck shop that has the POP policy, and apparently only 3 of them have made any restrictions.

As analyzed in the last section, 33 Danish schools have different levels of organic shares in food items in the tuck shop (see Figure 4.3.3.1), indicated as schools with organic food in the chart. In this section, 28 Danish schools have responded that they have restrictions, and 21 of schools contain certain amount of organic ingredient in school food. However, these schools haven't adopted the POP policy; otherwise it would be stronger evidence to prove the argument.

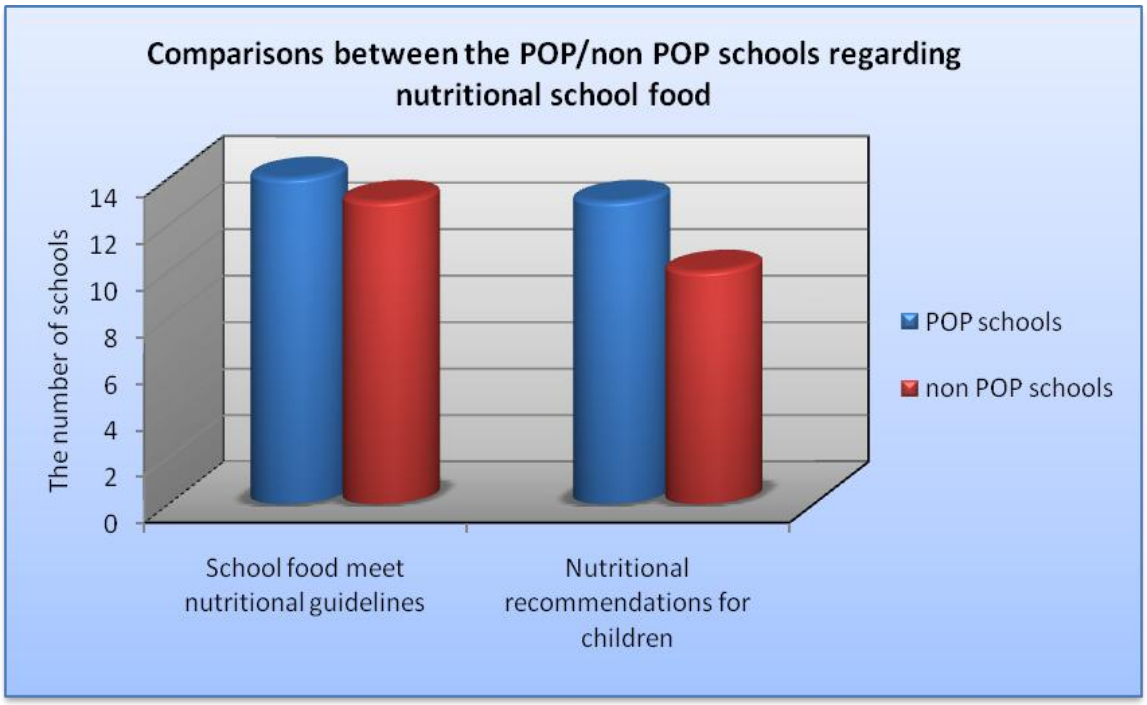

Figure 5.8 the comparisons between the POP/non POP schools in regard to the issues of nutritional school food and recommendations for pupils in Denmark and Norway.

The schools offering lunch is not enough, it's also necessary to find out if school food is nutritionally based. As comparisons show in the figure (see Figure 5.8), school meals in the organic schools were more likely to comply with the official nutritional guideline, in comparison to the conventional schools. The foods in school canteen are various, so food items chosen by pupils are very different. Sometimes children like to choose meals which they have tried before or have been cooked by parents at home, which possibly contain some unhealthy foods. Due to these reasons and others, nutritional recommendations on choosing food items for schools are helpful and advising.

The bars chart indicates that the POP schools recommend healthy meals for children more actively than the other schools. Combined with the analysis of the nutritional issues mentioned above (see Figure 5.3), it can be seen that the schools with the organic policy consider nutritional matters more for children than the conventional schools. POP policies in schools boost the nutritional concept in the pupils' mind through a collaboration of practice and education.

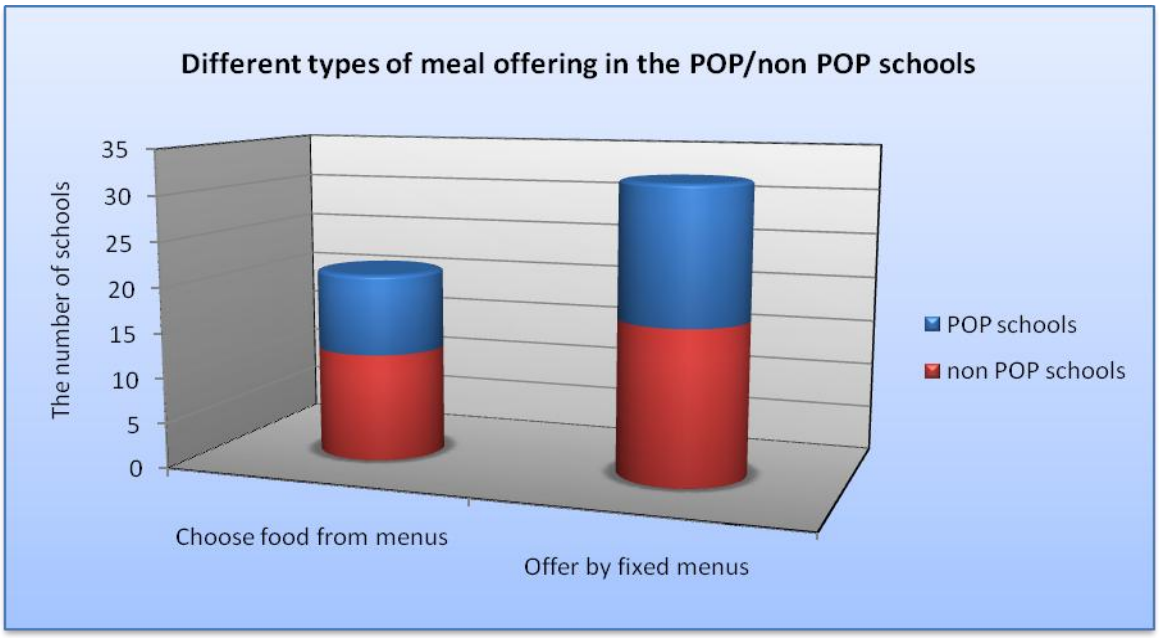

Figure 5.9 the ratio of types of meal-offering in the POP/non POP schools in both countries.

Two kinds of meal-offering are available in two types of schools (see Figure 5.9). The common situation is that in both POP and non POP schools, school meals were mostly offered by fixed menus. The number of both types of schools was also nearly the same. There were a few more conventional schools which provide selected menus. It's inappropriate to say that fixed menus aren't as good as the other choice. You don't see the foods, but selected food items are definitely supplied with diverse choices. Since many POP schools give nutritional recommendations to children, they should have more schools offer selected menus in canteens, so that pupils can put their knowledge into practice immediately. From the diagram it can be concluded that in both countries the schools with/without organic policy more adhere to fixed menus, the difference between them is very little.

The serving practices are probably the most direct way to find out the trend of food offered in schools. 13 food items were provided in both POP and non POP schools over the last five years. The values in the diagram (see Figure 5.10) show, that both types of schools served healthier food items and reduced the amount of less healthy foods. The same trend shows in the results section (see Figure 4.3.5.1).

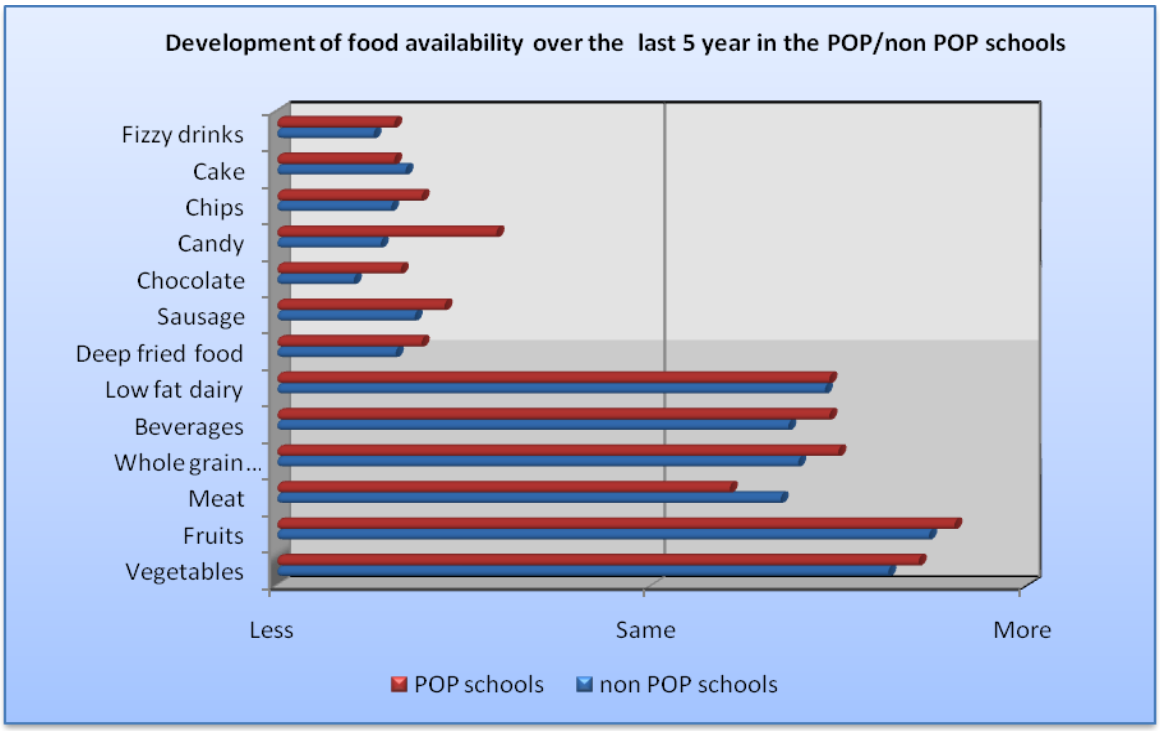

Figure 5.10 the comparisons between the POP/non POP schools on the development of food items over the last five years in Denmark and Norway.

Firstly, for healthier low-fat, cholesterol-free food options, the POP schools have increased more on most items than the conventional schools. Apart from meat, the non POP schools have promoted more than the organic schools and the two bars on the diagram were just about the same length for low fat dairy. Secondly, for the less healthy food items (except for cake), the organic schools were lower than the conventional schools, while the others were opposite. Moreover, candy items in POP schools were served much more than in the conventional schools in both countries. This outcome is only half of the anticipated result, because the organic procurement schools were expected to offer less high sugar/fat/calorie content food than conventional schools. It can therefore be explained that the POP schools have endeavored to promote healthier food to pupils over the last five years. Meanwhile, these schools didn't pay enough attention to reducing less healthy food like the non POP schools.

These results demonstrate that there is a positive relationship between serving practices for healthy eating and the organic procurement policies at schools. It shows the consumption of healthy food is proportional to the organic procurement policies.

Therefore, the POP schools seem to consider healthy issues more for children than the conventional schools. As above section, the analysis was based on the average value of answers (see Appendix I).

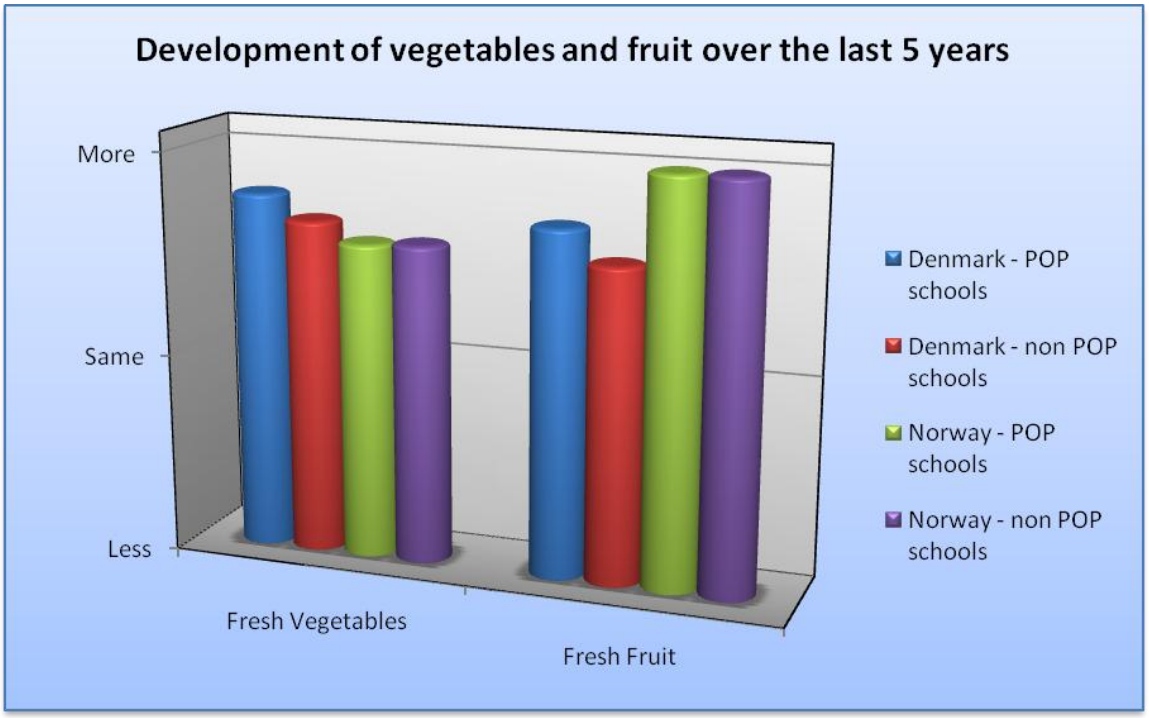

Figure 5.11 the changes in fruit and vegetable availability over the last 5 years in both countries.

Due to many Norwegian schools having the fruit scheme instead of a school tuck shop or canteen, it's relevant to further explore the tendencies of serving practices for vegetables and fruit in Danish and Norwegian schools. The diagram indicates (see Figure 5.11) that the availability of vegetables has increased in the organic schools in Denmark more than in conventional schools. The same was even more for fresh fruit. In Norway however, no differences were found. All of the schools have promoted eating of fresh vegetables and fruit for the last five years. Danish schools served more vegetables than Norwegian schools, and vice versa for fruit. Danish POP schools have been actively working on offering fresh vegetables for pupils, more than conventional and Norwegian schools. Even though there was no difference between Norwegian schools, they still have an increased amount of fruit compared to Denmark. Again, the analysis was based on the average value of answers (see Appendix I).

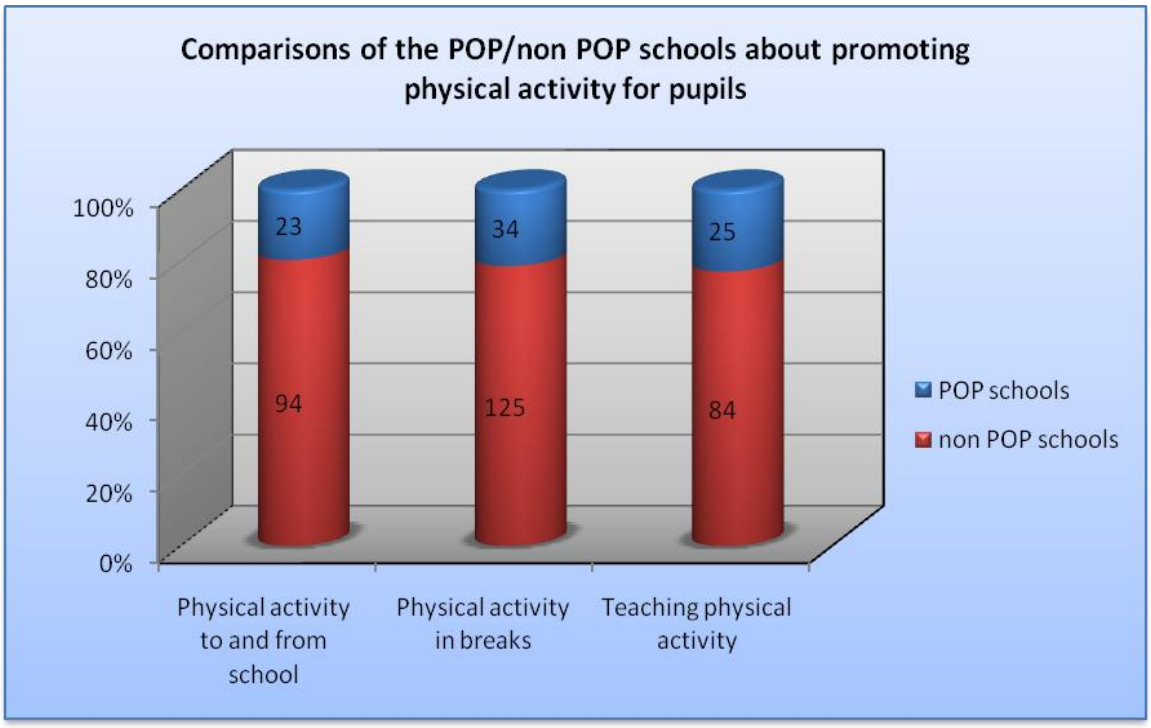

Figure 5.12 the comparisons between the POP/non POP schools related to promote physical activity and education for pupils.

It's also interesting to take a look at physical activity promotions in organic procurement policy schools, to see if any schools put organic issues on the agenda, as well as promoting physical activity through the school environment. The comparison is based on the percentage so that the results are fair. The diagram shows (see Figure 5.12) that there were around 59% POP and 72% conventional schools in both countries which encourage children to walk or bike to and from school. About 87% organic and 96% conventional schools have also promoted physical activities during breaks at schools. The percent of these two types of schools which also have physical activity education was nearly equal. It was exclusively conventional schools that promote physical activity harder among pupils than the POP schools, even though it has high percentage as well. The schools with the organic policy also teach pupils about physical education, and boost physical activities during breaks. These schools are working on both organic healthy food and the physical conditions of children. The POP schools promote outside school activities, but not as much as the non POP schools.

Based upon all the discussions and the indicators of healthy eating in Danish and Norwegian schools, there is a relation between having organic procurement policies and practices for improving the health and wellness of students at schools. It reveals that the schools with an organic procurement policy usually promote positively the nutritional side of school meals. Many schools don't have the policy yet, but subscribe for the organic food provision. It appears that the issues of health and organic food are moving in the same direction, in other words, it might be an ideal way to combine both agendas in order to create a healthy school. However, a few aspects also show that, the POP schools haven't moved forward as well as expected.

6. Conclusion

Even though organic food hasn't become popular in Danish and Norwegian schools, it's true that some municipalities/schools in both countries have already taken it as priority for promoting healthy eating habits among the pupils. The study uncovers that school food coordinators from POP schools think that the school should take more responsibilities regarding children's health. The schools involved in an organic procurement approach to promote the well-being of pupils, have mostly adopted the food and nutritional policy also. Some organic schools have included additional policies concerned with reducing the onset of weight-related health issues. Serving practices in different food provisions have been promoted more significantly in the POP schools compared with conventional schools, and a percentage of schools attributed the improvement on account of the POP policy. It also brings to light that children in schools with the organic procurement policy have been eating healthier than in the conventional schools. The results indicate that POP schools are more likely to develop a comprehensive concept of nutritional issues for their pupils. Therefore, we can conclude that organic food intervention in schools can gradually build a healthy eating pattern among pupils.

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Appendix A

Web based questionnaire – English version

1. Personal information

(In order to facilitate contact with the winner of lotto, we need to ask you to fill in some personal information. This information will treat with strict confidence and won't be given to any third party.)

1.1 First name _____

1.2 Last name _____

1.3 E-mail address _____

1.4 Phone number _____

1.5 Which country are you from?

Denmark ☐

Norway ☐

Germany ☐

1.6 What is your current position at school? (Only one option)

School headmaster or similar ☐

School food coordinator (administration responsibility) ☐

School kitchen manager ☐

External school food caterer ☐

School kitchen operator ☐

Other ☐

1.7 If you answer "other" in the above question, please specify here._____

2. School information

2.1 School name _____

2.2 Address _____

2.3 Number of pupils

<100 ☐

100-200 ☐

>200 ☐

2.4 Number of grades

1-7 ☐

1-9 ☐

1-10 ☐

8-10 ☐

3. Questions about your opinion/attitude

3.2 I think that the school has a responsibility in promoting organic foods through its food service.

Agree very much ☐

Partly agree ☐

Disagree ☐

Don't know ☐

3.3 I think that the school has a responsibility in promoting organic food through its curricular activities.

Agree very much ☐

Partly agree ☐

Disagree ☐

Don't know ☐

3.4 I think that the school has a responsibility in promoting healthy eating habits through its food service.

Agree very much ☐

Partly agree ☐

Disagree ☐

Don't know ☐

3.5 I think that school has a responsibility in promoting healthy eating habits through its curricular activities.

Agree very much ☐

Partly agree ☐

Disagree ☐

Don't know ☐

4. Your praxis regarding organic foods

(Public Organic Food Procurement Policy (POP) refer to a policy in which a specified amount of specified foods are expected to be organic, which are practiced in public organizations offering food.)

4.1 Do your school have a public organic food procurement policy?

Yes ☐

No ☐

Don't know ☐

4.2 If yes, please fill the number of years which this public organic food procurement policy has been there.

<1 ☐

2 ☐

3 ☐

4 ☐

>5 ☐

4.3 Which institution has adopted public organic food procurement policy in your case?

National government ☐

Local or regional government ☐

School administration ☐

Other ☐

4.4 If answer 'other' in the above question, please specify here._____

4.5 Is this public organic food procurement policy a compulsory program or voluntary program?

Compulsory ☐

Voluntary ☐

4.7 Does the school have any monitoring steps or evaluation parameters for this public organic food procurement policy in order to follow up the application of organic food?

Yes ☐

No ☐

Don't know ☐

4.8 If answer 'yes' in the above question, please specify here.

Based on the evaluation from outside officials ☐

Based on the inspection of school administration ☐

Based on the kitchens' auto control ☐

Other ☐

4.9 If answer 'other' in the above question, please specify here._____

5. Your policies in relation to food, health & nutrition

(Food & Nutrition Policy (FNP) is a set of written and adopted principles that aims to fulfill nutritional needs of pupils at schools and ensure availability and accessibility of healthy foods.)

5.1 Do your school have a food & nutrition policy for the pupils?

Yes ☐

No ☐

Don't know ☐

5.2 If yes, please fill the number of years which this food & nutrition policy has been there.

<1 ☐

2 ☐

3 ☐

4 ☐

>5 ☐

5.3 Which institution has adopted this food & nutrition in your case?

National government ☐

Local or regional government ☐

School administration ☐

Other ☐

5.4 If answer 'other' in the above question, please specify here._____

5.5 Does this food & nutrition include in teaching activities in the school?

Yes ☐

No ☐

Don't know ☐

5.6 Is this food & nutrition policy has any content concern about organic food?

Yes ☐

No ☐

Don't know ☐

5.7 Do your school have a nutrition group or canteen group or similar?

Yes ☐

No ☐

Don't know ☐

5.8 Are school food/menus nutritionally calculated on a regular basis, if your school has school food?

Yes ☐

No ☐

Don't know ☐

Don't have school food ☐

6. Your policies in relation to general school health issues

(A health promoting school is one that constantly strengthens its capacity as a healthy setting for living, learning and working. *World Heath Organisation (WHO)*

6.1 Are your school an health promoting school according to World Heath Organisation (WHO) principle?

Yes ☐

No ☐

Don't know ☐

6.2 If yes, please fill the number of years which the school have this policy.

<1 ☐

2 ☐

3 ☐

4 ☐

>5 ☐

6.3 Do your school have your own health promoting policy?

Yes ☐

No ☐

Don't know ☐

6.3 Do your school promote bicycle/walk/other physical transport activities for pupils?

Yes ☐

No ☐

Don't know ☐

6.4 Do your school have a playground?

Yes ☐

No ☐

Don't know ☐

6.5 Do your school promote physical activity in breaks?

Yes ☐

No ☐

Don't know ☐

6.6 Do your school have physical activity as a prioritized theme in curriculum activities except gym courses?

Yes ☐

No ☐

Don't know ☐

7. <u>Green flag school</u>

(Definition of green flag school: Schools across the nation are using the Green Flag School Program to make their schools healthier places to work and learn. http://www.greenflagschools.org/Intro.htm)

7.1 Are your school joining green flag school program?

Yes ☐

No ☐

Don't know ☐

7.2 If yes, please fill the number of years which the school has been participating.

<1 ☐

2 ☐

3 ☐

4 ☐

>5 ☐

8. School food provision type

8.1 What is your school food serving practice?

School fruit scheme ☐ *(please go to section 9)*

School milk scheme ☐ *(please go to section 10)*

School tuck shop ☐ *(please go to section 11)*

School canteen ☐ *(please go to section 12, 13)*

9. Serving practice I -School fruit

9.1 Please estimate the percentage of organic fruit share.

<25 ☐

25-50 ☐

50-75 ☐

>75 ☐

9.2 Do your school give fruit out in class every school day?

Yes, free ☐

Yes, with paying ☐

No, we don't have ☐

10. Serving practice II-School milk

10.1 Please estimate the percentage of organic milk share.

<25 ☐

25-50 ☐

50-75 ☐

>75 ☐

10.2 Please estimate the amount of full fat milk (approx 3.5% fat)

0-20% ☐

20-40% ☐

40-60% ☐

60-80% ☐

80-100% ☐

Don't have ☐

10.3 Please estimate the amount of semi fat milk (approx 1.5% fat)

0-20% ☐

20-40% ☐

40-60% ☐

60-80% ☐

80-100% ☐

Don't have ☐

10.4 Please estimate the amount of mini fat milk (approx 0.5% fat)

0-20% ☐

20-40% ☐

40-60% ☐

60-80% ☐

80-100% ☐

Don't have ☐

10.5 Please estimate the amount of low fat/skimmed milk (approx 0.1%)

0-20% ☐

20-40% ☐

40-60% ☐

60-80% ☐

80-100% ☐

Don't have ☐

10.6 Please estimate the amount of full fat cocoa milk (approx 3.5% fat)

0-20% ☐

20-40% ☐

40-60% ☐

60-80% ☐

80-100% ☐

Don't have ☐

10.7 Please estimate the amount of low fat/skimmed cocoa milk (approx 0.1%)

0-20% ☐

20-40% ☐

40-60% ☐

60-80% ☐

80-100% ☐

Don't have ☐

10.8 Do your school give milk out in class every school day?

Yes, free ☐

Yes, with paying ☐

No, we don't have. ☐

11. Serving practice III-School tuck shop

11.1 Do your school offer warm/cold meals to the pupils in the tuck shop?

Yes ☐

No ☐

11.2 If yes, how is your school warm/cold meal prepared?

Tuck shop at school site ☐

Tuck shop contracted at downtown site ☐

11.3 Please estimate the percentage of organic foods share.

<25 ☐

25-50 ☐

50-75 ☐

>75 ☐

11.4 What type of meals do you offer? (More ticks allowed)

Sandwich ☐

Cold dish (Sushi box, Burger box, Pasta box, Salad box, e☐.)

Reheated meals (Rice, meat sauce, etc) ☐

11.5 How long time the lunch break takes at school?

>15mins ☐

20min ☐

25mins ☐

>30mins ☐

11.6 Do your school have restrictions on the type of snack foods in the school tuck shop?

Yes ☐

No ☐

11.7 What food items are offered in the shop? (More ticks allowed)

Fizzy drinks ☐

Chocolate ☐

Sweets ☐

Chips ☐

11.8 Do your school have a competitive food outlet outside but nearby the school (shorter than 250 meters), e.g. a kiosk, gasoline station etc?

Yes ☐

No ☐

11.9 Do your school have restrictions, for pupils who are allowed to leave the school, for their access to competitive food outlets outside the school?

Yes ☐

No ☐

12. Serving practice IV- canteen/cafeteria (with the facilities that can sit down)

12.1 How is your school meal prepared?

Kitchen at school site ☐

Central kitchen at downtown site ☐

12.2 Please estimate the percentage of organic foods share.

<25 ☐

25-50 ☐

50-75 ☐

>75 ☐

12.3 Do your school meal service have to comply with official nutritional guidelines?

Yes ☐

No ☐

Don't know ☐

12.4 Are menus designed base on the demand of pupils in the school?

Yes ☐

NO ☐

Don't know ☐

12.5 Which kind of meal-offering do your school have? (More ticks allowed)

Pupils can choose food from menu ☐

Pupils are offered by fixed menu ☐

12.6 Do your school have a recommendatory nutritional menu for pupils in front of canteen?

Yes ☐

No ☐

12.7 How long time the lunch break takes at school?

>15mins ☐

20min ☐

25mins ☐

>30mins ☐

12.10 Do your school have a competitive food outlet outside but nearby the school (shorter than 250 meters), e.g. 7/11 shop, gasoline station etc?

Yes ☐

No ☐

12.11 Do your school have restrictions, for pupils who are allowed to leave the school, for their access to competitive food outlets outside the school?

Yes ☐

No ☐

13. Serving practice IV-only validate for section 11 and 12

(Please specify in which direction your serving practices have changed in relation to availability of following items over the past 5 years.)

13.1 Fresh Vegetables (e.g. Lettuce, Cucumbers, Carrots, Tomatoes Green beans etc)

More ☐

Same ☐

Less ☐

Don't know ☐

13.2 Fresh Fruit (e.g. Apples, Pears, Peaches, Oranges, Grapefruit etc)

More ☐

Same ☐

Less ☐

Don't know ☐

13.3 Meats (e.g. Chicken, Pork chops, Steaks, Fish, Lean hamburger etc)

More ☐

Same ☐

Less ☐

Don't know ☐

13.4 Whole grain products (e.g. Whole grain bread, Whole grain pasta, Whole grain cereal, Oatmeal etc)

More ☐

Same ☐

Less ☐

Don't know ☐

13.5 Beverages (e.g. free cold drinking water, 100% Fruit juice, Tomato juice, Herb tea etc)

More ☐

Same ☐

Less ☐

Don't know ☐

13.6 Low fat dairy (e.g. Low fat milk, Low fat yoghurt, Low fat sour cream, Low fat cream cheese etc)

More ☐

Same ☐

Less ☐

Don't know ☐

13.7 Deep fried food (Pommes fries, Chicken nuggets, Fish fingers, Hamburgers, etc)

More ☐

Same ☐

Less ☐

Don't know ☐

13.8 Sausages

More ☐

Same ☐

Less ☐

Don't know ☐

13.9 Chocolate / Chocolate Bars

More ☐

Same ☐

Less ☐

Don't know ☐

13.10 Candy

More ☐

Same ☐

Less ☐

Don't know ☐

13.11 Chips

More ☐

Same ☐

Less ☐

Don't know ☐

13.12 Cake

More ☐

Same ☐

Less ☐

Don't know ☐

13.13 Fizzy drinks

More ☐

Same ☐

Less ☐

Don't know ☐

13.14 If your serving practices have changed, please give an account of the reason. (More ticks allowed)

In order to cut expenses ☐

In order to meet nutritional guidelines ☐

To meet user demand ☐

Other ☐

13.15 If you answered other in the above question, please specify here. _____

13.16 Are these changes to your option associated with your POP?

Yes ☐

No ☐

Don't know ☐

14. Comments and feedback

Do you have any comments or questions to this questionnaire or iPOPY?

_____

Appendix B

Web based questionnaire – Danish/Internet version

Spørgeskema om fødevarer i skolen

Formålet med denne undersøgelse er, at frembringe viden omkring sammenhænge mellem sunde kost vaner hos unge og adgangen til økologiske fødevarer samt politiker om disse i folkeskolen/grundskolen.

For at frembringe så dyb viden som mulig, er målgruppen for undersøgelsen også omfattet af skoler som ikke har økologiske fødevarer.

Din besvarelse har stor værdi for os!

DTU Fødevareinstituttet er ansvarlige for denne undersøgelse.

Personlige oplysninger
Blandt svarene trækker vi lod om en præmie. Derfor beder vi om nogle personlige oplysninger. Disse oplysninger vil blive behandlet strengt fortroligt og vil ikke blive vidregivet til andre.

Personlige oplysninger

Fornavn _____

Efternavn _____

E-mail adresse _____

Telefon nummer _____

Hvilket land kommer du fra?

(1) ❑ Danmark

(2) ❑ Norge

Hvad er din nuværende stilling på skolen?

(1) ❑ Skole leder el. lign.

(2) ❑ Skolemadskoordinator (Administrativt ansvar)

(3) ❑ Skolekantine leder (driftansvarlig)

(4) ❑ Ekstern skolemadsleverandør

(5) ❑ Skolekøkken personale

(6) ❑ Andet _____

Oplysninger om skolen
Dette afsnit omfatter grundoplysninger om skolen.

Skolens adresse

Navn _____

Adresse _____

Postnummer _____

By _____

Kommune nummer _____

Antal elever på skolen

(1) ❑ <100

(2) ❑ 100-200

(3) ❑ >200

Klassetrin på skolen

(1) ❑ 7

(2) ❑ 9

(3) ❑ 10

(4) ❑ 8-10

Holdningsspørgsmål
De følgende spørgsmål fokuserer på holdinger omkring skolemad.

Begrebet 'mad servering' referer til mad som er serveret/solgt på skolen.

Jeg mener skolen har et ansvar for at fremme <u>økologiske fødevarer</u> gennem <u>skolens mad servering</u>

(1) ❑ Meget enig

(2) ❑ Delvis uenig

(3) ❑ Uenig

(4) ❑ Ved ikke

Jeg mener skolen har et ansvar for at fremme <u>økologiske fødevarer</u> gennem <u>undervisningen</u>

(1) ❑ Meget enig

(2) ❑ Delvis uenig

(3) ❑ Uenig

(4) ❑ Ved ikke

Jeg mener skolen har et ansvar for at fremme <u>sunde kostvaner</u> gennem <u>skolen mad servering</u>

(1) ❑ Meget enig

(2) ❑ Delvis uenig

(3) ❑ Uenig

(4) ❑ Ved ikke

Jeg mener skolen har et ansvar for at fremme <u>sunde kostvaner</u> gennem <u>undervisningen</u>

(1) ❑ Meget enig

(2) ❑ Delvis uenig

(3) ❑ Uenig

(4) ❑ Ved ikke

Skolens praksis vedrørende økologiske fødevarer
De følgende spørgsmål omhandler den nuværende praksis i skolen relateret til økologiske fødevarer.

Følgende begreb er relevant i denne sammenhæng:
Public Organic Food Procurement Policy (POP), refererer til en politik der skal fremme brugen af økologiske fødevarer og som praktiseres hos offentlige organisationer hvor der serveres mad.

Bemærk: *Ordet 'politik' dækker også over retningslinier eller regler.*

Er der en politik vedrørende indkøb af økologiske fødevarer på din skole?

(1) ❑ Ja

(2) ❑ Nej

(3) ❑ Ved ikke

Hvor mange år har skolen haft denne politik?

(1) ❑ under 1 år

(2) ❑ 2 år

(3) ❑ 3 år

(4) ❑ 4 år

(5) ❑ Mere end 5 år

Hvilken myndighed mener du har været afgørende for indførelsen af denne politik på skolen?

(1) ❑ Staten

(2) ❑ Kommune eller amt (region)

(3) ❑ Skoleadministrationen

(4) ❑ Andet _____

Er det valgfrit at følge denne politik?

(1) ❑ Ja

(2) ❑ Nej

Har skolen nogen kontrolmetoder eller evalueringsparametre for politiken, så anvendelsen af økologiske fødevarer kan følges?

(1) ❑ Ja

(2) ❑ Nej

(3) ❑ Ved ikke

Hvordan følges der op på anvendelsen af økologiske fødevarer?

(1) ❑ Baseret på evaluering fra ekstern myndighed

(2) ❑ Baseret på inspektion fra skoleadministrationen

(3) ❑ Baseret på køkkenet egenkontrol

(4) ❑ Andet _____

Skolens politik vedrørende mad, sundhed og ernæring
Følgende spørgsmål omhandler skolens retningsliner i forbindelse med sundhed og ernæring.

Følgende begreb er relevant i denne sammenhæng:
Food & Nutrition Policy (FNP) refererer til et sæt skriftlige og indarbejdede regler, som forsøger at opfylde elevernes ernæringsmæssige behov og sikrer adgang til sunde fødevarer.

Bemærk: *Ordet 'politik' dækker også over retningslinier.*

Er der en fødevare og ernæringspolitik for eleverne på skolen?

(1) ❑ Ja

(2) ❑ Nej

(3) ❑ Ved ikke

Hvor mange år har skolen haft denne politik?

(1) ❑ under 1 år

(2) ❑ 2 år

(3) ❑ 3 år

(4) ❑ 4 år

(5) ❑ Mere end 5 år

Hvilken myndighed mener du har været afgørende for indførelsen af denne politik på skolen?

(1) ❑ Staten

(2) ❑ Kommune eller amt (region)

(3) ❑ Skoleadministrationen

(4) ❑ Andet _____

Omfatter denne politik de pædagogiske aktiviteter?

(1) ❑ Ja

(2) ❑ Nej

(3) ❑ Ved ikke

Omfatter denne politik økologi?

(1) ❑ Ja

(2) ❑ Nej

(3) ❑ Ved ikke

Er der en ernæringsgrupper, kantine udvalg eller lignende på skolen?

(1) ❑ Ja

(2) ❑ Nej

(3) ❑ Ved ikke

Hvis skolen har skolemad, er skolemaden da regelmæssigt ernæringsberegnet?

(1) ❑ Ja

(2) ❑ Nej

(3) ❑ Ved ikke

(4) ❑ Skolen har ikke skolemad

Skolens politik vedrørende generelle sundhedsanliggender
Følgende begreb er relevant i denne sammenhæng:
En sundhedsfremmende skole i WHO forstand, refererer til en skole der løbende forsøger at fremme en sund levevis for både elever og lærer.

Er skolen en sundhedsfremmende skole i WHO forstand?

(1) ❑ Ja

(2) ❑ Nej

(3) ❑ Ved ikke

Har skolen sin egen sundhedsfremmende politik?

(1) ❑ Ja

(2) ❑ Nej

(3) ❑ Ved ikke

Hvor mange år har skolen haft denne politik?

(1) ❑ under 1 år

(2) ❑ 2 år

(3) ❑ 3 år

(4) ❑ 4 år

(5) ❑ Mere end 5 år

Støtter skolen eleverne i cykling eller til skolen?

(1) ❑ Ja

(2) ❑ Nej

(3) ❑ Ved ikke

Har skolen en legeplads?

(1) ❑ Ja

(2) ❑ Nej

(3) ❑ Ved ikke

Opmuntrer skolen til fysisk aktivitet i frikvarterene?

(1) ❑ Ja

(2) ❑ Nej

(3) ❑ Ved ikke

Er fysisk aktivitet en fast del af undervisningen ud over gymnastikundervisning/idrætstimerne?

(1) ❑ Ja

(2) ❑ Nej

(3) ❑ Ved ikke

Grøn flag skole
Følgende spørgsmål omhander begrebet 'Grøn Flag Skole'.

En grøn flag skole er skoler overalt i landet og udlandet som benytter Det Grønne Flag skoleprogram til at skabe et sundt arbejds- og undervisningsmiljø.

For mere information se www.greenflagschool.org

Deltager skolen i Det Grønne Flag skoleprogrammet?

(1) ❑ Ja

(2) ❑ Nej

(3) ❑ Ved ikke

Hvor mange år har skolen deltaget?

(1) ❑ under 1 år

(2) ❑ 2 år

(3) ❑ 3 år

(4) ❑ 4 år

(5) ❑ Mere end 5 år

Skolen forsynings af fødevare
De næste spørgsmål er delt ind i 4 afsnit. Baseret på svaret nedestående spørgsmål, vi der blive vist et seperat afsnit af spørgsmål for hvert svarmulighed der vælges.
Hvert afsnit er tilpasset den valgte forsyningskilde.

Hvilket af følgende koncepter benytter skolen?

(1) ❑ Frugtbod/skolefrugt

(2) ❑ Skolemælk

(3) ❑ Skolebod (uden faciliteter til at sidde ned).

(4) ❑ Kantine (med faciliteter til at sidde ned og med eget køkken)

Frugtbod Dette afsnit omhander spørgsmål vedrørende jeres frugtbod.

Tilbyder skolen frugt?

(1) ❑ Ja, gratis

(2) ❑ Kun mod betaling

(3) ❑ Nej

Hvor mange procent udgør andelen af økologisk frugt?

(0) ❑ 0 %

(1) ❑ under 25 %

(2) ❑ 25 - 50 %

(3) ❑ 50 - 75 %

(4) ❑ over 75 %

Skolemælk Det næste afsnit omhander spørgsmål vedrørende skolemælk.

Tilbyden skolen mælk hver dag?

(1) ❑ Ja, gratis

(2) ❑ Kun mod betaling

(3) ❑ Nej

Anslå hvor stor en procentandel udgør økologisk mælk af den samlede mængde mælk

(0) ❑ 0 %

(1) ❑ under 25 %

(2) ❑ 25 - 50 %

(3) ❑ 50 - 75 %

(4) ❑ over 75 %

Anslå skønsmæssigt den procentuelle fordelingen af mælktyper.

	0 - 20 %	20 - 40 %	40 - 60 %	60 - 80 %	80 - 100 %	Har ikke
Andelen af sødmælk (ca. 3,5% fedt)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Andelen af letmælk (ca. 1,5% fedt)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Andelen af minimælk (ca. 0,5% fedt)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Andlen af skummetmælk (ca. 0,1% fedt)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Andelen af kakaomælk (ca. 3,5% fedt)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Andelen af kakaoskummetmælk (ca. 0,1% fedt)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Skolebod Det næste afsnit omhander spørgsmål vedrørende skoleboden.

Bemærk: For at være en skolebod og ikke en egentlig kantine, må der ikke være

faciliteter til at sidde ned eller køkken.

Hvor er maden tilberedt?

(1) ❑ På skolen

(2) ❑ Uden for skolen

Hvor stor en skønsmæssig procentandel udgør økologiske fødevarer?

(0) ❑ 0 %

(1) ❑ under 25 %

(2) ❑ 25 - 50 %

(3) ❑ 50 - 75 %

(4) ❑ over 75 %

Hvilke typer mad tilbydes der?

(1) ❑ Sandwich

(2) ❑ Kolde tallerken anretninger (f.eks. sushi, burger, pasta, salat)

(3) ❑ Genopvarmede retter (f.eks. ris, kødsauce)

(4) ❑ Kage

Hvor lang tid varer spisepausen på skolen?

(1) ❑ 15 minutter

(2) ❑ 20 minutter

(3) ❑ 25 minutter

(4) ❑ over 30 minutter

Har skolen restriktioner på typen af måltider/produkter der sælges fra skoleboden?

(1) ❑ Ja

(2) ❑ Nej

Hvilke øvrige fødevarer tilbydes der i skoleboden?

(1) ❑ Sodavand

(2) ❑ Chokolade

(3) ❑ Slik

(4) ❑ Chips

Findes der en konkurrerende butik med salg af fødevarer i nærheden af skolen, f.eks. en kiosk, en tank e.l. (under 250 meter)?

(1) ❑ Ja

(2) ❑ Nej

Begrænser skolen, for de elever der må forlade skolens område, elevernes adgang til konkurrerende fødevarerbutikker uden for skolen?

(1) ❑ Ja

(2) ❑ Nej

Kantine/cafeteria Det næste afsnit omhander spørgsmål vedrørende skolen kantine eller cafeteria.

Bemærk: For at være en egentlig kantine eller cafeteria, skal der være facilitere til at side ned.

Hvor er maden tilberedt?

(1) ❑ På skolen

(2) ❑ I et køkken uden for skolen

Hvor stor en skønsmæssig procentandel udgør økologiske fødevarer?

(0) ❑ 0 %

(1) ❑ under 25 %

(2) ❑ 25 - 50 %

(3) ❑ 50 - 75 %

(4) ❑ over 75 %

Overholder udbudet de officielle ernæringsanbefalinger?

(1) ❑ Ja

(2) ❑ Nej

(3) ❑ Ved ikke

Er menuerne sammensat ud fra elevernes efterspørgsel?

(1) ❑ Ja

(2) ❑ Nej

(3) ❑ Ved ikke

Hvilken serveringstype udbydes der på skolen?

(1) ❑ Eleverne vælger ud fra et menu kort

(2) ❑ Eleverne tilbydes en fast menu

Giver skolen en ernæringsmæssig anbefaling til eleverne om hvad de bør vælge?

(1) ❑ Ja

(2) ❑ Nej

Hvor lang tid varer spisepausen på skolen?

(1) ❑ 15 minutter

(2) ❑ 20 minutter

(3) ❑ 25 minutter

(4) ❑ over 30 minutter

Findes der en konkurrerende butik med salg af fødevarer i nærheden af skolen, f.eks. en kiosk, en tank e.l. (under 250 meter)?

(1) ❑ Ja

(2) ❑ Nej

Begrænser skolen, for de elever der må forlade skolens område, elevernes adgang til konkurrerende fødevarerbutikker uden for skolen?

(1) ❑ Ja

(2) ❑ Nej

Angiv i hvilken retning skolens udbud af fødevarer har ændret sig i forhold til tilgængelighed igennem de sidste 5 år

	Mere	Samme	Mindre	Ved ikke
Friske grønsager (F.eks. salat, agurk, gulerødder)	(1) ❑	(2) ❑	(3) ❑	(4) ❑
Frisk frugt (f.eks. æbler, pærer, appelsinder)	(1) ❑	(2) ❑	(3) ❑	(4) ❑
Kød (f.eks. kylling, koteletter, fisk)	(1) ❑	(2) ❑	(3) ❑	(4) ❑
Fuldkornsprodukter (f.eks. fuldkornsbrød eller fuldkornspasta)	(1) ❑	(2) ❑	(3) ❑	(4) ❑
Drikkevarer (f.eks. koldt dirkkevand, frugtjuice, ikke sodavand)	(1) ❑	(2) ❑	(3) ❑	(4) ❑
Fedtfattige mælkeprodukter (f.eks. fedtfattig mælk, fedtfattig yoghurt)	(1) ❑	(2) ❑	(3) ❑	(4) ❑
Friturestegt mad (f.eks. pommes fritter, chicken	(1) ❑	(2) ❑	(3) ❑	(4) ❑

	Mere	Samme	Mindre	Ved ikke
nuggets)				
Pølser	(1) ❑	(2) ❑	(3) ❑	(4) ❑
Chokolade	(1) ❑	(2) ❑	(3) ❑	(4) ❑
Slik	(1) ❑	(2) ❑	(3) ❑	(4) ❑
Chips	(1) ❑	(2) ❑	(3) ❑	(4) ❑
Kage	(1) ❑	(2) ❑	(3) ❑	(4) ❑
Sodavand	(1) ❑	(2) ❑	(3) ❑	(4) ❑

Hvad er efter din mening den primære årsag til at disse ændringer?

(1) ❑ For at mindske omkostningerne

(2) ❑ For at imødekomme ernæringsanbefalinger

(3) ❑ For at imødekomme efterspørgelse

(4) ❑ Andet _____

Skyldes ændringerne efter din mening politiken vedrørende offentlig indkøb af økologiske varer (POP)?

(1) ❑ Ja

(2) ❑ Nej

(3) ❑ Ved ikke

Kommentar og feedback Til sidst vil vi gerne have evt. kommentar eller andet feedback.

Alle kommentar er velkomne!

Kommentar og feedback

Spørgeskemaet er færdig

Tak for din besvarelse!

Tryk på krydset nederst til højre for at fuldføre besvarelsen og vinduet vil lukke.

Appendix C

Invitation letter (e-version)

Til <%name%>,

Må vi spørge til jeres skolemadsordning?

Vi er på FVI(Fødevareinstituttet)/DTU(Danmarks Tekniske Universitet) i gang med en webbaseret spørgeskemaundersøgelse om mad og sundhed på skolerne og vi vil gerne vil bede om din deltagelse. Spørgeskemaet tager ca. 15 minutter at besvare. Det er meget brugervenligt og ligetil. Din besvarelse vil indgå i arbejdet i det internationale iPOPY projekt (innovative Public Organic food Procurement for Youth). Hovedformålet med dette projekt er at kortlægge forbruget at økologiske fødevarer i folkeskolerne samt at finde ud om dette forbrug har effekt på skolens mad udbud. Det betyder at vi er interesserede i svar fra såvel skoler som har og som ikke har økologiske fødevarer i deres udbud. Undersøgelsen bliver gennemført i Norge og Danmark.

Du kan hjælpe os med at få dette overblik ved at deltage i besvarelsen af vores spørgeskema på:

→ LINK ←

Alle besvarelser er af stor værdi for os. Som en anerkendelse af bidragene vil vi derfor blandt deltagerne udtrække en præmie, hvor vinderen kan besøge et spændende skolemadsprojekt i Italien. Selvfølgelig med alle omkostninger dækket.

Spørgeskema undersøgelsen bliver lukket kl. 12.00 den 21. Maj i år, så vi vil bede dig udfylde det inden da.

Hvis ikke du er den der bedst er i stand til at vurdere spørgeskemaet indhold, vil vi bede dig enten videresende det til den relevante person, eller skrive tilbage til os med oplysninger på den bedst egnede person. Dette vil være den ansvarlige for skolens madordning.

På forhånd tak for din deltagelse.

Med venlig hilsen

Bent Egberg Mikkelsen og Chen He

PS. Hvis du har nogle spørgsmål, så kontakt endelig en af os på nedenstående e-mail / telefon.

Bent Egberg Mikkelsen

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Appendix D

Remind letter 1

Til <%name%>

Vi har for en uges tid siden sendt Jer et spørgeskema vedrørende Jeres skolemadsordning. Vi kan se I endnu ikke har svaret, eller kun har svaret delvist.

Spørgeskemaet er blevet forbedret i mellemtiden. Bl.a. er det ikke længere nødvendigt at opgive personlige informationer hvis du ikke ønsker det, ej heller adresse oplysninger om skolen.

Hvis I har besvaret delvist, er de svar du allerede har indtastet gemt i systemet. Således skal du ikke udfylde disse igen. Spring blot disse spørgsmål over.

Vi vil bede Jer udfylde skemaet på:

→Link ←

Alle svar har stor betydning for os og vi håber I kan finde tid. Hvis I ikke har tid, beklager vi ulejligheden og I kan selvfølgelig se bort fra denne e-mail.

På forhånd tak.

Med venlig hilsen

Bent Egberg Mikkelsen og Chen He

PS. Hvis du har nogle spørgsmål, så kontakt endelig en af os på nedenstående e-mail / telefon.

Bent Egberg Mikkelsen

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Appendix E

Remind letter 2

Til <%name%>

For ca. 14 dage siden sendte vi et link til et spørgeskema om skolemad til Jer. Vi kan se I endnu ikke har besvaret skemaet, eller kun delvis har besvaret det. Spørgeskemaet bliver lukket på onsdag kl. 12. Vi vil bede Jer besvare det inden da så frem i har tid. Hvis ikke kan I selvfølgelig blot se bort fra denne e-mail og vi beklager ulejligheden.

Skemaet kan I finde på:

→Link ←

Med venlig hilsen

Bent Egberg Mikkelsen og Chen He

PS. Hvis du har nogle spørgsmål, så kontakt endelig en af os på nedenstående e-mail / telefon.

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Appendix F

Analyzing data with Microsoft Excel- Building the diagrams

The raw data was exported from the web based questionnaire software and inputted into Microsoft Excel 2007. From here the data was filtered to select and find the answers for the question or questions of interest.

The selection of data was done by filtering on one or more column using the build in filter function in Excel. This way the unwanted data was hidden and only the data of interest was shown. Unfortunately Excel doesn't have build in functions for calculating and counting using the filter/hidden row functions. Therefore two small VBA (Visual Basic for Applications) functions/macros were developed to support counting of answers and calculation of average values.

When the desired values were found, the diagram was made based on these values. In some cases where diagrams are showing answers from multiple questions, the data had to be collected in several steps.

The process was repeated, one time for each diagram.

Some questions which show an average value, the values from the answers needed to be replaced with other values. This is described in appendix G, H and I.

VBA count function

The source code for the VBA counting function is shown below.

```
Function CountVisible (Cells_To_Sum As Object, Value As Integer)

       Dim count As Integer



       count = 0



       For Each cell In Cells_To_Sum

           If cell.Rows.Hidden = False Then

               If cell.Columns.Hidden = False And cell.Value = Value Then

                   count = count + 1

               End If

           End If

       Next



       CountVisible = count



End Function
```

VBA average function

The source code for the VBA average function is shown below.

```
Function AverageVisible(Cells_To_Sum As Object)



       Dim count As Integer



       count = 0



       For Each cell In Cells_To_Sum

           If cell.Rows.Hidden = False Then

               If cell.Columns.Hidden = False And cell.Value <> "" Then

                   Total = Total + cell.Value

                   count = count + 1

               End If

           End If

       Next



       AverageVisible = Total / count



End Function
```

Appendix G

Calculation of the opinions

In order to calculate the average opinions, a scale to work from, had to be made. The answers on the scale should be correctly balanced. Furthermore the values for the answers also needed to be balanced in order to make a reasonable correct analysis. The table below shows a balanced scale with answers and values together.

Answering option	Value
Very much agree	7
Agree	6
Partly agree	5
Don't know/neutral	4
Partly disagree	3
Disagree	2
Very much disagrees	1

This scale is the origin of values that the final value assignment was based on. Not all answering options in the above scale were presented in the WBQ. In the questionnaire only 4 options were presented. For this reason the final value assignment was slightly modified.

Since the 'Very much disagrees' option isn't present in the questionnaire, all values are lower with one point. By this way, the scale has the interval 1 to 6 instead of 2 to 7.

The 'Very much agree' is additionally lowered one point in order to avoid too big distance in values between the first two available answering option in the questionnaire. This was done to make the answers more balanced based on the assumption that since the answering options were limited in numbers, the real opinion of the respondents would be reflected by using these values instead. Analysis with 'Very much agree' assigned with value 6 showed average opinions which seemed to be too positive to be realistic. So the final scale ended with the interval from 1 to 5.

The final value assignment for each answering option is shown in the table below.

Answering option	Value
Very much agree	5
Partly disagree	2
Disagree	1
Don't know	3

These assumptions had to be made since the answering options were initially poorly selected in the questionnaire. After the analysis started this was discovered. Instead the all the answering options from the original scale should have been presented. One of the reasons this wasn't discovered earlier was due to a translation mistake. The 'Partly agree' option was originally translated from the English version into 'Partly disagree' (in the Danish version), which would have made the scale a bit more balanced according to the questions and the expected answers.

The final analysis result shown on the diagram, is based on the final modified scale. This way 'Very much agree' is replaced by an 'Agree' instead. The table below shows the values of the labels on the Y axis in the diagram.

Answering option	Value
Agree	5
Neutral	3
Disagree	1

The average for each question was calculated simply by adding all values together and divided by the number of answers.

Appendix H

Calculation of the percentage of milk types

The calculation of the average in milk types are a value base average. Each answer option was assigned a value. The following values were assigned:

The values of milk types

Answer	Value
0 - 20 %	10
20 - 40 %	30
40 - 60 %	50
60 - 80 %	70
80 - 100 %	90
Don't have	Ignored

1. The 'Don't have' answers were removed from the data. This means the schools which don't offer the milk type isn't included in the calculation and doesn't affect the average for this milk type. The school which didn't answer the question was ignored too.
2. Each schools answers were modified by weight so the value of all answers from the school was 100 total. This was due to the imprecise answering options.
3. The averages were calculated by simply adding all the modified values from the answers from each question together and then divided by the number of answers.
4. Even though the answer was initially modified, the total average of all schools added together was higher than 100 percent. Therefore the total result for each question was additionally modified by weight to give a total of 100 percent for all milk types. These numbers are shown in the diagrams.

Appendix I

Calculation of the development of food items

The development of food items are calculated on value based average. The follow values were assigned to the answers:

The values of food items

Answer	Value
More	3
Same	2
Less	1
Don't know	Ignored

1. The 'Don't know' answers were removed from the data. The school which didn't answer the question was ignored too.
2. The averages were calculated by simply adding all the values from the answers from each question together and then divided by the number of answers.