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Title:

Design and pilot testing of a dietary assessment methodology for children at school

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Sammendrag:

Baggrund: Ernæringens indvirkning på individers sundhed, og bæredygtigt forbrug, er begge emner der længe har været på den offentlige og politiske dagsorden, men ofte betragtet som to særskilte debatter. Dette er overraskende, eftersom mange innovationsprojekter indenfor fødevareområdet drejer sig om både sunde kostvaner og bæredygtigt forbrug (økologisk kost). I dette projekt er det sammenhængen imellem disse to forhold der udgør baggrunden for studiet. Undersøgelser har vist, at økologiske kantiner generelt tenderer til at servere sundere menuer end tilsvarende konventionelle kantiner, men der findes stadig ingen undersøgelser, foretaget med skolemadsordninger som fokusområde.
Formål: Formålet med denne rapport er at undersøge og udvikle metoder der kan belyse sammenhængen mellem børns spisevaner og økologiske indkøbspolitikker på danske folkeskoler.
Metode: På baggrund af faglitteratur, de nationale kostråd samt erfaringer fra andre succesfulde spørgeskemaundersøgelser, er der udarbejdet et selvadministreret spørgeskema, der belyser børnenes spisevaner. Spørgeskemaet er testet via ekspertvurderinger og Tænke-Højt Interviews, hvorefter justeringer er blevet integreret i spørgeskemaet.
Konklusion: Børn i danske 6. klasser kan benyttes som respondenter i undersøgelsen, hvis der tages særligt hensyn til deres læseevne og kognitive udvikling. Det er vurderet at et tværsnitsstudie vil være en tilstrækkelig metode til at undersøge sammenhængen mellem økologiske indkøbspolitikker og børnenes spisevaner. En variation af et 24-timers Kost Interview, et Frekvensspørgeskema og den metode til måling af børns viden som blev udviklet i dette studie vil kunne sammensættes i et spørgeskema, sådan at dette samlet set bredt vil kunne belyse børns spisevaner. Repræsentative 6. klasser på skoler som har valgt at tilbyde økologisk mad til eleverne udvælges via cluster sampling og matches med tilsvarende klasser på skoler som har valgt at tilbyde konventionel mad til eleverne, hvorefter resultaterne kan sammenlignes.

Summary:

Background: Nutrition's impact on an individual's health and sustainable consumption of food are issues that have long been on both the public and political agenda but are often viewed as two separate debates. This is surprising since many innovation projects in food service systems are concerned with both healthy eating and sustainable consumption (organic food). The relationship between them forms the background in this study. Evidence has shown that caterers serving organic food tend to also serve healthier meals than their non-organic counterparts but, so far, no studies have been carried out in school food environments.
Aim: The aim of this report was to investigate and develop appropriate methods for studying the link between healthy eating practices and organic food procurement policies using Danish public elementary schools as a setting.
Methods: Based on relevant scientific literature, the Danish Dietary Recommendations, and inspired by other successful studies, a self-administered questionnaire investigating children's eating habits was designed. After testing by an Expert Evaluation Panel and Think Aloud Interviews adjustments were integrated.
Conclusion: If special attention is given to literacy skills and cognitive development, children in Danish 6th grade classes can be used as respondents in studies of the relation between food procurement policies and eating practice. The study suggests that a Cross-Sectional design is a satisfactory method to investigate the association between organic procurement policies and children's eating habits. A variation of a 24-hour Recall study, a Food Frequency Questionnaire and a method developed during the reported study to identify children's knowledge of fruit and vegetables may be combined to cover children's overall eating habits. The study suggests that representative 6th grade classes at schools with organic food policies can be selected by cluster sampling and matched with corresponding classes at schools without organic food policies, after which the results could be compared.

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Picture front-page from left to right:
Liv Birkeland, Matthias Koesling and Jon Magne Holten
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Foreword

This report is an edited version of a bachelor thesis based on an internship in WP5 of the iPOPY project The bachelor thesis was written as a part of the European research project, "innovative Public Organic food Procurement for Youth (iPOPY)." This is one of eight pilot projects funded by the CORE Organic funding body network; www.coreorganic.org. The countries participating in iPOPY are Denmark, Finland, Italy and Norway (5: See chapter 7. Internet pages). Through the use of interdisciplinary and strategic research, iPOPY aims to assist decision-makers in the food and catering sectors to develop innovative, sustainable and targeted supply systems and policies that can support the implementation of healthy, organic meals for young people in schools and other public institutions (4). iPOPY consists of five work packages. The bachelor thesis was a part of work package 5 (WP5), which aims to *"study the potential of organic food in relation to health and obesity risks"* (4). The focus of WP5 is on nutrition and health, with emphasis on the nutritional aspects of organic school meals (6). Public organic food Procurement (POP) is explored as a potential incentive for healthy eating among young people, by increasing knowledge about sustainable nutrition, supporting the introduction of organic food in relevant public food outlets and encouraging the modification of dietary patterns (4). The methodology developed in the current study will be developed further in the large scale study that is planned for WP5.

The development of the methodology has been guided by a number of colleagues. Thanks to Sisse Fagt cand.brom., Marianne Sabinsky cand.scient. and Inge Tetens, research director, all from the Nutrition Department at the National Food Institute, DTU. Thanks to Mala Ranawake for proofreading the report, to the management at Ravnsholtskolen, Allerød Municipality and to Emil Kragh Mikkelsen, Kasper Klan Hansen, Mette Reehaug, Anna Græsdal and their parents for helping us testing the methodology. Finally thanks to Anne-Kristin Løes, Bioforsk for valuable comments to the manuscript and to Jette Elkjær and Tina Olsen for helping make the manuscript camera ready. The initial part of the work has been carried out at Danish Technical University and the project has been conducted at Aalborg University after 1st of April 2009.

Bent Egberg Mikkelsen[1]

Leader of iPOPY WP5, Professor PhD,

September 2009

[1] Part of the field work reported here has been carried out at DTU. The analysis and final editing of the document has been carried out at Ålborg University as a consequence of Bent Egberg Mikkelsens transfer hereto.

Contents

1. Introduction

Overweight and obesity in children have escalated dramatically in Europe over the past decades and are now common among many school children. The WHO estimates that about 20% of children in the European Region are overweight, and a third of these are obese (Branca et al., 2007). Being overweight and obese have physical, psychological and social consequences for children (Dietz, 1998), as well as long term costs for the society (Richelsen et al., 2003). As eating habits in childhood often track into adulthood (Mikkila et al., 2005) and is becoming, with time, even more difficult to change, it is important to focus on supporting children to develop healthy eating habits from an early age (Richelsen et al., 2003). Children's food intake at school has a major impact on their health, as up to half of their daily food intake occurs during school hours (Biltoft-Jensen et al., 2005). Consequently, schools have become an important setting for dietary intervention directed at children.

Choice of diet not only influences our health but also has an impact on the environment. As the environment debate has gained more importance on the current political agenda, it is now more generally agreed that it is necessary to take action and focus on sustainable solutions (Saxe et al., 2006). This emphasises the importance of taking environmental concerns, including the question of organic versus conventional foods, into account when designing new dietary interventions. The public, especially, has shown interest in developing sustainable food procurement policies and strategies by introducing organic food procurement in supply chains for public institutions.

For these reasons, there is considerable interest in strategies that can improve eating habits among school children, and "healthy eating interventions" in school settings are being developed in many countries (Clift & Jensen, 2005). At the same time, school has become one of the preferred settings for public organic food policies in Denmark and a number of other countries. Such policies are known to foster changes in the organisational environment, i.e. local food and nutrition policies and menu composition which, in turn, create an interesting platform for further investigation (1). Evidence has shown that caterers serving organic food also serve healthier meals than their non organic counterparts (Mikkelsen et al., 2006). However, it remains to be proven whether organic policies in school settings promote healthier eating on an individual intake basis. A variety of different techniques for measurement of habitual dietary intake are available. However, most of these methods are expensive, time consuming and demand a certain literacy level and motivation which makes them unsuitable for young children (Margetts & Nelson, 1997). Suitable methods must therefore be developed.

This report consists of three parts. First, similarities and differences of the national (and regional) school meal systems are discussed in general without regard to organic food, because this broader context determines the scope of organic food procurement. Important aspects of the national school meal context are a) the history and current situation of the school meal systems, b) framework conditions of public food procurement in schools (laws, guidelines, control, financing), c) the structure of the school meal provision, and d) public discourses about school meals (chapter 2). The second part describes the use and development of organic food in school meal systems. The mentioned POP cases can be characterised by a) the amount of organic food used in school meal systems, b) the arguments for organic school food, and c) challenges and barriers for the dissemination of organic food (chapter 3). In the third part, actors in the school meal context in general as well as "organic actors" such as promoters, decision makers, companies, organisations etc. are compared across the four analysed countries (chapter 4), and conclusions are drawn (chapter 5). Each chapter describes first the situation in Italy and Finland, thereafter the situation in Denmark and Norway.

1.1 Study aim

The main objective of the bachelor study was to develop and test a methodology that was able to verify or reject the hypothesis that organic food policies in schools act either directly or indirectly as a driver for healthier eating among school children. To develop appropriate methods for studying the link between healthy eating practices and organic food policies in a public elementary school setting, it was desirable to test the possibilities of using pupils as respondents.

1.2 Research question

How can a study be designed to investigate whether public organic food policies can promote healthy eating patterns in Danish school children?

1.3 Specification and delineation of the subject area

This study was limited to deal with the design phase of a more comprehensive study, and does not focus on data collection and statistical analysis. Further, it focuses on general eating patterns rather than intake of single nutrients and food items. The questionnaire, so far, is only developed in Danish, as the study was carried out in a Danish context.

1.4 Definition of health

The perception of health on which this study is based is the WHO's definition from 1947: *"A complete state of physical, mental, and social well-being and not merely the absence of disease or infirmity"* (WHO, 1947). As seen, many factors constitute a healthy life and "health" is something more than the opposite of sickness.

In the bachelor study, emphasis was therefore put on the thoughts behind the Ottawa Charter, "*where health is seen as a resource for everyday life, not the objective of living*" (2) and where health promotion in a broad perspective seeks to create optimal conditions for individuals as well as communities. Fundamental prerequisites for health mentioned in the Ottawa Charter are "*peace, shelter, education, food, income, a stable eco-system, sustainable resources, social justice, and equity*" (2). Therefore these basic prerequisites must also be addressed in any health promotion strategy and three of them are of particular interest to the present study: Sustainable resources, equity and food security. Food security in this context can be understood as the availability of and access to healthy food in schools.

When delegating responsibility for school children's eating habits, it is important not to "blame the victim", meaning not focus only on eating habits and obesity as an individual responsibility of the children and their families but also focus on the influence of broader and more fundamental structural factors. It is vital to give all children equal opportunities for making healthy choices. Therefore, it is important to gain knowledge through nutritional epidemiological studies of how school food interventions should be established to create sustainable solutions. Interventions that reduce inequality in society and take the natural environment into consideration enhance the health of children.

1.5 Methods

The nutritional section is based on nutritional epidemiology. The recognised psychologist Jean Piaget's theory about the Stages of Cognitive Development was used to elucidate children's ability to act as respondents in dietary assessment methods.

In natural science, there is sharp distinction between the scientist as a scientist and the scientist as a person with personal opinions and feelings. It is therefore necessary to remain objective, containing oneself to verify and describe statements free of judgement, feelings and beliefs (Jacobsen et al., 1999). With this background, the overall objective of the present study was to provide objective knowledge about how organic food policies in schools affect children's eating patterns. The manner in which this knowledge is then utilized is a political question.

It may be questioned whether research can claim to be opinion-free in reality as is ideally required. All research relies on funding, the prioritising and distribution of which are affected by differing interests and it is difficult to remain uninfluenced. This can affect the direction of research and knowledge growth. This is especially apparent within applied research; in a time of overshadowing environmental problems, it may be politically astute to focus research on organics and sustainability. Indeed, there is a growing market for organic products, which attracts and involves commercial interests. The iPOPY project, which creates the framework for this study, aims to research the barriers and opportunities related to organic food supply for young people. From the outset, there is therefore a certain interest in demonstrating a positive association between organic school meals and health.

During the development of the questionnaire, we first investigated the respondents' knowledge of various vegetables. It was expected that schools with organic food policies would use more seasonal food and hence a wider variety of vegetables. On the other hand, it could be expected that the variety of fruits in schools with an organic food policy would be narrower due to the limited availability of organic fruit and the premium price. Consequently, a section covering fruit availability was added to the questionnaire.

Studies, government reports and documents, reports from Danish and international organizations and textbooks have been referred to provide broader insight into the background of the study, choice of relevant study design and the considerations to be made in relation to using children as respondents. Primary literature was chosen where possible. Studies selected through the Pubmed Medline database were identified by the following keywords and combinations:

Organic food OR sustainable food OR environmentally friendly OR ecological
AND
Eating patterns OR eating habits OR food habits OR food patterns
AND
6th graders OR 12 years OR 13 years OR adolescent(s) OR student(s) OR pupil(s) OR children OR school children OR youth OR teenager(s) (42 matches, none of them relevant)

School lunch OR school food OR school meals OR school canteens
AND
6th graders OR 12 years OR 13 years OR adolescent(s) OR student(s) OR pupil(s) OR children OR school children OR youth OR teenager(s)
AND
Europe OR European (125 matches)

6th graders OR 12 years OR 13 years OR adolescent(s) OR student(s) OR pupil(s) OR children OR school children OR youth OR teenager(s)
AND
Nutrition OR healthy eating OR dietary
AND
School lunch OR school food OR school meals OR school canteens
AND
Questionnaire OR food frequency questionnaires OR dietary assessment
AND
Self-administered OR self completed OR self completion
AND
School lunch OR school food OR school meals OR school canteens

AND
Europe OR European (19 matches)

The search terms were identified by reading relevant literature and using a thesaurus to find synonyms, as well as using the MeSH database to indentify more broad and narrow terms.

No comparable study was revealed by the literature searches.

The present study is based on the two most prominent questionnaires in Europe that use children as respondents, Pro Children (Haraldsdóttir et al., 2005) and the Health Behaviour in School-aged Children study, - HBSC (Rasmusen & Due, 2007), due to their focus on school children and to some extent their diet. Both studies are regularly conducted in Denmark by the Institute of Public Health at the University of Copenhagen – www.si-folkesundhed.dk.

Literature focusing on children as respondents in quantitative research is very limited (Andersen & Kjærulff, 2003), and it was not possible to find references with a special focus on diet. The theoretical background of the questionnaire design was based on two reports from The Danish National Centre for Social Research; *"Hvad kan børn svare på?"* (Own translation: "What is it possible for children to answer?"), (Andersen & Kjærulff, 2003) and *"Børn som respondenter*" ("Children as survey respondents") (Andersen & Ottesen, 2002).

2. Background of the study

Nutrition's impact on health and the sustainable use of resources are issues that have long been on both the public and political agenda and often viewed as two separate debates. As opposed to this the relationship between the two fields will form the background of this study. This will be further discussed in the present chapter.

2.1 Nutritional demands on school food

It is vital that every person meets his or her nutritional requirements. This is especially true for children, to provide a good start in life and healthy growth and development (Astrup et al., 2005). Experience shows that children gain the best possible learning and behavioural prerequisites from eating healthy and varied food spread evenly throughout the day. It is important to encourage healthy eating patterns early in life, as both constructive and non-constructive behavioural patterns are established in childhood (Ovesen, 2004).

Preventative intervention is particularly important for overweight and obesity, as they greatly influence children's short- and long term health. Immediate consequences may include being hampered or even prevented from playing with other children and participating in sports, low status and psychological problems, low self esteem and social isolation (Sundhedsstyrelsen, 2007). A further consequence of childhood overweight is the likelihood of its tracking into adulthood (Spalding et al., 2008). In the long run, childhood obesity can therefore contribute to a range of lifestyle diseases, such as type-2 diabetes and cardiovascular disease, both of which are significantly responsible for excess mortality among the Danish population (Richelsen, 2003). In addition to the individual consequences, overweight and obesity pose a heavy strain on society. The treatment of obesity and obesity related diseases accounts for 5–10% of the Danish health care system's total expenditure (Heitmann et al., 1999).

Schools have become an important setting for dietary interventions directed at children, since up to half of their daily food intake occurs during school hours (Christensen, 2007). According to the Nordic Nutritional Recommendations, it is appropriate that school aged children consume five to six meals per day (Nordic Council of Ministers, 2004). Dependent on the length of the school day, one or more light meals, e.g. fruit or vegetables, should be served in addition to a proper lunch. To ensure that school food contributes positively to the children's overall diet, it is important that they are offered healthy and appealing meals that comply with the Nordic Nutritional Recommendations (Nordic Council of Ministers, 2004) and the Danish Dietary Recommendations (Biltoft-Jensen et al., 2005).

Results from the Danish National Survey of dietary habits 2000-2004 show that children's general intake of fruit, vegetables, fish, wholemeal bread and potatoes was too low. They consume too much confectionary and drink too many sugar-sweetened drinks according to the recommendations (Fagt et al., 2007). On this basis and since some of the emerging school food cases have shown to be of poor quality, the National Food Institute in 2007 developed a set of nutritional requirements for Danish school food (Christensen, 2007) to help schools adjust dietary habits in a more healthy direction.

Summary of the Danish guidelines for healthy school food

Requirements for manufactured and semi-manufactured ingredients: Schools are advised to buy products according to "Ernæringsmærket", the Danish nutrition labelling recommendations (Christensen, 2007). "Ernæringsmærket" is separated into three categories: "Most", "Little" and "Less", symbolising the relative quantity of food that can be eaten within a healthy, varied diet (Fødevarestyrelsen, 2005). Emphasis should be placed on products from the first group (Christensen, 2007).

Meals and energy intake: The average energy intake for lunch meals should be 55E% carbohydrates, 15E% protein and 30E% fat, with maximum 10E% saturated fat, E% refers to the amount of energy in the meal provided by carbohydrates, fat and protein respectively. Light meals or snacks should contain maximum 10E% added sugar and maximum 10E% saturated fat. The size of the meals should reflect the energy needs of the children, specific to their age groups (Christensen, 2007).

Focus on fruit and vegetables: Meals should always include fruit and/or vegetables (1/3 of the weight of the entire meal) and they should also be offered as a supplement. It is recommended that the supply of fruit and vegetables vary according to season. The quantity of dried fruit should be limited (Christensen, 2007).

Focus on fish: Every fifth meal should include fish; variation in types of fish is recommended (Christensen, 2007).

Focus on bread and potatoes: Bread high in dietary fibre should be offered. It is recommended that potatoes are served frequently. If potatoes are replaced with pasta, rice, couscous etc., it is recommended that more fruit and vegetables are added to the meal to counterbalance fibres and vitamins contained in potatoes (Christensen, 2007).

Focus on meat, cheese, dressings and sauces: Meat, cheese, dressings and sauces that contain a high amount of fat should be limited and only offered as part of a complete meal, e.g. cheese sticks and sausage rolls should not be served alone (Christensen, 2007).

Focus on low fat and low sugar dairy products: Dairy products high in fat and sugar must be limited and products containing artificial sweeteners must be avoided, according to "Ernæringsmærket" (Christensen, 2007).

Focus on absence of confectionary, cakes and crisps: Availability of cakes and muesli bars should be limited. Sweets, chocolate, ice cream and such should not be offered at all (Christensen, 2007).

Focus on water and absence of sugar sweetened drinks: Chilled tap water must be freely available. Drinks that are sugar-sweetened and high in fat, including chocolate milk and milkshakes, should not be available. Only the smallest sizes of fruit and vegetable juices should be offered (Christensen, 2007).

The mentioned guidelines focus on nutrition alone, but there are many variables that influence the health aspects of school food. Factors such as food consumption policies, eating environments, social factors, teacher presence, duration of lunch break and product origin (such as fair trade, locally grown and organic) might also be important aspects to include if health is to be seen in a broad and positive way. For example, the new guidelines for working place cantinas aim to use organic food ingredients (Fødevarestyrelsen, 2008).

2.2 Impacts of organic food on human nutrition

Owing to the focus of this study, the impact of organic food on health will be briefly examined. In broader perceptions of health, the sustainable aspects of organic farming and production are not to be underestimated as they decrease the strain on the natural environment. In this context, however, focus will be placed on organic foods' direct and indirect influence on human nutrition.

In recent times, health and the nutritional effects of organic food consumption have gained increasing attention in the scientific community. Attempts have been made to compare single items of organic food with items of conventional food in the search for differences in substances that might influence nutrition (Mikkelsen, 2005). A Danish review of organic foods influence on health concludes that organic vegetables are characterised by a higher content of vitamin C and dry matter and often a higher content of minerals and secondary metabolites, when compared with conventional vegetables (O'Doherty et al., 2001). Higher contents of certain fatty acids and micro nutrients in organic animal products have also been found (O'Doherty et al., 2001), probably because organic cattle get less concentrates and graze during the summer months. Due to the restriction of antibiotics in organic farming, the concentration

of such medical residues and antibiotic resistant bacteria in animal products are expected to be lower. With respect to processing, organic products contain fewer additives than conventional food, as additives are only allowed on a limited scale (O'Doherty et al., 2001). Recent research has shown that certain artificial food colours can enhance hyperactivity in children (McCann et al., 2007).

Instead of observing the nutritional benefits that arise from the composition of organic food, it might be more relevant to test the changes in diet that tend to result from adopting organic policies or life styles. Compliance with existing nutritional recommendations appear to be more easily achieved by those adhering more strictly to the use of organic products (O'Doherty et al., 2001).

3. Defining the research methods

Decision makers require well documented scientific knowledge to make suitable decisions related to public health nutrition. Therefore, research questions should be addressed by well designed studies in the field of nutritional epidemiology. In practice, ambitions for precise answers must be compromised by the available resources. In this chapter the methodological considerations behind the study will be defined.

3.1 Operationalisation

Main concepts of the study hypothesis require definition, to identify which variables are required to investigate the research questions:

Organic food procurement policy: A documented agreement to buy organic in preference to non organic products. This agreement can either be instigated by a municipality or the school itself.

School food systems: The provision of prepared food (rather than just fruit or milk, as is common in many Danish schools) in public elementary schools.

School children: This study focuses on Danish children in 6th grade (age 12–13 years) attending public elementary schools.

Healthier eating: Is defined as following the Danish Dietary Recommendations as set out below:

-Eat fruit and vegetables – 6 pieces/portions per day

-Eat fish and fish products – several times a week

-Eat potatoes, rice or pasta, and wholemeal bread – every day

-Limit intake of sugar – particularly from soft drinks, confectionary and cakes

-Eat less fat – particularly fats from meat and dairy products

-Eat a varied diet – and maintain a healthy body weight

-Drink water when you are thirsty

-Engage in physical activity – at least 30 minutes a day

The aim of the operationalisation is to turn vague constructs into something that can be measured and therefore quantified. “Healthier eating” is an ambiguous concept and cannot be directly measured but we can indirectly measure it if it is appropriately operationalised. In so doing, the Danish Dietary Recommendations can be divided into specific operational definitions that can subsequently be converted into specific questions, the answers to which will later act as indicators for the original concept. For example, a high intake of fish serves as an indicator of “healthy eating”, even though in this case it is only one of several variables of the concept. Because the study focuses solely on eating habits, no references were made to the last dietary recommendation which relates to physical activity.

3.2 Children as respondents

The view on children has changed over time. They must no longer be “seen and not heard” and “only speak when spoken to”. In modern society, children have rights. They are seen as competent individuals, legal subjects and are expected to have opinions and knowledge which can and should be taken into account (Andersen & Kjærulff, 2003). This was manifested in 1989 by the UN “Convention on the Rights of the Child”, in particular the 12th article: *“States Parties shall assure to the child who is capable of forming his or her own views the right to express those views freely in all matters*

affecting the child, the views of the child being given due weight in accordance with the age and maturity of the child" (7). When collecting data about children the desire to give children a voice has increased willingness to question the children themselves, instead of parents or other adults with knowledge of the children and their condition as was previously the tradition. The interest in questioning the children directly may have several foundations. In a pedagogic light, children will only learn to articulate themselves when given the chance and when adults show them respect as equal human beings. Another reason is that adults do not know everything about children, who will be able to provide more precise information themselves (Andersen & Kjærulff, 2003). Thirdly, it may be considered a democratic problem if children and adolescents as well as other groups are not directly involved in research (Andersen & Ottesen, 2002). In order not to discriminate against children by age, methods must be developed according to the children's ability to give valid answers. Specific knowledge of the children's cognitive development is essential to this process, although very little literature has been reported on children's cognition in regard to food (Baranowski & Domel, 1994). Psychologist Jean Piaget's four stages of cognitive development can be used as a guideline to identify the age group most appropriate for the study (Table 1).

Table 1: Piaget's Stages of Cognitive Development (Woolfolks, 2004)

Stage	Approximate age	Characteristics
Sensomotorical stage	0-2 years	Begins to make use of imitations, memory and thoughts. Begins to recognise that objects do not cease to exist when they are hidden. Moves from reflex action to goal directed activity.
Preoperational stage	2-7 years	Gradually develops use of language and ability to think in symbolic form. Able to think an operation through, logically in one direction. Has difficulties seeing another person's point of view.
Concrete operational stage	7-11 years	Able to solve concrete problems in a logical fashion. Understands laws of conservation and is able to classify and seriate. Understands reversibility.
Formal operational stage	11-adult	Able to solve abstract problems in a logical fashion. Becomes more scientific in thinking. Develops concerns about social issues, identity.

To convert amounts eaten into household measures (as necessary in a recall questionnaire) and in order to estimate average frequency for intake, ability of abstract thinking must be present. Children chosen as respondents must therefore have reached the "Formal operational stage" (Table 1), to be capable of understanding hypothetical questions and options for different answers.

Jean Piaget hypothesises that all children pass through these four stages of cognitive development in the same order (Woolfolks, 2004). A critique of Piaget's stage model is that children develop gradually and at different paces and huge variation in personal development can occur among children of the same age. Optimally, individual judgment of each individual child's maturity should therefore be made, though this is seldom possible. Age, so far, is the best indicator with which to predict the average development stage of the children (Andersen & Kjærulff, 2003). Children in 6th grade have been chosen as respondents in this particular study, as in Denmark these children are usually between 12 and 13 years of age and are therefore expected to have reached the formal operational stage.

Though children are the main respondents in the study, it is necessary to involve the parents, since some information can be difficult for children to answer, such as background information about their families (Olsen, 2006). A small questionnaire for the parents is therefore necessary to provide this information. Also, the parents need to give consent to their child´s participation in the study and it is for this reason that the questionnaire contains a consent form for the parents (Appendix 2).

3.3 Choice of study design

Generally, epidemiological studies can be designed in one of two ways: By observational or by interventional/experimental studies. In observational studies the investigator simply observes and records and has no control over the way in which subjects are exposed, while in experimental studies the investigator controls exposure and observes the effect. Experimental studies are usually known to provide the strongest evidence but are often more resource demanding (Margetts & Nelson, 1997). In the current project, an observational study design has been chosen and the study therefore focuses on pupils from schools with existing organic food policies, comparing them to pupils from schools without organic food policies.

Observational studies can be executed either by focusing on groups or individuals. Using a group approach, sales statistics from school canteens could possibly provide a picture of the children's general food intake during school hours. However, it is of interest to study personal consumption patterns, because observations made at group level might not necessarily reflect the true pattern at the individual level. For example, some children might eat very healthy, and their consumption may have a misleading effect on the statistics.

Observational studies of individuals can be divided into descriptive or analytical studies. A descriptive study merely describes the distribution of a characteristic while an analytical study describes associations between measured characteristics and analyses them for possible causes and effects (Fathalla & Fathalla, 2004). As this study seeks to investigate the association between children's eating habits and whether or not the school they are attending have an organic food policy, the study design is analytical.

Dietary assessment can either be prospective or retrospective. Prospective methods entail recording a current diet (directly during eating), while retrospective methods require subjects to recall a recent or past diet. The main advantage of a prospective method is that they do not rely on respondents' memories. The disadvantages of assessing dietary habits prospectively are that respondents may adopt a healthier diet than they usually consume, due to a wish to please the investigator, or they may simplify their diet in order to make recording easier, as this process is labour intensive. Retrospective assessments of dietary habits are advantageous as they place a smaller burden on respondents. On the other hand, the responses are based on memory and judgement, which may easily lead to either overlooking or over/under estimation of specific food items (Geissler & Powers, 2005). In this study it was important to gain a generalised picture of children's diet.

Diet studies may be either cross-sectional, where measurements are made with many respondents on a single occasion, or longitudinal, where measurements are made with respondents over a period of time (Margetts & Nelson, 1997). A cross-sectional study is cheaper and more rapid, providing a snapshot of information about the associations between healthy eating and organic food policy at a certain point of time, and was chosen for this study. The weaknesses of a cross-sectional study design are difficulties in determining whether exposure (presence of an organic food policy or not in the school) and outcome (pupils' diet) are, in fact, causally related, and whether confounding factors e.g. ethnicity or socioeconomic status, are equally distributed among the groups being compared. For this study it was difficult to assess whether there were other factors than organic versus non organic food policies influencing the children's eating habits.

Three retrospective methods of dietary assessment are in common use in Denmark: *24-hour Recall, Dietary history* and *Food Frequency Questionnaire (FFQ)*. In a 24-hour Recall, the respondents are asked to recall food and drink consumed during the immediately preceding 24 hours. In a Dietary history, the respondents are questioned about "typical" or "usual" food intake and meal patterns in a personal interview of one or two hours with an interviewer trained in the field of food and nutrition. In a FFQ, the respondents are presented with a list of food and required to estimate how often each item is eaten. This method can be used to assess either the respondents' total diet or factors selected for a more specific purpose (Geissler & Powers, 2005).

To investigate general questions, e.g. whether children's diets comply with The Danish Dietary Recommendations, it is necessary to measure their general dietary patterns rather than food intake on single days. A FFQ can be used to measure the children's usual intake over time, as it demands fewer resources than Dietary History, but it still covers a longer period of time in comparison with the 24-hour recall. While the specific focus of this study is on school meals and a FFQ covers the whole day, a variation of the 24-hour recall can supplement the FFQ by indicating if it is the actual food served in schools that makes the difference. Hence, a combination of FFQ and 24 hour recall was used in this study. These two methods can be self-administered or investigated through structured interviews. Self-administered questionnaires cost more and are time efficient, as there is no interviewer present. In addition to the increased efficiency, self-administration eliminates interviewer variability and influence. Adversely, the lack of support for respondents if they have difficulties to understand or answer a question may result in less records because questions will be omitted, or incorrectly answered because questions are misunderstood, or the respondent on purpose gives wrong answers. Problems of "question order effect" may arise as respondents are able to read ahead in the questionnaire. A self-administered, teacher assisted questionnaire completed in the classroom during school hours was judged as the most appropriate for this study. The children are accustomed to the classroom and this approach usually gives fewer problems with low response rates (Bryman, 2004).

3.4 Sampling

The population studied here is Danish school children, and ideally, they should all have participated. As a certain literacy level and motivation are necessary to respond to a questionnaire, we have chosen to study 6th graders, where the pupils are usually 12-13 years old. As the number of schools in Denmark with publicly organised prepared food provision and organic food policy is limited, it is not possible to survey all 6th grade children. Hence, representative schools were selected for "cluster sampling". Using a "two-staged cluster sampling", the school, rather than the individual child, will become the primary sampling unit (Bailey et al., 2005). The classes form secondary and final sampling units, because all pupils in each class will be participating in the study, if they are not absent the day of the study.

The process used to indentify representative schools with and without organic food policy is called "matching" (Bailey et al., 2005). Matching is a way of minimising the risk of bias and avoiding other factors than the one studied that might influence the result. Matching is achieved using characteristics judged in advance to be the most important. In this study, we first identified all schools with a prepared food provision, because meal patterns rather than single food items were the area of interest. The argument for excluding private schools is that eating patterns in private schools may be affected by factors such as religious beliefs (8), e.g. Muslim schools do not serve pork and Jewish schools serve kosher food. A further inclusion criterion is that the school must have a written food and nutrition policy (FNP); otherwise it might be argued that the reason for a potentially healthier menu is the FNP, rather than the organic food policy.

One of the hypotheses of the iPOPY study is that price premium on organic products will exert pressure on meal planners to seek alternatives to expensive foods, thereby growing the likelihood of increasing the vegetable consumption.

It is important not to select too many characteristics by which to match the schools. Further, characteristics for matching should not be very closely associated with exposure (organic food policy or not in the school), since the factors used for matching cannot then be included in the analysis (Bailey et al., 2005). All possible confounding factors, such as gender, socioeconomic group and ethnicity should therefore be identified during the study to assess their neutrality. If they are not neutral, it is possible to control for them.

A questionnaire's content must reflect the objectives of the study. It should be as brief as possible and only include the exact amount and types of questions necessary to provide sufficient information

(Margetts & Nelson, 1997). A good questionnaire design should stimulate recall, motivate respondents to continue and make the questionnaire flow in an orderly fashion. Question sequence is important for creating flow and must therefore also be considered, so that respondents are not required to read questions that do not apply to them (Bryman, 2004). Furthermore the first few questions in the questionnaire should be easy, in order to calm the respondents, allow them to gain confidence and to stimulate their interest (Fathalla & Fathalla, 2004).

The questionnaire (Q) that was used included an introductory letter which explains the procedure, instructs respondents on how to complete the questionnaire correctly and states that participation is voluntary, see Fig 1. The first part of the Q contained questions about age, gender, household composition and cultural background/ethnicity. The main section was divided into a Diet Recall section, a Food Frequency (FF) section, and a section designed specifically for this study referred to as "the Knowledge and Preference"(KP) section". This last section explored the children's knowledge of and preference for selected fruit and vegetables. The FF covered entire days over a six month period and was included to give insight into the children's overall eating patterns, as school meals might also influence overall diet. The Diet Recall was included to study whether the food served at school caused variation among the pupils in eating patterns, and the KP section was included to study the variation in the pupils' diets. The fruits and vegetables in the KP section could have been included in the FF section, but this would have more than doubled the size of the questionnaire. The chosen solution gives insight into how an organic food policy affects knowledge of and preferences for fruits and vegetables, which can have long term significance, as eating habits in childhood are often sustained throughout life (Mikkila, 2005). (Appendix 1).

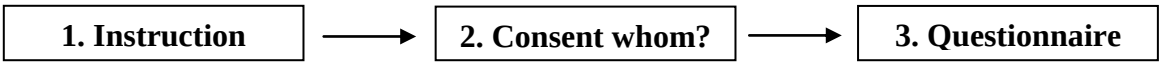

Fig. 1. Contents and sequences in the questionnaire

In addition, a blank page was included on which children who finished early were encouraged to draw so as to not disturb their class mates. The last page of the Q instructed respondents to return the questionnaire to their teacher in a sealed envelope. (Appendix 1).

3.5 Types of questions

The questionnaire was composed primarily of closed questions, except in the background section. The recall section contained a single open question about what the children ate and drank during school hours on the previous day (Appendix 1). This information was used to measure the extent to which the recall questions covered their actual intake.

When answering closed questions the respondent should have the opportunity to choose an "other" option unless it is certain that all possible responses have been offered (Margetts & Nelson, 1997). This option was used in the recall section, where the most common answers were categorised in tables but space was left for additions. In this way the questionnaire also covers more infrequently eaten items (Fig. 2).

C2. Did you eat fruit during your time at school yesterday?

_ Yes
_ No

If yes, what kind of fruit did you eat? How much? *(For example: write 1 if you ate one apple, ½ if you ate half an apple etc.)*

Apple		Pieces
Banana		Pieces
Orange		Pieces
Tangerine		Pieces
Pear		Pieces
Melon		Slice
Fruit salad		Portion
Other fruit (Please specify)		Piece or Portion

Fig. 2. Example of question from the Recall Section (Appendix 1)

3.6 Reuse of questions

It has been chosen to focus on the two most prominent questionnaires in Europe, known as HBSC and "Pro Children", that use children as respondents. HBSC focuses on children's general health and contains only a few questions about diet, whereas Pro Children specifically focuses on fruit and vegetable intake among school children (Haraldsdóttir et al., 2005 & Rasmusen & Due, 2007). These have already been translated into Danish, and previously validated questions can therefore be reused (Haraldsdóttir et al., 2005). Where possible, questions in the present study are therefore cited either from Pro Children or HBSC. Any change in question format may affect their nature and therefore their validity (Margetts & Nelson, 1997).

Fish, fish products and smoothies are not included in Pro Children, but were included in our questionnaire.

As the questionnaire has to be read and the answers written, poor literacy skills had to be taken into consideration. Although children of 10-12 years are generally capable readers, it is expected that up to 15% of Danish school children face difficulty understanding and answering written questions (Andersen & Ottesen, 2002). Hence, the language of the questionnaire was kept simple and plain.

Respondents' understanding of words and terms may differ, resulting on the basis of their answers being broader or narrower than intended by the researcher. It is important to avoid technical terms, choose as precise terms as possible and ensure that a short explanation is added to potentially ambiguous terms. The following is an example of how a single word completely changes a question: In the frequency section of the English version of the Pro Children questionnaire, the children are asked *"How often do you usually eat cooked vegetables?"*. In the Danish version, this is translated to "*Hvor*

ofte plejer du at spise kogte grøntsager?" which is "*How often do you usually eat boiled vegetables?"*. This is different from "*cooked vegetables",* which could also be interpreted as fried, baked, steamed etc. As we want to measure the total intake of vegetables that are not raw, it is more appropriate to use the term *"tilberedte grønsager"* which is *"prepared vegetables"*. As the term *"tilberedte grønsager*" might not be familiar to the children, it must be followed by a short explanation. (Example C5, Appendix 1).

Questions including "not" or similar formulations are open to misinterpretation by the respondents as they can easily miss the word and therefore reply to a question with the opposite meaning than intended. For this reason, questions that include negatives should always be rephrased to a positive format.

Double-barrelled questions are in fact two questions in one, leaving respondents unclear about how to respond and therefore often causing confounding results. More developed cognitive competence is required to remember and answer two questions at the same time. Such questions should be avoided and two or more separate questions asked instead (Andersen & Ottesen, 2002). E.g, in order to enquire how well respondents follow the third Danish Dietary Guideline, "Eat potatoes, rice or pasta, and wholemeal bread – every day", it is necessary to divide these various foods into several questions, rather than requiring the children to answer one question about all four. Double-barrelled questions have been used in the questionnaire, but only about foods that are cognitively classified in the same way, such as wholemeal bread and wholemeal rolls, and fish and fish products.

Leading or loaded questions should be avoided (Margetts & Nelson, 1997), although it is easy to unintentionally indicate what is considered the preferred behaviour because it is so embedded in our thinking. For example, in the sentence in question C2 that reads "*Write 1 if you had one apple, ½ if you ate half an apple etc."*, it would be easy to include the word *"only"* in *"you ate half an apple"*. (Appendix 1).

Long questions are generally inadvisable, although their use is justified in some cases, as they can provide helpful memory cues. However, there is an increased risk of respondents skimming the question, missing its intention and answering it incorrectly.

Answer options must be mutually exclusive, balanced and not loaded, to provide precision and thoroughness (Margetts & Nelson, 1997). In the FF section, the question and answer options are based on the Pro Children questionnaire and controlled for the mentioned details. Although some foods are consumed more frequently than others, the response options remain the same throughout the questionnaire in order to create a feeling of consistency. The researcher must be completely confident that all possible answer options have been included. Failure to do so will result in biased responses which do not reflect the true range of behaviours in the sample and will frustrate subjects' attempts to provide appropriate answers. This problem can be overcome by including an "other–please specify" option (Margetts & Nelson, 1997). This has been used in the background questions, including those answered by the parents (Section 2.7 and Appendix 2). Similarly, in the recall section, where the most usual food items are listed, space has been provided for respondents to list additional foods. This recall section includes an open question, B3: *"Did you eat or drink something during your time at school yesterday?"* Memory of food items are often embedded in other events and the child must recall events of the day to identify the food eaten (Baranowski & Domel, 1994). The answer has therefore been divided into three parts: *"Morning before lunch break", "during lunch break"* and *"afternoon after lunch break"* in order to promote recall. (Appendix 1).

3.7 Data collection from parents / guardians

In the final analysis of this study, it is important to be able to adjust for the respondents' socioeconomic status and therefore to obtain background information about their families. Research has shown that children have problems providing this kind of information; children as old as 15 have great difficulty answering specific questions other than about themselves, including their parents, and should not be required to do so (Olsen, 2006). For this reason it was necessary to develop a brief

questionnaire containing background questions referring to socioeconomic status for the parents. After operationalisation the concept pertains to: Household income, parental educational level, parental occupation and urbanization. The questionnaire (Appendix 2) was given to the parents with a consent form where they agreed that their child could participate in the survey (Appendix 3).

3.8 Questionnaire layout

A self-administered questionnaire must be clear, appealing and should have a lay-out that encourages correct completion (Margetts & Nelson, 1997). Successful layout might enhance response rate and even influence the accuracy of the questionnaire. It is tempting to reduce margins and minimize space between questions in order to make the questionnaire seem shorter and save pages but this may cause the questionnaire to appear cramped and uninviting to the respondent. If questions are too cramped they risk being inadvertently missed by the respondents. Too much space might make the questionnaire bulky and is therefore inadvisable. However, sometimes blank space on a page is unavoidable, in order to keep questions together; confusion may occur should a question become divided. Typography is also an essential part of the layout and it is important that the selected typographies are used consistently (Bryman, 2004). In this study, we chose "Arial" font size 11, just as in the current report. All questions were enhanced in "bold" type, explanations were indicated in "italics" and all answer options were kept in "Arial normal". Headlines to indicate every new section were in green, "Arial", "bold" and size 16.

Before printing, it must be decided whether the questionnaire should be printed single or double sided. The advantage of double sided printing is a reduction in the number of paper sheets, but it might appear messy and may cause context effects as respondents are more inclined to read ahead in the questionnaire. Whichever the chosen layout, it needs to be the same in both pilot and final study. Here, we have chosen a single sided layout.

3.9 Ethical considerations

All research should have a clear purpose, to avoid respondents being subjected to an unnecessary process (Fathalla & Fathalla, 2004). The researcher must also bear responsibility for the promotion and dissemination of the study results. Precaution must be taken to protect the rights of the children, and hence a consent form to allow participation, signed by the parents, was included in this study (Appendix 3). The introduction to this consent informed the families about of the purpose of the study, explained about confidentiality and emphasised that participation was voluntary. Parents may prefer not to give the children and teachers insight to their income, and were provided with a coded return envelope that was matched to their children's questionnaire. This procedure ensured that no sensitive material can be traced back to the participants.

3.10 Pretesting questionnaires

Expert Evaluations and Think Aloud Interviews were used to test the questionnaires. The questionnaire was first evaluated in house in the National Food Institute by colleagues with knowledge and experience in designing questionnaires about food habits and using children as respondents.

After the questionnaire was adjusted on the advice of colleagues it needed to be tested on "the real experts" - the children, to discover exactly what works in reality. In Think Aloud Interviews, test-respondents are asked to think aloud while completing the questionnaire while the researcher observes, takes notes and reminds respondents to keep talking if they should lapse into silence (Olsen, 2006). Questions can be asked during the interview to clarify how well they understand selected parts of the questionnaire. Essentially, this interview style demands that respondents are given free room to think aloud without interruption. However, in order to retain focus on those particular areas which might be problematic, a concise interview guide was prepared. (Appendix 5).

The Think Aloud Interviews were initially conducted with four children within the sampling frame. The test began with an observation of whether the children actually read the **instruction letter** at the beginning of the questionnaire. They all did, although the two boys only skimmed the text. That all the children to some extent read the text may be because they were under observation and wanted to make a good impression. This result might therefore be biased.

The **ability to transfer ID number** correctly was also tested. No problems were observed, although it is important that the children are instructed to do so. This must therefore be emphasised in the letter to the teachers.

The fruit and yoghurt based drink "smoothie" revealed to be a popular snack among children and two of the children did not **know where to place** it, due to it being partly fresh fruit and partly dairy product (milk or yoghurt). I inquired about this after the test and one student explained that making smoothies was common among her classmates. Because this might contribute significantly to the children's fruit intake, it was decided to include it as an extra question in the frequency section.

In the recall section, where the children were required to fill in what they had been drinking using the **measure** "glasses", they had trouble deciding on how many, as they tend to drink water out of 500 ml bottles. A short explanation has been added, explaining that one bottle corresponds to 2½ "glasses".

None of the children doing the test were able to complete the question on milk intake frequency as intended. They ticked the column of the milk they drank and left the other column blank. The children suggested that the question should be divided into four, similar to the remaining questions in the frequency section, but as this would add another page to the questionnaire, the explanation of the question was improved instead to promote correct completion.

Unnecessary explanations might cause confusion, and the "Think Aloud Interviews" revealed this in three places. In the frequency section, *"How often do you usually eat fresh fruit?"* directly cited from the validated Pro Children questionnaire, caused confusion. To the researcher, this question appears simple, but the adjective "fresh" confused all four participants. Probably, Pro Children underlines "fresh" to avoid measuring any intake of preserved fruit or jam. For the children however, the word "fresh" pertains to how long the fruit has been in the fruit bowl at home, not to whether it is prepared in any way. This was exemplified when one of the boys said "*I don't always know how fresh it is, but I don't want to eat it if it is too old*". The other three children just asked while filling out the questionnaire "*its just fruit, right?*" and "*they just mean normal fruit, right?*" indicating that their term for fresh fruit is just "fruit". In the C-section, the adjective "green" added to peas and beans to help them understand, caused confusion. Beans without the word "green" could have been understood as legumes that the children know from dishes such as chilli con carne, but in the children's vocabulary, "green beans" and "green peas" are simply beans and peas.

The questions for examining ethnicity were "*Are you born in Denmark*?", "*In which country is your mother born?*", "*In which country is your father born?*" and "*Which language do you speak most often at home?*" These questions are all taken directly from Pro Children. Three of the test children expressed some irritation that they should write the answer to the country questions themselves, rather than ticking a box. It was subsequently decided to give both open and closed answer options to these questions, so that children with parents of Danish origin and/or who primarily speak Danish at home could tick a box whereas other children had to write the answer. (Fig. 3). It can be discussed whether this discriminates children with ethnic backgrounds other than Danish, especially because these may have more difficulty completing a questionnaire in Danish designed by researchers who are mostly familiar with traditional Danish food.

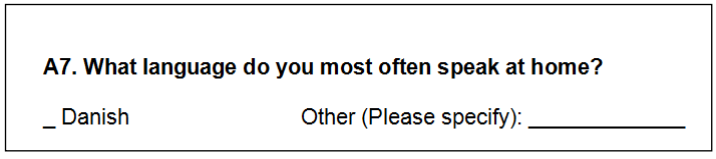

Fig. 3. Example of question about ethnicity (Appendix 1)

It was important to test question B3 (Appendix 1), an open question in which the children were asked to write in keywords on what they ate and drank during school hours the previous day and to indicate where they obtained such food and drink: from home, bought at school or bought outside the school. To promote recall they were required to give their answer in three parts: before lunch break, during lunch break and after lunch break. As this was a rather complex question it was important to test if they understood what was required of them. Three of the children did not understand that the question referred only to intake during school hours, and started to write about their breakfast. Hence, clarification was required and an extra explanation was added. One boy did not indicate where the food came from and, when asked, explained that he forgot to read the text. Two of the children did not know that drink was included, and a reminder was placed in brackets at the end of each category.

The answer options in the knowledge table were "know" and "don't know", but the test revealed that another option was needed because the children were distinguishing between "know" and "have heard of". "Have heard of", for this reason, was included as a third answer option.

The interview was also used to test if they actually knew the fruit and vegetables for which they gave positive answers in the questionnaire. This was done by showing the children pictures of the different fruits and vegetables from the questionnaire and asking them to name them. There was an average 95% agreement on answers pertaining to fruit, but only 81% on those pertaining to vegetables.

The children took between 30 and 40 minutes to complete the questionnaire in a situation where they were required to think aloud and where it was sometimes necessary for me to interrupt with clarifying questions. After they completed the test we continued with the picture cards and further general questions, so the total interview lasted for approximately 45 minutes. The children thought that the time passed quickly, which indicates that children of this age can retain focus and concentration for the time it takes to complete the questionnaire. The impact of the sequence of the questionnaire was also demonstrated. When the pupils completed the KP section, they became more energetic, and two of them declared outright that it was fun to participate in that part of the questionnaire. This may partly have been due to a variation of tasks, but also because of pride by knowing many of the fruit and vegetables and understanding that this knowledge was desirable.

3.11 Importance of pilot studies

The term "pilot studies" refers to mini versions of a full-scale study that are a crucial element of a good study design (Margetts & Nelson, 1997). In contradiction to the other pre-test methods, piloting is not solely concerned with ensuring that questions operate well, but is also a method with which to test whether the research instrument as a whole functions as intended (Bryman, 2004). It is therefore important that a pilot study is administered in exactly the same way as the final study (Margetts & Nelson, 1997).

The Pro Children questionnaire was tested in four classes distributed between two schools, which also seem appropriate and manageable for this study (Haraldsdóttir et al. 2005). A pilot study should not use respondents who are going to participate in the final study (Bryman, 2004). In our case, the Q was tested on 4 pupils at a school without organic food policies that will not be included in the final study.

4. Discussion

To be successful, a questionnaire must be both valid and reliable. In order to be valid, it must measure precisely what the researchers aim to measure. If it then produces consistent and accurate results independent of the respondents' individual abilities, it can also be said to be reliable. This study has investigated the various aspects involved in creating a questionnaire, and some of the problems which arose will be discussed in this chapter.

To ensure that the text was easy to understand, the Q's readability could have been tested by the LIX Formula. This tool uses the average number of words per sentence plus the percentage of "long words" (= words > 6 letters) to calculate and classify readability (Björnsson, 1971). However, the LIX Formula was inappropriate for our purpose because a commonly used 'long word' such as Da. "spisefrikvarter"/ "lunch break" would indicate an increased level of difficulty although it is a familiar word to the children, whereas short adjectives such as "green" and "fresh" created great confusion. This indicates that context and the way sentences are formulated have more impact on the children's understanding than the length of individual words.

The questionnaire's reliability depends on appropriate choice of terms and categories, especially when the respondents are children. For example, Preoperational children (Table 1) usually distinguish between sweet and non-sweet foods, whereas children at the Concrete operational level tend to focus on the origin of food, i.e. plant versus animal, and the degree of processing (Baranowski & Domel, 1994). It can be discussed whether chosen terms are appropriate; question C10 deals with what is commonly known as "fast food". This has negative connotations and the colleagues suggested to use the term "small dishes" ("små retter") instead. This may, in turn, affect the validity, as the children may unintentionally skip the question if they are not able to understand its content, subsequently providing a false picture of their actual intake. During the Think Aloud Interview, the children were asked how they would categorise the foods burgers, pita/durum sandwiches, pizza, hotdogs, sausage rolls and french fries. All of them suggested "fast food" and when challenged to think of other terms, some said "unhealthy food" and "fatty foods". When then asked what they understood by "small dishes," in various words they indicated "side dishes". This shows that "small dishes" is probably not the best term to use and that "fast food" may be better. Is it better to use the neutral term "small dishes" as recommended by the colleagues or to use a term familiar to the children? If the children choose to skip the question because they would rather not admit eating unhealthy food, are they not just as likely to skip a question entitled "small dishes" with various unhealthy foods listed underneath? It might be interesting to test whether children of this age group and stage in life actually understand fast food to be negatively loaded or, on the contrary, perceive it to be "cool" and desirable, as they may be at a stage where they emancipate themselves from family traditions and belief systems (Iversen & Holm, 1999).

As described, pictures may be applied to promote understanding. However, they may also be misleading. In the test interviews with the four children, they identified many foods with a specific preparation form in mind that was not represented in the pictures. All the children claimed to know rhubarb, elderberry, cabbage and many root vegetables, but none could recognise them in the pictures. Their subsequent description of beetroot was marinated and in a jar, which explains why they did not recognise the whole beetroot in the picture. There was greater agreement between the answers about fruit than those about vegetables, which may be attributed to fruit more often being consumed fresh and therefore recognisable in its original form. Indeed, those fruits that the children had difficulties identifying were also those fruits that are typically prepared before consumption. Based on these results it was judged that pictures would not increase the validity of the answers.

Another consideration in relation to validity is whether the children are capable of giving reliable estimations of quantity/portion size. This would ensure a more precise and accurate measurement of the children's intake and prevent misleading answers leading to distorted measurement. One child may have eaten sushi twice in a week, which statistically would appear to be more than a child who had eaten a salmon steak or similar once in a week, while the actual intake of fish would be less. A similar inaccuracy might occur in the confectionary question, where one child eating a whole chocolate bar twice a week could statistically appear to eat less chocolate than a child who eats one small piece of chocolate every day. Portion size indication requirement would therefore appear to be beneficial. However, estimation of quantity/portion size is a highly skilled cognitive activity which may cause problems for children. Studies have in fact indicated that most adults, even those with advanced nutritional knowledge, have considerable problems estimating correct quantities (Baranowski & Domel, 1994). Quantity indication has been registered in the recall section, as was done in Pro Children, and it can still be discussed whether adding this in the FFQ will improve the accuracy of the study. If it is added, it will be necessary to test any results in a validation study with appropriate reference methods, where they must be weighed against the importance and accuracy of the information retrieved.

5.Conclusion

The main objective of the study was to test the hypothesis that organic food policies in schools act, either directly or indirectly, as a driver for healthier eating among school children. Studies can be conducted in several ways and it is important to choose a design that will provide valid answers under the given financial and time limits. There are several arguments for using children as respondents, but asking them directly requires special attention, particularly to reading skills and cognitive development. Children in 6th grade, 12-13 years, have been chosen as respondents. As it is not possible to introduce interventions within the framework of the iPOPY project, in which this study was carried out, an analytical observational study design was chosen. The study classes of children will therefore be selected through cluster sampling, where representative schools with prepared food provision and organic food policies will be matched with schools with prepared food provision but without an organic food policy. A cross-sectional retrospective design has been considered sufficient to provide a generalised picture of the children's diet, and a self-administered questionnaire (Q) completed in the classroom during school hours has been chosen as the most appropriate assessment method. The Q's content must be brief due to children's limited concentration and only include the questions necessary to provide sufficient data with which to test the hypothesis. Three different dietary assessment methods were chosen for the questionnaire: Diet Recall, Food Frequency Questionnaire and a study-specific method measuring knowledge of and preference *(KP)* for selected fruits and vegetables. Where possible, questions have been cited from the validated Pro Children questionnaire, although as that survey focuses only on fruits and vegetables, questions must be adjusted to address, more broadly, respondents' eating patterns. The language of both questions and answer options must be simple and plain, to accommodate the needs of poor readers. Answers must be mutually exclusive, balanced and objective. The layout must be clear, appealing and encourage correct completion. Since children as old as 15 have great difficulty answering questions other than about themselves, it has been necessary to develop a brief parent/guardian questionnaire for information on socioeconomic status.

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Appendix 1: Questionnaire children

NR:			

Her skal du overføre nummeret fra svarkuverten

Spørgeskema til skoleelever

iPOPY

National Food Institute

Kære skoleelev April 2008

Vi beder dig hjælpe os med en undersøgelse af skoleelevers spisevaner.
I spørgeskemaets første del, skal du svare på nogle generelle spørgsmål om dig selv og din familie. Herefter bliver du spurgt om, hvad du har spist i skoletiden **i går**. Derefter skal du svare på nogle spørgsmål om, hvad du **plejer** at spise (både i skolen, derhjemme og andre steder) og hvor denne mad plejer at komme fra. Når du besvarer spørgsmål om hvad du plejer at spise, skal du tænke tilbage på de sidste 6 måneder.

Til sidst i undersøgelsen vil du blive præsenteret for en liste med forskellige frugter og grøntsager. Her skal du fortælle os, om du kender de pågældende frugter og grøntsager, og hvor godt du kan lide dem.

Udfyld skemaet tydeligt med en blå eller sort kuglepen. Ved hvert spørgsmål er der angivet, hvordan det skal besvares. Spørgsmålene om hvad du har spist i går, besvares ved at skrive hele eller halve tal (f.eks. 1 eller 2 ½), der svarer til den mængde, du har spist eller drukket i skoletiden i går. De fleste andre spørgsmål besvares, ved blot at sætte et kryds ud for dit svar. Ved nogle få spørgsmål, bliver du bedt om at sætte mere end et kryds. Ved enkelte spørgsmål beder vi dig om selv at skrive dit svar.

Eksempel på besvarelse af spørgsmål om hvad du spiste i går:

C2. Spiste du frugt i skolen i går?

_ Ja
_ Nej

Hvis ja, Hvilken slags frugt? Hvor meget? *(Skriv f.eks. 1, hvis du spiste et æble, ½ hvis du spiste et halvt osv.)*

Æble		Stk.
Banan		Stk.
Appelsin		Stk.
Mandarin		Stk.
Pære		Stk.
Melon		Skive
Frugtsalat		Portion
Anden frugt (Skriv hvad)		Stk. eller portion

Spørgeskemaet er anonymt, så du skal ikke skrive dit navn på.
Når du har besvaret spørgeskemaet, beder vi dig lægge det i kuverten, lukke kuverten og give den lukkede kuvert til din lærer. Ingen på din skole vil få dine svar at se.

Vi håber, at du har lyst til at hjælpe os, men det er frivilligt at deltage i undersøgelsen.
Hvis du ikke ønsker at besvare spørgeskemaet, beder vi dig levere det tilbage i kuverten ubesvaret.

Tak for din hjælp!

A: Først nogle spørgsmål om dig

A1. Hvornår er du født? *(eks. 05.04.1996)*

_ _ . _ _ .19 _ _

A2. Er du pige eller dreng?

_ Pige
_ Dreng

A3. Bor du sammen med begge dine forældre?
(Hvis du bor to steder, kan du sætte to krydser)

_ Sammen med min mor som bor uden partner
_ Sammen med min far, som bor uden partner
_ Sammen med min mor og hendes nye mand/kæreste
_ Sammen med min far og hans nye kone/kæreste
_ Sammen med både min mor og far hele tiden
_ Andre voksne (*Skriv hvem)*:

_____
_

A4. Er du født i Danmark?

_ Ja
_ Nej

A5. Hvilket land er din mor født i?

_ Danmark Andet (Skriv hvor): _____

A6. Hvilket land er din far født i?

_ Danmark Andet (Skriv hvor): _____

A7. Hvilket sprog taler du for det meste derhjemme?

_ Dansk Andet (Skriv hvilket eller hvilke sprog): _____

B: Spørgsmål om hvad du spiste I GÅR mens du var i skole

B1. Hvilken dag var det i går? ***(sæt 1 kryds)***

_ Mandag
_ Tirsdag
_ Onsdag
_ Torsdag

B2. Spiste eller drak du noget, mens du var i skole i går? ***(sæt 1 kryds)***
_ Ja
_ Nej

Hvis nej, gå til spørgsmål om, hvad du plejer at spise s. 11

B3. Hvis ja, hvad var det og hvor var det fra? *(skriv kun stikord som f.eks. sandwich, yoghurt osv. og i parentes bagefter, hvor du havde fået maden fra (h) = hjemmefra, (s) = købt på skolen, (b) = købt uden for skolens område eller (a) = andre steder fra)*

Eksempel: 1 æble(h) og 1 bolle (s)

Formiddag i skolen, før spisefrikvarteret (husk drikkevare):

Frokost, i spisefrikvarteret (husk drikkevare):

Efter spisefrikvarteret, mens du stadig var i skole (husk drikkevare):

C: Her skal du uddybe hvad du spiste i skoletiden I GÅR

Spørgsmålene om hvad du har spist i går, besvares ved at sætte kryds ved enten "ja" eller "nej", og skrive hele eller halve tal (f.eks. 1 eller 2 ½), der svarer til den mængde, du har spist eller drukket i skoletiden i går. Du kan også tilføje andet nederst i skemaet.

C1. Drak du juice i skolen i går?
_ Ja
_ Nej

Hvis ja,
Hvor meget? *(Skriv f.eks. 1 hvis du drak et glas, ½ hvis du drak et halvt glas osv.)*

Juice		Glas

C2. Spiste du frugt i skolen i går?
_ Ja
_ Nej

Hvis ja,
Hvilken slags frugt? Hvor meget? *(Skriv f.eks. 1 hvis du spiste et æble, ½ hvis du spiste et halvt osv.)*

Æble		Stk.
Banan		Stk.
Appelsin		Stk.
Mandarin		Stk.
Pære		Stk.
Melon		Skive
Frugtsalat		Portion
Anden frugt (Skriv hvad)		Stk. eller portion

C3. Spiste du salat i skolen i går?
_ Ja
_ Nej

Hvis ja,
Hvad slags salat? Hvor meget? (Skriv f.eks. 1 hvis du spiste en portion, ½ hvis du spiste en halv portion osv.*)*

Blandet salat		Portion
Grønsalat		Portion
Tomatsalat (Kun med tomater)		Portion
Salat med agurker (Kun med agurker)		Portion
Revne grøntsager/råkost		Portion
Anden salat (skriv hvilken)		Portion

C4. Spiste du andre rå grøntsager i skolen i går?
_ Ja
_ Nej

Hvis ja,
Hvilke slags grøntsager? Hvor meget? *(Skriv f.eks. 1 hvis du spiste en tomat, ½ hvis du spiste en halv osv.)*

Tomat		Stk.
Agurkestykke		Stk.
Gulerod		Stk.
Andre rå grøntsager (Skriv hvilke)		Stk.

C5. Spiste du grøntsagssuppe i skolen i går?
_ Ja
_ Nej

Hvis ja,
Hvor meget? *(Skriv f.eks.1 hvis du spiste en portion, ½ hvis du spiste en halv portion osv.)*

Hvor meget		Portion

C6. Spiste du tilberedte grøntsager i skolen i går? *(kartofler skal **ikke** tælles med. Tilberedte grønsager inkluderer kogte, dampede, stegte, grillede og bagte grøntsager.)*
_ Ja
_ Nej

Hvis ja,
Hvilke slags grøntsager? Hvor meget? *(Skriv f.eks. 1 hvis du spiste en portion, ½ hvis du spiste en halv portion osv.)*

Blandede grøntsager		Portion
Grønne ærter		Portion
Majs		Portion
Grønne bønner		Portion
Blomkål		Portion
Broccoli		Portion
Grøntsager i sammenkogte retter		Portion
Andre kogte grøntsager (skriv hvilke)		Portion

C7. Spiste du fisk i skolen i går?
_ Ja
_ Nej

Hvis ja,
Hvor meget? *(Skriv f.eks. 1 hvis du spiste en portion, ½ hvis du spiste en halv portion osv.)*

Fiskepinde		Stk.
Fiskefrikadeller		Stk.
Fiskefileter		Stk.
Makrel i tomat på brød		Skiver
Tun på brød		Skiver
Anden slags fisk eller fiskepålæg (skriv hvilken slags)		Mængde

C8. Spiste du brød i skolen i går?
_ Ja
_ Nej

Hvis ja,
Hvilke slags? Hvor meget? *(Skriv f.eks. 1 hvis du spiste en skive/stk., ½ hvis du spiste en halv skive/stk. osv.)*

Lyst brød		Skive
Grovbrød		Skive
Rugbrød		Skive
Grovbolle		Stk.
Pitabrød		Stk.
Croissant eller tebirkes		Stk.
Andet brød (skriv hvilken slags)		Skive/stk.

C9. Spiste du chokolade, slik, is, kage eller snacks i skolen i går?
_ Ja
_ Nej

Hvis ja,
Hvilke slags? Hvor meget? *(Skriv f.eks. 1 hvis du spiste en håndfuld / stk., ½ hvis du spiste en halv håndfuld / stk. osv.)*

Slik		Håndfuld
Chokolade		Håndfuld
Flødeboller		Stk.
Chips		Håndfuld
Peanuts, pistacienødder mm.		Håndfuld
Popcorn		Håndfuld
Sodavandsis		Stk.
Flødeis		Stk./skive

Mælkesnitte		Stk.
Müslibar		Stk.
Ostehaps, ostestang, ostebjælke		Stk.
Skærekage, tørkage, romkugler		Stk./skive
Wienerbrød		Stk.
Andet (Skriv hvilken slags)		Mængde

C10. Spiste du små retter i skolen i går? *(F.eks. burgere, hotdogs, pølsebrød, pizza, pomfritter)*
_ Ja
_ Nej

Hvis ja,
Hvilke slags? Hvor meget? *(Skriv f.eks. 1 hvis du spiste en portion / stk., ½ hvis du spiste en halv portion / stk., skriv mængden under hvor du fik maden fra)*

	Hjemmefra	Fra skolen	Købt udenfor skolens område	
Burger				Stk.
Pitabrød, durum mv.				Stk.
Pizza				Stk.
Hotdog/fransk hotdog				Stk.
Pølsehorn				Stk.
Pomfritter				Portion
Andet (Skriv hvilken slags)				Portion/stk.

C11. Spiste eller drak du nogen mejeriprodukter i skolen i går?
_ Ja
_ Nej

Hvis ja,
Hvilke slags mejeriprodukter? Hvor meget? *(Skriv f.eks. 1 glas / stk. / portion, hvis du spiste et mejeriprodukt, ½ hvis du spiste et halvt glas / stk. / portion mejeriprodukt osv.)*

Skummetmælk/kærnemælk		Glas
Minimælk		Glas.
Letmælk		Glas
Sødmælk		Glas
Drikke yoghurt /cultura		Stk.
Milkshake		Glas
Kakao/chokolademælk		Glas
Yoghurt		Stk.
Andet (Skriv hvad)		Stk. glas eller portion

C12. Drak du andet end juice og mælkeprodukter i skolen i går?
_ Ja
_ Nej

Hvis ja,
Hvad og hvor meget? (*Skriv f.eks. 1 hvis du drak et glas, ½ hvis du drak et halvt glas osv. -en ½ liters flaske svarer til 2 ½ glas)*

Vand		Glas
Sodavand		Glas
Saftevand		Glas
Andre drikkevarer (Skriv hvad)		Glas

D: Spørgsmål om hvad du PLEJER at spise

*På de følgende sider skal du svare på nogle spørgsmål om, hvad du **plejer** at spise, både i skolen, derhjemme og andre steder. Når du besvarer spørgsmål om hvad du plejer at spise, skal du tænke tilbage på de sidste 6 måneder.*

D1. Hvor ofte plejer du at købe mad på skolen? *(sæt kun et kryds)*
_ Aldrig
_ Mindre end 1 dag om ugen
_ 1 dag om ugen
_ 2-4 dage om ugen
_ Hver dag, en gang om dagen
_ Hver dag, to gange om dagen
_ Hver dag, mere end to gange om dagen

D2. Hvor ofte plejer du at spise mad i skolen, som du har haft med hjemmefra? *(sæt kun et kryds)*
_ Aldrig
_ Mindre end 1 dag om ugen
_ 1 dag om ugen
_ 2-4 dage om ugen
_ Hver dag, en gang om dagen
_ Hver dag, to gange om dagen
_ Hver dag, mere end to gange om dagen

D3. Hvor ofte plejer du at købe mad uden for skolens område i skoletiden? *(sæt kun et kryds)*
_ Aldrig
_ Mindre end 1 dag om ugen
_ 1 dag om ugen
_ 2-4 dage om ugen
_ Hver dag, en gang om dagen
_ Hver dag, to gange om dagen
_ Hver dag, mere end to gange om dagen

D4. Hvor ofte plejer du at springe frokosten over når du er i skole? *(sæt kun et kryds)*
_ Aldrig
_ Mindre end 1 dag om ugen
_ 1 dag om ugen
_ 2-4 dage om ugen
_ Hver dag

D5a. Hvor ofte plejer du at spise frisk frugt? *(sæt kun et kryds)*
_ Aldrig
_ Mindre end 1 dag om ugen
_ 1 dag om ugen
_ 2-4 dage om ugen
_ 5-6 dage om ugen
_ Hver dag, en gang om dagen
_ Hver dag, to gange om dagen
_ Hver dag, mere end to gange om dagen

D5b. Hvor ofte plejer du at drikke smoothies? *(sæt kun et kryds)*
_ Aldrig
_ Mindre end 1 dag om ugen
_ 1 dag om ugen
_ 2-4 dage om ugen
_ 5-6 dage om ugen
_ Hver dag, en gang om dagen
_ Hver dag, to gange om dagen
_ Hver dag, mere end to gange om dagen

D6. Hvor ofte plejer du at spise salat eller revne grøntsager / råkost? *(sæt kun et kryds)*
_ Aldrig
_ Mindre end 1 dag om ugen
_ 1 dag om ugen
_ 2-4 dage om ugen
_ 5-6 dage om ugen
_ Hver dag, en gang om dagen
_ Hver dag, to gange om dagen
_ Hver dag, mere end to gange om dagen

D7. Hvor ofte plejer du at spise kartofler? *(sæt kun et kryds)*
_ Aldrig
_ Mindre end 1 dag om ugen
_ 1 dag om ugen
_ 2-4 dage om ugen
_ 5-6 dage om ugen
_ Hver dag, en gang om dagen
_ Hver dag, to gange om dagen
_ Hver dag, mere end to gange om dagen

D8. Hvor ofte plejer du at spise tilberedte grøntsager? *(Sæt kun et kryds, kartofler skal **ikke** tælles med. Tilberedte grøntsager inkluderer kogte, dampede, stegte, grillede og bagte grøntsager.)*
_ Aldrig
_ Mindre end 1 dag om ugen
_ 1 dag om ugen
_ 2-4 dage om ugen
_ 5-6 dage om ugen
_ Hver dag, en gang om dagen
_ Hver dag, to gange om dagen
_ Hver dag, mere end to gange om dagen

D9. Hvor ofte plejer du at drikke frugtjuice? *(F.eks. appelsinjuice eller blandet frugtjuice*, *sæt kun et kryds)*
_ Aldrig
_ Mindre end 1 dag om ugen
_ 1 dag om ugen
_ 2-4 dage om ugen
_ 5-6 dage om ugen
_ Hver dag, en gang om dagen
_ Hver dag, to gange om dagen
_ Hver dag, mere end to gange om dagen

D10. Hvor ofte plejer du at spise fisk eller fiskepålæg? *(Sæt kun et kryds)*
_ Aldrig
_ Mindre end 1 dag om ugen
_ 1 dag om ugen
_ 2-4 dage om ugen
_ 5-6 dage om ugen
_ Hver dag, en gang om dagen
_ Hver dag, to gange om dagen
_ Hver dag, mere end to gange om dagen

D11. Hvor ofte plejer du at spise lyst brød? *(f.eks. franskbrød, toastbrød, bolle, ciabattabolle -sæt kun et kryds)*
_ Aldrig
_ Mindre end 1 dag om ugen
_ 1 dag om ugen
_ 2-4 dage om ugen
_ 5-6 dage om ugen
_ Hver dag, en gang om dagen
_ Hver dag, to gange om dagen
_ Hver dag, mere end to gange om dagen

D12. Hvor ofte plejer du at spise grovbrød eller grovboller? *(Sæt kun et kryds)*
_ Aldrig
_ Mindre end 1 dag om ugen
_ 1 dag om ugen
_ 2-4 dage om ugen
_ 5-6 dage om ugen
_ Hver dag, en gang om dagen
_ Hver dag, to gange om dagen
_ Hver dag, mere end to gange om dagen

D13. Hvor ofte plejer du at spise rugbrød? *(Sæt kun et kryds)*
_ Aldrig
_ Mindre end 1 dag om ugen
_ 1 dag om ugen
_ 2-4 dage om ugen
_ 5-6 dage om ugen
_ Hver dag, en gang om dagen
_ Hver dag, to gange om dagen
_ Hver dag, mere end to gange om dagen

D14. Hvor ofte plejer du at spise slik eller chokolade? *(Sæt kun et kryds)*
_ Aldrig
_ Mindre end 1 dag om ugen
_ 1 dag om ugen
_ 2-4 dage om ugen
_ 5-6 dage om ugen
_ Hver dag, en gang om dagen
_ Hver dag, to gange om dagen
_ Hver dag, mere end to gange om dagen

D15. Hvor ofte plejer du at drikke sukkersødede drikke? *(F.eks. cola, sodavand, ice tea, saftevand, sæt kun et kryds)*

_ Aldrig
_ Mindre end 1 dag om ugen
_ 1 dag om ugen
_ 2-4 dage om ugen
_ 5-6 dage om ugen
_ Hver dag, en gang om dagen
_ Hver dag, to gange om dagen
_ Hver dag, mere end to gange om dagen

D16. Hvor ofte plejer du at spise kage? *(Sæt kun et kryds)*

_ Aldrig
_ Mindre end 1 dag om ugen
_ 1 dag om ugen
_ 2-4 dage om ugen
_ 5-6 dage om ugen
_ Hver dag, en gang om dagen
_ Hver dag, to gange om dagen
_ Hver dag, mere end to gange om dagen

D17. Hvor ofte plejer du at spise chips eller popcorn? *(Sæt kun et kryds)*

_ Aldrig
_ Mindre end 1 dag om ugen
_ 1 dag om ugen
_ 2-4 dage om ugen
_ 5-6 dage om ugen
_ Hver dag, en gang om dagen
_ Hver dag, to gange om dagen
_ Hver dag, mere end to gange om dagen

D18. Hvor ofte plejer du at drikke mælk? *(Sæt **4 krydser**, et for **hver** af mælketyperne)*

	Skummetmælk	Minimælk	Letmælk	Sødmælk
Aldrig				
Mindre end 1 dag om ugen				
1 dag om ugen				
2-4 dage om ugen				
5-6 dage om ugen				
Hver dag, en gang om dagen				
Hver dag, to gange om dagen				
Hver dag, mere end to gange om dagen				

D19. Hvor ofte plejer du at spise små retter (købt uden for skolens område)? *(F.eks. burgere, hotdogs, pølsebrød, pizza, pomfritter, sæt kun et kryds)*

_ Aldrig
_ Mindre end 1 dag om ugen
_ 1 dag om ugen
_ 2-4 dage om ugen
_ 5-6 dage om ugen
_ Hver dag, en gang om dagen
_ Hver dag, to gange om dagen
_ Hver dag, mere end to gange om dagen

D20. Hvor ofte plejer du at drikke vand? *(Sæt kun et kryds)*

_ Aldrig
_ Mindre end 1 dag om ugen
_ 1 dag om ugen
_ 2-4 dage om ugen
_ 5-6 dage om ugen
_ Hver dag, en gang om dagen
_ Hver dag, to gange om dagen
_ Hver dag, mere end to gange om dagen

E: Spørgsmål om hvilke grøntsager du kender og hvilke du godt kan lide

E1. Her er en liste over forskellige grøntsager. Sæt først kryds ved om du kender eller ikke kender den. Hvis du kender grøntsagen skriv herefter hvor godt du godt kan lide den.

Kender du denne grøntsag? **Hvor godt kan du lide denne grøntsag?**

Grøntsager:	Kender	Har hørt om	Kender jeg ikke	Virkelig godt lide	Nogenlunde lide	Ikke så godt lide	Slet ikke lide	Har ikke smagt	Ved ikke
Tomater									
Agurker									
Salat									
Peberfrugt									
Radiser									
Fennikel									
Rødkål									
Hvidkål									
Spinat									
Porrer									
Jordskokker									
Grønne bønner									
Løg									
Gulerødder									
Broccoli									
Blomkål									
Grønne ærter									
Squash									
Auberginer									
Hokkaido-Græskar									
Pastinakker									
Persillerødder									
Rodselleri									
Bladselleri									
Rødbeder									
Rosenkål									
Grønkål									
Savojkål									
Kålrabi									
Majroer									
Skorzonerod									

F: Spørgsmål om hvilke bær og frugter du kender og hvilke du godt kan lide

F1. Her er en liste over forskellige frugter og bær. Sæt først kryds ved om du kender eller ikke kender den. Hvis du kender frugten skriv herefter hvor godt du godt kan lide den.

Kender du denne frugt? **Hvor godt kan du lide denne frugt?**

Frugter:	Kender	Har hørt om	Kender jeg ikke	Virkelig godt lide	Nogenlunde lide	Ikke så godt lide	Slet ikke lide	Har ikke smagt	Ved ikke
Abrikos									
Ananas									
Ananaskirsebær									
Appelsin									
Banan									
Blomme									
Blåbær									
Brombær									
Fersken									
Granatæble									
Grapefrugt									
Hindbær									
Honningmelon									
Hyldebær									
Jordbær									
Kirsebær									
Kiwi									
Klementin									
Mango									
Nektarin									
Pomelo									
Pære									
Rabarber									
Ribs									
Solbær									
Stikkelsbær									
Sharon/kakifrugt									
Vandmelon									
Vindrue									
Æble									

Tak for din hjælp

Læg venligst det besvarede spørgeskema i kuverten, luk den og giv den til din lærer.

Hvis du har tid til overs før frikvarteret kan du tegne en frugt eller grøntsag fra skemaet f.eks. en sej selleri, en pjattet porre eller en gakket gulerod:

Appendix 2: Questionnaire parents

Udfyldes af forældre/værge:

ID.NR			

A8. Er du?
(Sæt ét kryds)
□ Mand □ Kvinde

A9. Hvad er dit postnummer?

A10. Hvad er din længste gennemførte uddannelse?
(Sæt ét kryds)

□ Folkeskole, Mellemskole, Realskole
□ Gymnasial uddannelse (inkl. HF, HH, HTX og studenterkursus)
□ Erhvervsfaglig uddannelse
□ Kort videregående uddannelse (under 3 år)
□ Mellemlang videregående uddannelse / Bacheloruddannelse (3-4 år)
□ Lang videregående uddannelse (over 4 år)
□ Andet (angiv venligst):
_____

A11. Hvad er din nuværende beskæftigelse?
(Sæt ét kryds)
□ Selvstændig erhvervsdrivende
□ Medarbejdende ægtefælle
□ Lønmodtager fuld tid (mindst 32 timer ugentligt)
□ Lønmodtager på deltid / nedsat tid
□ Arbejdsløs
□ På orlov
□ Under uddannelse
□ Efterlønsmodtager, pensionist, førtidspensionist
□ Andet (angiv venligst): _____

A12. Hvor stor var husstandens samlede indkomst sidste år før skat og andre fradrag er trukket fra?
(Ved husstand forstår du dig selv, din ægtefælle/samlever og hjemmeboende børn. Sæt ét kryds)
□ Under 99.000 kr.
□ 100.000 – 199.999 kr.
□ 200.000 – 249.999 kr.
□ 250.000 – 299.999 kr.
□ 300.000 – 349.999 kr.
□ 350.000 – 399.999 kr.
□ 400.000 – 449.999 kr.
□ 450.000 – 499.999 kr.
□ 500.000 – 549.999 kr.
□ 550.000 – 599.999 kr.
□ 600.000 – 699.999 kr.
□ 700.000 – 799.999 kr.
□ 800.000 kr. eller derover
□ Vil ikke svare
□ Ved ikke
Kom dette skema i svarkuverten og returner det sammen med tilladelsen til at dit barn må deltage i undersøgelsen. Mange tak for hjælpen.

Appendix 3: Letter to parents

Fødevareinstituttet april 2008

Må vi spørge dit barn om spisevaner?
Selvom danske børn og unge altovervejende er sunde og raske, viser Fødevareinstituttet DTUs kostundersøgelser, at mange børn spiser for meget slik og drikker for meget sodavand. Samtidig spiser børn og unge ikke nok frugt og grønt. I den seneste tid er der kommet fokus på skolemadens betydning for børns sundhed, men der er stadig brug for mere viden på området. I den forbindelse indgår Fødevareinstituttet i øjeblikket i et internationalt forskningsprojekt iPOPY (Innovative Public Organic Procurement for Youth / Innovativ Offentlige Økologiske Fødevareindkøb til Unge www.ipopy.coreportal.org/?page_id=1). Formålet med denne undersøgelse er, at belyse sammenhængen mellem økologisk forsyning og ernæring i forbindelse med skolemadsordninger.

Ud fra ovenstående er Fødevareinstituttet interesserede i tilladelse til, at lade dit barn deltage i en spørgeskemaundersøgelse omkring spisevaner, herunder spisning i skolen. Spørgeskemaet udfyldes i skoletiden og det er frivilligt at deltage. Udover spørgsmål til barnet, indeholder undersøgelsen også nogle få spørgsmål til forældre/værge. Disse spørgsmål findes i skemaet "Udfyldes af forældre/værge", som du venligst bedes udfylde og returnere i den vedlagte svarkuvert.

Resultaterne af undersøgelsen vil være anonymiserede og vil derfor ikke indeholde personhenførbare oplysninger. De returnerede tilladelser vil blive opbevaret sikkert indtil rapporten er færdig, hvorefter de vil blive destrueret. Eventuelle spørgsmål til undersøgelsen kan rettes til Bent E. Mikkelsen (bem@food.dtu.dk)

Elever der har tilladelse til at deltage i undersøgelsen bedes medbringe nedenstående blanket, underskrevet af forældre/værge, samt svarkuvert indeholdende det udfyldte forældre/værge-skema senest d. xx.xx 2008.

På forhånd tak for hjælpen.
Med venlig hilsen

Seniorforsker Bent E. Mikkelsen
Fødevareinstituttet, DTU
Tlf.: 25 38 43 66

Tilladelse til deltagelse i spørgeskemaundersøgelse

□ Det tillades hermed at mit barn _____deltager i en spørgeskemaundersøgelse i forbindelse med forskningsprojekt iPOPY (Innovative Public Organic Procurement for Youth / Innovativ Offentlige Økologiske Fødevareindkøb til Unge), der gennemføres af Fødevareinstituttet / DTU.

□ Jeg ønsker **ikke** at mit barn _____ deltager i undersøgelsen.

Appendix 4: Interview Guide for Think Aloud interview

Test af spørgeskema til skoleelever

Kan IP nummeret overføres korrekt?

Læses introduktionen?

Virker C2-3 efter hensigten, skal de læse beskrivelsen flere gange?
(Eksempel: 1 æble(h) og 1 bolle (s))?

Giver det sig selv, at man må udfylde flere emner i recall delen?

Et det forståeligt hvad tilberedte grøntsager er? Ved de at f.eks. flåede tomater og løg i lasagne hører med? Ville det være bedre hvis der var eksempler?

Er det forståeligt at det er fiskepålæg på antal skriver, der skal angives?

Hvad kaldes: Burgere, hotdogs, pølsebrød, pizza, pitabrød, pomfritter tilsammen? Og spiser du eller dine kammerater andre lignende retter end de nævnte der hører under denne kategori?

Hvor lang tid tager det at udfylde skemaet?

Er der nogen steder du ikke forstod hvad du skulle?

Øvrige bemærkninger undervejs:

Appendix 5: Test template - knowledge about food & nutrition

Kender du denne grøntsag?

Grøntsager:	Kender	Kender jeg ikke
Tomater		
Agurker		
Salat		
Peberfrugt		
Radiser		
Fennikel		
Rødkål		
Hvidkål		
Spinat		
Porrer		
Jordskokker		
Grønne bønner		
Løg		
Gulerødder		
Broccoli		
Blomkål		
Grønne ærter		
Squash		
Auberginer		
Hokkaido-Græskar		
Pastinakker		
Persillerødder		
Rodselleri		
Bladselleri		
Rødbeder		
Rosenkål		
Grønkål		
Savojkål		
Kålrabi		
Majroer		
Skorzonerod		

Kender du denne frugt?

Frugter:	Kender	Kender jeg ikke
Abrikos		
Ananas		
Ananaskirsebær		
Appelsin		
Banan		
Blomme		
Blåbær		
Brombær		
Fersken		
Granatæble		
Grapefrugt		
Hindbær		
Honningmelon		
Hyldebær		
Jordbær		
Kirsebær		
Kiwi		
Klementin		
Mango		
Nektarin		
Pomelo		
Pære		
Rabarber		
Ribs		
Solbær		
Stikkelsbær		
Sharon/kakifrugt		
Vandmelon		
Vindrue		
Æble		

The iPOPY project www.coreorganic.org

The aim of the project "innovative Public Organic food Procurement for Youth – iPOPY" (http://www.ipopy.coreportal.org/) is to study how increased consumption of organic food may be achieved by the implementation of strategies and instruments used for public procurement of organic food in serving outlets for young people. Supply chain management, procedures for certification of serving outlets, stakeholders' perceptions and participation as well as the potential of organic food in relation to health and obesity risks will be analysed. The research project is a cooperative effort between Norway, Denmark, Finland and Italy (2007-2010). German researchers are also participating, funded by the Research Council of Norway. The iPOPY-project (2007-2010) is one out of eight transnational pilot projects funded by the CORE Organic funding body network within the context of the European Research Area.

Project contributors:
Norway: Bioforsk Organic Food and Farming and SIFO, National Institute for Consumer Research
Germany: University of Applied Sciences, Münster and Center for Technology and Society, Berlin Institute of Technology
Denmark: DTU, Technical University and DTU, National Food Institute
Finland: University of Helsinki, Ruralia Institute
Italy: State University of Milano, Dep. of crop science and ProBER (Association of organic and biodynamic producers of the administrative region of Emilia Romagna)

Project manager: Anne-Kristin Løes, Bioforsk Organic Food and Farming Division, Norway

iPOPY reports:

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***Mikkola**, M.; Bioforsk Report Vol. 3 No. 41 2008, iPOPY discussion paper 2/2008, Organic and conventional public food procurement for youth in Finland.*

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***Nölting**, B. (ed.) (2009)); CORE Organic Project Series Report, International Centre for Research in Organic Food Systems (ICROFS), Tjele, DK. Providing organic school food for youths in Europe - Policy strategies, certification and supply chain management in Denmark, Finland, Italy and Norway. Proceedings of the iPOPY seminar held at the BioFach February 20th 2009 in Nuremberg, Germany.*

All publications can be downloaded from the website:
http://www.orgprints.org/ (enter "iPOPY" as keyword)