Barns matmot 2.0

Diet, development, and food neophobia in early years.
How to promote healthy diets in a kindergarten setting

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Summary

Introduction

Early diet has a profound impact on a child's development, growth, and future health. A varied diet with a high intake of vegetables is positive in several domains of health. In Norway, as in many other countries, the intake of vegetables is too low among both children and adults. An important barrier to vegetable intake in children is food neophobia. Food neophobia, meaning unwillingness to try unfamiliar foods, is a trait that is most explicit in children between two and six years of age. As this age period is important for the development of food preferences and lifelong dietary habits, understanding which factors are related to food neophobia in early age is important to know how to best improve long-term diet and lay the foundations for lifelong health. Most children eat several meals per day in kindergarten. The kindergarten setting is thus an arena with great opportunity to influence the food intake and food preferences of young children. Web-based intervention programs to promote healthy eating can be appealing, cost-effective and capable of reaching large groups of children and caregivers. Providing online resources and interactive tools also represents a promising way of providing support to kindergartens, however data on such interventions targeting diet and meals in kindergartens are scarce.

Aims and objectives

The overall objective of this thesis was to explore aspects of early diet in relation to food neophobia and neurodevelopment, and to promote healthy food habits through developing, implementing and evaluating the web-based kindergarten intervention *Barns matmot 2.0,* in a cluster randomised controlled trial setting.

Materials and methods

In the present study, both a cross-sectional design exploring quantitative baseline data, and the design of a cluster randomised controlled trial is used. The participants were one-year-old children from kindergartens in Norway. The

participating kindergartens were randomised into two intervention groups and one control group. Children in intervention group 1 were served warm lunch meals including three alternating intervention vegetables three days a week during the intervention period of three months. Children in intervention group 2 were served the same meals and in addition kindergarten staff performed pedagogical sensory lessons adapted from the Sapere method. All recipes and information to the kindergarten staff and parents were on two password-protected study websites. All data were derived from parent-reported, web-based questionnaires at baseline and post-intervention. The questionnaires included questions about food habits, food neophobia and neurodevelopment. In the cross-sectional part of the study linear regressions were performed on the baseline data to investigate potential associations between food neophobia and breastfeeding duration, operationalised both as exclusive breastfeeding and any breastfeeding (paper 2) and to investigate whether breastfeeding and typical components of a healthy diet in infancy were associated with higher neurodevelopmental scores at the age of one year (paper 3). The effect of the intervention on level of food neophobia and vegetable intake were evaluated by using regression analyses (paper 4).

Summary of main findings

The first paper is a study protocol, describing the rationale for the study and its outcomes, the development of the intervention and the recruitment of participants. A total of 267 children from 46 kindergartens were registered for the study, whereof 246 parents answered the questionnaire at baseline. The second paper is a cross-sectional study, evaluating the association between breastfeeding duration and food neophobia. We found that compared to shorter breastfeeding duration, still being breastfed at 12 months, and being exclusively breastfed at 5 months were associated with slightly higher scores of food neophobia at 16 months of age. The third paper is also a cross-sectional study, investigating the association between dietary factors, including breastfeeding, and neurodevelopment. In the sample of 212 one-year-old children, a longer duration

of breastfeeding was associated with higher neurodevelopmental scores. Dietary intake of fish, fruits and vegetables was also associated with higher neurodevelopmental scores. The fourth paper reports the effect of the intervention study in kindergartens. The results in the sample of 144 children suggested a higher intake of the three intervention vegetables in group 2 (diet + sapere). There was also a weak suggestion that the total vegetable intake increased in group 1, but the results were inconclusive. We were not able to detect any effect on the level of food neophobia in either intervention group.

Conclusion

We found an association between longer breastfeeding duration and higher scores of food neophobia. These results may inform the debate on optimal timing of complementary feeding, but more research is needed to confirm these findings. We also found that longer breastfeeding duration and more frequent intakes of fish, fruits and vegetables was associated with higher neurodevelopmental scoring in one-year-old children. This reinforces the notion that a child's food intake and food variety has a great potential already from early infancy. The kindergarten dietary intervention *Barns matmot 2.0* increased the intake of intervention-targeted vegetables. As the kindergarten setting is an arena with great opportunities to influence young children's diet and food preferences, web-based programs can help kindergarten staff improve their skills and knowledge in cooking and how to learn children about food and taste and thereby promoting preconditions for an optimal child development and health.

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List of papers

Paper 1

Blomkvist EAM, Helland SH, Hillesund ER, Øverby NC.

A cluster randomised web-based intervention trial to reduce food neophobia and promote healthy diets among one-year-old children in kindergarten: study protocol

BMC Pediatrics. 2018;18(1):232. doi: 10.1186/s12887-018-1206-8

Paper 2

Øverby NC, Blomkvist EAM, Hillesund ER

Associations between breastfeeding mode and duration and food neophobia in toddlerhood: A cross-sectional study among Norwegian toddlers

Food & nutrition research. 2020;64. doi: 10.29219/fnr.v64.3615

Paper 3

Blomkvist EAM, Hillesund ER, Helland SH, Simhan I, Øverby NC.

Diet and Neurodevelopmental Score in a sample of one-year-old children – A cross-sectional study

Nutrients. 2019;11(7). doi: 10.3390/nu11071676

Paper 4

Blomkvist EAM, Wills AK, Helland SHH, Hillesund ERH, Øverby NC.

Effectiveness of a kindergarten-based intervention to increase vegetable intake and reduce food neophobia among one-year-old children: a cluster-randomised trial.

Submitted to Food and Nutrition Research

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1 Introduction

The name of this study, *Barns matmot* means directly translated to English *Children's food courage.* The term food courage describes partly what this study is about, namely, to give children courage to taste and to eat a variety of foods. The term food courage can be viewed as the opposite of the term food neophobia, which will be explained further in this introduction chapter.

1.1 Diet in early years

The Developmental Origins of Health and Disease (DOHaD) hypothesis proposes that exposures during early life may have a lifelong impact on the individual's health and diseases (1). Similarly, The World Health Organisation (WHO) states that right nutrition during the 1000 days between conception and the child's second birthday (the 1000-day window) has a profound impact on a child's ability to grow, learn and thrive (2).

The health benefits of breastfeeding are well documented. The benefits for the child include protection against child infections, improved cognitive function and probable reductions in overweight and diabetes (3). There are also benefits for the mother including protection against breast cancer and a probable protection against ovarian cancer and type 2 diabetes (3). The World Health Organisation (WHO) recommends exclusive breastfeeding for the child's first six months to achieve optimal growth, development, and health (4, 5). The European Society for Paediatric Gastroenterology, Hepatology and Nutrition (ESPGHAN) Committee on Nutrition adds to their recommendations that complementary feeding (i.e., solid foods and liquids other than breast milk or infant formula) should not be introduced before 17 weeks (4 months) and not later than 26 weeks (6 months) (6). The Norwegian Directorate of Health recommends that infants should be exclusively breastfed for the first four to six months, depending on the mother's and infant's needs, followed by a gradual introduction of food in parallel with continued breastfeeding (7). In practice, solid food is often

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introduced before child age six months in Norway, as well as in most European countries (8-10).

In Norway, as in many other countries, national guidelines recommend the consumption of five or more servings per day of fruits and vegetables, of which preferably half should be of vegetables (11, 12). For adults, one serving corresponds to approximately 100 grams. There are no specific recommendations for daily amounts of vegetables for children, but it is often said that one portion for children corresponds to a handful, so the portion size increases with increasing age. A national survey from 2006-2007 revealed that the average intake of fresh fruits, berries and vegetables in one-year-old children in Norway was only 107 grams per day, of which only 32 grams of fresh or frozen vegetables (13). A recent update of this survey (2018-2019) showed that average intake of fresh fruits, berries and vegetables in one-year-old children in Norway had increased to 172 grams per day, of which 57 grams of fresh or frozen vegetables (10). Even though the vegetable intake in young children has increased somewhat this last decade, the aim for health authorities is to continue to increase the intake of fresh and frozen vegetables in Norway (14).

High consumption of fruits and vegetables as part of a healthy diet is advocated for the prevention of chronic diseases, such as coronary heart disease, stroke and some cancers (15). Results from a large prospective cohort study including 18 different countries world-wide showed that three to four servings (375-500 grams) of fruit, vegetables and legumes per day seems optimal to reduce risk for both non-cardiovascular mortality and total mortality (16). Throughout life, a suboptimal diet is a preventable risk factor for non-communicable diseases, and a low intake of fruit and vegetables is an issue of major concern (16-21). Even though a wealth of evidence points to the health benefits of diets rich in fruits and vegetables, the intake of these food groups is far below recommended intake in many countries (22).

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1.2 Neurodevelopment

Child development refers to the continuous but predictably sequential biological, psychological, and emotional changes that occur in human beings between birth and the end of adolescence (23). The sequence of development is the same for all children and can be described in terms of developmental milestones or skills, but children develop at different rates so that the age of attainment for each skill can range widely (23). Child development is a dynamic and complex process, which includes many aspects or domains of development. The domains of development can be categorized into four major areas (24):

1: Motor development, both gross motor skills (the control of large groups of muscles involved in walking and sitting) and fine motor skills (the manipulation of objects with the hands).

2: Language performance, consisting of articulation, receptive and expressive language skills, and the use of nonverbal symbols.

3: Adaptive or cognitive development, including problem solving, perception and verbal and nonverbal reasoning.

4: Personal or social development encompasses the child's interactions, as shown by the formation and maintenance of relationships and responsiveness to the presence of others. Personal development involves the formation of self-help skills such as feeding, dressing and toileting.

1.2.1 Assessment of neurodevelopment

Developmental screening is a way to assess skills in a variety of domains. Some examples of developmental screeners that can be utilised by trained professionals are the Denver II screening test (25), the Bayley Infant Developmental screener (26) and the Battelle Developmental Inventory (27). These tests offer comprehensive information on a child's current developmental status, but a major disadvantage of these tests is that they require thorough training of personnel, and that they take relatively much time and effort to administer and interpret.

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Parent-completed screening tools have several advantages. These tests have generally good psychometric properties and are well standardized, they are inexpensive and can be completed by parents in the home setting (24). Examples of parent-completed screening tools are the Child Development Inventories (28), the Parents' Evaluation of Developmental Status (29) and the Ages and Stages Questionnaire (30). The Ages and Stages Questionnaire is among the most widely used parent-completed questionnaires for young children (31). The Ages and Stages Questionnaire is explained in detail in the Methods chapter.

1.2.2 Breastfeeding, diet, and neurodevelopment

Adequate nutrition and diet quality is necessary for normal brain development and therefore of utmost importance in the early years where brain development is at its peak (32, 33). The very rapid growth of the brain in the womb and the first two years of life places great demands on the diet to provide the basis for a healthy growth and makes it vulnerable for dietary deficiencies (34) .

Breastfeeding and formula feeding may have different effects on neurodevelopment for several reasons. Breastmilk contains compounds that may specifically promote nervous system development, such as long-chain polyunsaturated fatty acids (LCPUFAs), hormones and growth factors, which is absent, or present in lower concentrations, in infant formula (35, 36). In addition, the process of breastfeeding and formula feeding differ in ways that may affect neurodevelopment. The contact between mother and child during breastfeeding may facilitate the bonding process and enhance development (35). Breastfeeding have been associated with better neurologic outcomes from infancy to adulthood, but the evidence is conflicting, and the findings of the research in this field could be confounded by many factors, such as maternal education and socioeconomic status, and related positive health behaviours that can independently favour neurodevelopment (37, 38).

A range of nutrients in foods, such as iodine, iron, zinc, choline, vitamin B12, folate and vitamin D, play important roles in brain development (39, 40). Whole foods contain many nutrients, many of which act synergistically. There is also the possibility that there are essential elements in natural foods that have not yet been discovered. Healthy dietary patterns in childhood can support cognitive and neuropsychological development, and studies have shown that a good quality diet in the early years of life may have a positive effect on academic performance in children and adolescents (41-44).

1.3 Development of food preferences

The development of food preferences begins in the womb and continues across the life course. Both amniotic fluid and breast milk contain molecules derived from the mother's diet, giving the child opportunities to learn about flavours already in the womb and in early infancy (45). Shortly after birth, young infants show characteristic responses to the basic tastes sweet, umami (savoury), bitter and sour. The inborn preferences of sweet and umami elicit a positive facial response in the newborn, while sour and bitter taste elicit a negative response (46). These taste preferences may reflect a biological drive towards foods that are calorie- and protein-dense and an aversion to foods that are poisonous or toxic. The preference of salt emerges by approximately 4 months of age (47). Preferences for sweet and salty taste are highest during early childhood and decline somewhat with age. However, children's initial predispositions to taste and food preferences can be modified by experience with food and eating (47, 48). During early infancy, human babies are nourished exclusively by milk, and during this period, food intake is governed by instincts rather than food preferences. Once solid foods are being introduced, food preferences begin to influence food intake. Food preferences and food choices established in early childhood tend to track into adolescence and adulthood, implicating early experience as a foundation for the development of food preferences (49-52).

Thus, early modification of food preferences may be an important step towards healthy lifelong dietary habits.

Identifying factors that influence food preferences is critical to the development of effective interventions to improve children's diets. Perhaps the most important determinant of a child's liking for a particular food is the extent to which it is familiar (53). One may say that children like what they know and eat what they like. Repeated exposure to increase familiarity of a food can therefore potentially increase liking of the food. Other factors that can influence a child's food preferences are food neophobia and social and environmental influences such as modelling and parents' feeding practices (45, 47). Some of these factors are described further in this thesis.

1.4 Food neophobia as a barrier to a good quality diet in early years

1.4.1 Food neophobia

Neophobia literally means "fear of the new", and food neophobia is defined as a reluctance or unwillingness to eat unfamiliar foods (47). Food neophobia is considered a normal developmental stage that typically starts when the child is around two years old, is most explicit in children between 2 and 6 years, and is gradually decreasing with age into a relatively stable level in adulthood (54). Figure 1 illustrates a proposed lifespan model of food neophobia.
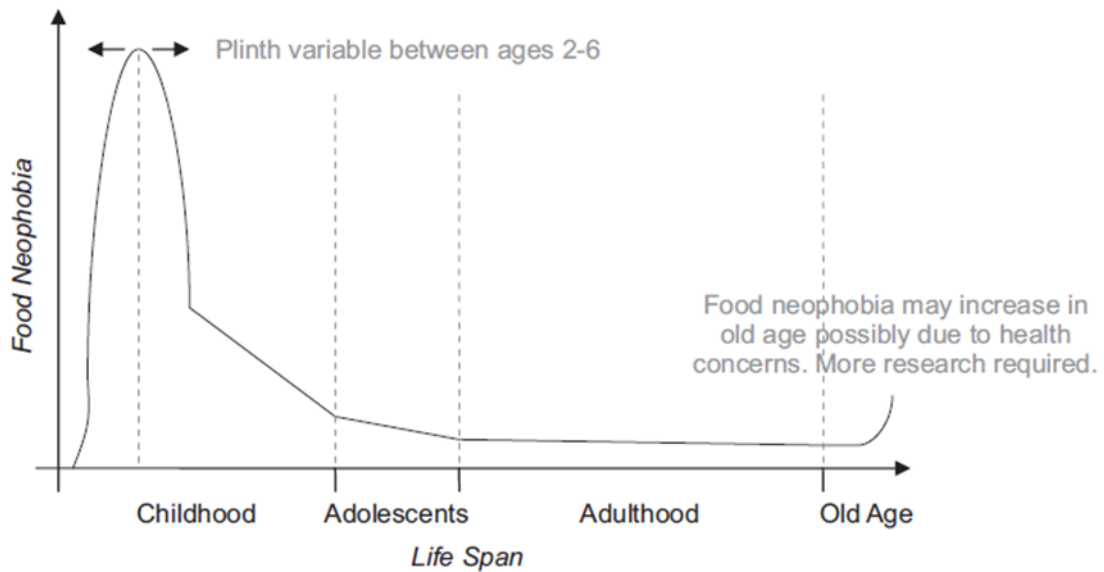
Figure 1: A potential lifespan model for levels of food neophobia in humans. Reprinted from ©Dovey et al. (54), with permission from Elsevier.

In ancient times, eating new foods could be potentially dangerous, so the neophobic rejection of novel foods can be viewed as an adaptive response, protecting the individual from poisonous substances. Nowadays, in our relatively safe but diverse food environment, food neophobia serves to limit children's dietary repertoire (54).

The level of food neophobia is a heritable trait. Faith et al. found in their twin-study of 4-7-year-old children a heritability estimate of 72 per cent (55), while Knaapila et al. suggested that at least 59 per cent of the variation in food neophobia in adults is due to genetic effects (56). Cooke et al. estimated genetic and environmental influences on food neophobia in 8-11-year-old twins and indicated that 78 per cent of the variation in food neophobia was because of additive genetic factors, with the remaining variance attributable to nonshared (i.e., unique or random) environmental factors (57). Notwithstanding high heritability, parents shape the home food environment and parental food choices influence children's responses to new foods; parents who consume a variety of food have children with an increased willingness to try new foods (58).

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Some studies have found a tendency for higher food neophobia in men and boys, as compared to women and girls (59, 60). However, Pliner and Hobden found no gender differences with respect to food neophobia (61). Dovey et al. also argues that there are no significant gender differences in food neophobia (54). Differences in food neophobia across food cultures may be ascribed to differences in feeding practices, food availability and food consumption. Proserpio et al. compared food neophobic traits among children aged between 9 and 12 years from five different countries and found that British and Swedish children showed higher degree of food neophobia compared to Finnish children, but that the differences were small (62).

Food neophobia or neophobic behaviour is often considered to be one specific component of picky or fussy eating (54, 63, 64). Food neophobia and food fussiness are found to be strongly correlated in early childhood, and are claimed to share a common aetiology, indicated by high genetic and shared environmental correlations (65). Neophobic children do not necessarily only reject novel foods, but are also more likely to reject less palatable but familiar foods, which is also characteristic of "pickiness" (66). Picky or fussy eating is characterised by an unwillingness to eat both familiar foods and to try new foods, as well as strong food preferences (67, 68). Picky eating may, as with food neophobia, lead to a diet with limited variety and a low intake of fruits and vegetables (63, 69, 70). The terms picky and fussy eating are often used interchangeably with terms like food fussiness, choosy eating, and selective eating. There has been little consensus on the definition of picky eating, and on the choice of assessment tools (54, 67, 70, 71), though Brown and Perrin recently developed a new questionnaire including seven commonly used measures of picky eating (72). A possible theoretical interaction of picky/fussy eating, food neophobia and exposure to foods is shown in figure 2.

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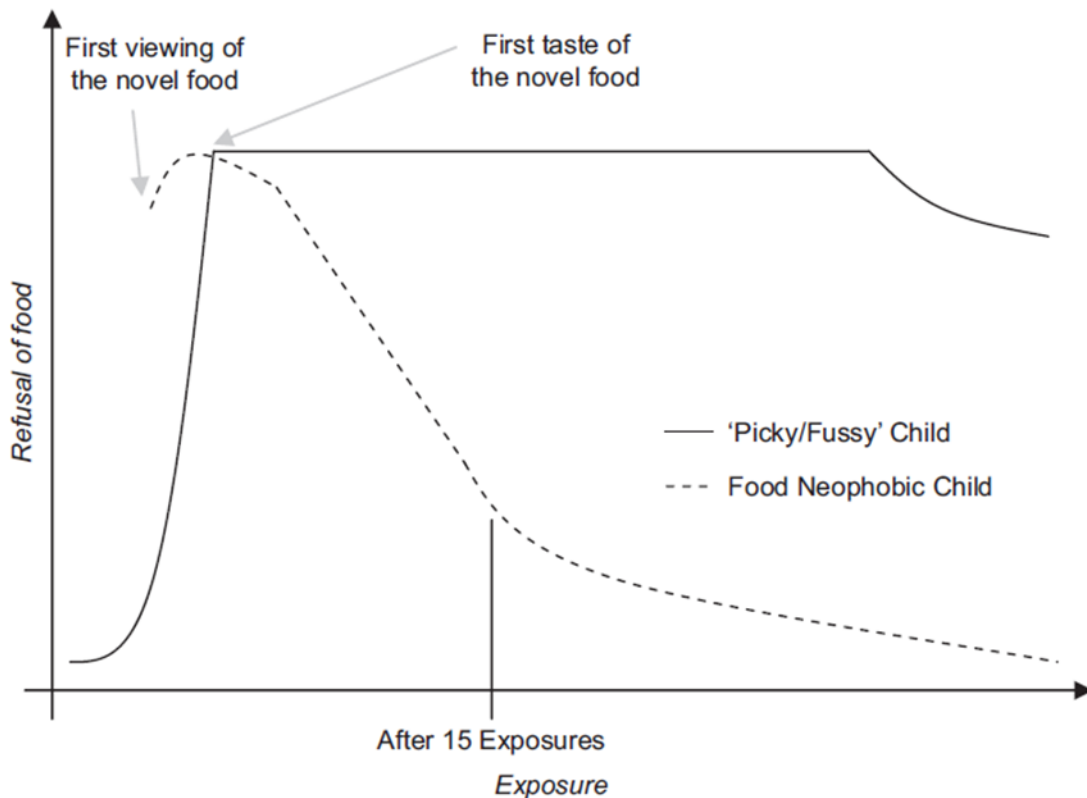
Figure 2: Likelihood for acceptance of fruits and vegetables in food neophobic and picky/fussy eating children. Reprinted from ©Dovey et al. (54), with permission from Elsevier.

Most children exhibit some degree of caution in response to unfamiliar foods, but according to Wardle and Cooke, roughly 20-30% are significantly neophobic (73). Brown et al. found in a systematic review that the prevalence of food neophobia in children in various studies ranged from 40 to 60 per cent, while the variation in prevalence of picky eating was large; between 6 and 60 per cent (71). Mascola et al. found that at any given age from 3 to 11 years, between 13% and 22% of the children were reported to be picky eaters (74). Overall, 39% of the children, with no differences between genders, were identified as picky eaters at some point during this longitudinal study. They also found that the incidence of picky eating was highest in early childhood declining to low levels by six years of age. This corresponds with the incidence of food neophobia, which tend to peak between the ages 2 to 6 years (74). The prevalence of food neophobia decreases throughout childhood, adolescence and adulthood (figure 1) (54, 75).

Since there are no standardised cut-off values for classifying individuals as food neophobic, the reported estimates of the prevalence of food neophobia must be considered with caution.

1.4.2 Breastfeeding and food neophobia

Early sensory experiences through breastmilk can increase familiarity with a variety of flavours (76). These early experiences are positively associated with infants' and young children's general food acceptance and specifically with vegetable acceptance and intakes (77-80). Whether being breastfed per se reduces or increases food neophobia has been discussed. Human milk provides more flavour variation, according to the mother's diet, than infant formula, and this exposure to different flavours potentially increase the willingness to try new foods (81-84). To the contrary, formula fed children may be introduced to complementary food earlier, and to a greater extent and variety than breastfed children due to breastmilk being a larger component of diet in those breastfed. This earlier exposure to solid foods could potentially reduce food neophobia in those formula fed. However, few studies have investigated the associations between breastfeeding mode and duration and level of food neophobia, and the results are inconclusive (70, 81, 85).

1.4.3 Food neophobia and its associations with dietary intake and quality

Food neophobia is an important determinant of food choices (86), and children's level of food neophobia is a strong predictor of the number of foods never tasted and the number of foods disliked (87). Food neophobia is negatively associated with food variety and may lead to an inadequate nutrient intake (88-91). Studies have found that children with a higher level of food neophobia have a lower intake of fruits, vegetables and animal foods such as fish and meat (92-94). These findings are consistent with the suggestion that neophobia has a protective function since these foods are the most potentially dangerous; toxins are found in many plants and animal foods may contain food poisoning bacteria (54).

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It has been suggested that food neophobia may be related to both underweight and overweight in children, but the results are inconclusive, and many studies show no relationship between food neophobia and weight status (71, 88).

1.4.4 Assessment of food neophobia

In humans, food neophobia is often measured by the Food Neophobia Scale (FNS), a validated ten-item questionnaire developed by Pliner and Hobden (61). High scores of the FNS indicate a low anticipated liking of unfamiliar foods and low familiarity of foreign cuisines, as well as low willingness to try unfamiliar foods. Pliner and Hobden also developed The Child Food Neophobia Scale (CFNS), a validated 10-item scale that uses parental report to assess children's willingness to sample new foods (95). Reports by parents are often the only means of obtaining data on infants and young children. The CFNS questionnaire is described more in details in the methods chapter.

In 2017, Damsbo-Svendsen et al. reviewed instruments developed to measure food neophobia (96). They found that among 13 different instruments to assess food neophobia and willingness to try new foods, the FNS by Pliner and Hobden was one of the most used instruments. However, the FNS was developed more than 25 years ago, and some of the items, such as "ethnic" food and "food from different cultures" may not reflect food neophobia currently. Damsbo-Svendsen et al. found that the Children's Eating Behaviour Questionnaire (CEBQ) by Wardle et al. (97), appeared to be the best instrument to investigate early signs of food neophobia, since it was developed for 2-9 years old children. The CEBQ is a 35-item parent-rated questionnaire assessing eight dimensions or scales of eating style in children, where four items about willingness to try new foods are included in the fussiness scale ("My child enjoys tasting new foods", My child is interested int tasting food s/he hasn't tasted before", "My child refuses new foods at first" and "My child decides that s/he doesn't like food, even without tasting it"). According to the review of Damsbo-Svendsen et al., the CFNS by Pliner and Hobden appeared to be a reliable instrument to assess food neophobia from the

age of 5 (96). Subsequently, Damsbo-Svendsen et al. developed a new tool, the Food Neophobia Test Tool (FNTT), to measure food neophobia in children aged 9-13 years (98). To the best of my knowledge, there has not recently been developed new tools to measure food neophobia for the youngest children.

1.5 *Modifying children's food preferences and food intake*

Although humans are predisposed to prefer certain tastes and regard novel foods with suspicion, several factors can influence and modify children's food preferences and habitual intake. Because infants and toddlers are dependent on parents and other caregivers for sustenance, parental feeding practices, including what, when and how parents and caregivers feed their children, play a critical role in the formation of young children's food preferences and eating behaviours (99). Children's acceptance of a new food can for instance be influenced by examples provided by parents or other caregivers and siblings (modelling), number of exposures to a new food, verbal praise given in a social context, family characteristics and long-term effects of early feeding (100).
Among several potential ways to influence children's food preferences and food intake, three strategies, which are assumed relevant for young children and the kindergarten setting, were chosen for the project *Barns matmot 2.0*. These strategies are explained further below.

1.5.1 Repeated exposure

Robert Zajonc described the effect of repeated exposure in the 1960's. He posited that the development of any preference (be it music, food or ideological values) occurs when an individual is exposed repeatedly to a particular stimulus (101). This was also shown to be true concerning foods, as an increase in familiarity with a food reduces neophobic reactions (102). The repetition of a food to a child is one of the primary determinants of its acceptance (103). The impact of food neophobia on the willingness to try unfamiliar foods is limited to the point where

the child places the food in his/her mouth, but may continue to have a negative effect on willingness to try foods for up to 15 exposures (see figure 2 from Dovey at al.) (54). Early exposures and experiences are important for the acceptance of some foods, particularly vegetables, which often have a bitter component in their flavour profiles. Persistent offering of a vegetable result in improvements in children's preference of the vegetable and repeated exposure is highly important for increasing children's vegetable consumption (104-106). There is some evidence that the effect of repeated exposure on acceptability is likely to generalise to other foods within the same food category (107-110).

Although repeated exposure to new foods has been shown to be an effective way to reduce neophobia, there is some conflicting evidence regarding how much experience is necessary to reduce the neophobic response. In a sample of 4 to7 month-old-infants, Birch et al. noted a significant increase in the intake of a target food already after one exposure, suggesting that, for infants, relatively minimal experience with the target food, or even with similar foods, could produce significant increases in the intake of the target food (111). The neophobic response is less well developed in the infant than in the young child so the older children may need more exposures to increase acceptability of an exposed food. Studies have found that 3-5 exposures may be sufficient to increase intake of an exposed food in children up to 4 years of age (109, 112, 113). A study with 3-6 years old children found that vegetable liking increased by the sixth exposure (114), while a systematic review by Nekitsing et al. (2018) suggested that 2-5 years old children required approximately 8-10 exposures to improve their vegetable intake (115).

Despite the efficacy of the mechanism of repeated exposure, foods are most often only presented a limited number of times (116). Carruth et al. found that about 25 per cent of the caregivers offered new foods only one to two times before they decided their child disliked the food (100). Only a few of the caregivers offered foods six to 10 times in the first year. Children whose parents persist through the

child's initial rejections and continue to present foods until they are accepted may be less picky or neophobic later in life (100).

1.5.2 Modelling

Observational learning is often referred to as "modelling", that is that people learn about what to expect through the experience of others (117). Modelling by parents or peers is a well-known strategy that can influence food intake in children (118, 119). That is, children who are given the opportunity to watch models eating a certain food are more likely to try eating the food themselves. Social Learning Theory by Bandura suggests that modelling by teachers or by peers, would be one of the most effective methods to encourage food acceptance in preschool children (120). Hendy and Raudenbush (2000) found that enthusiastic teacher modelling was effective to encourage children's new food acceptance during preschool lunches, but that its effectiveness disappears if competing peer models are present, suggesting that peer modelling is an even more efficient method to encourage food acceptance in children than teacher modelling (121). Kutbi et al. (2019) found that peer modelling of beneficial eating was negatively correlated with food neophobia (122). When a child observes another child consuming the same food, the child will most likely try it and accept it. Because of the positive role that teachers and peers can play in encouraging children to try new foods, settings such as preschools or kindergartens are suited to efforts to overcome food neophobia.

1.5.3 The Sapere sensory education

Sensory education or training, allowing children to explore foods using all five senses, is another approach to increase children's willingness to taste new foods (123-126). The Sapere sensory educational programme with taste lessons (classes du goût) was developed for schoolchildren in France in the 1970's by Jacques Puisais to reverse the trend towards poor diets and a loss of diversity in food culture (127). The aim of the program was to awaken children's interest and

curiosity in foods and to teach them to become well-informed consumers with awareness of the quality and differentiation of foods regarding smell, textures, and tastes. The name Sapere comes from Latin and it means to know, to feel, to taste and to become brave. This education programme provides a combination of explicit learning about sensory perception and implicit learning through actual sensory experience with food. The Sapere international association, a non-profit organisation, was founded in 1995 and the method has spread to numerous other countries including Norway (128). The method has been adapted to younger children and is being used in kindergartens and preschools in several countries (129-131). In Sweden, a teaching manual for kindergarten teachers was published in 2010 by Algotson and Öström called *Sinnenas Skafferi (Food and the senses)* (132). This manual has also been translated to Norwegian (133).

DeCosta et al. (2017) wrote a systematic review about experimental research to change children's eating behaviour (134). They found that sensory education in schools could lead to a decrease in food neophobia, at least in the short term, but that there is a need for more research on the subject. The studies included in this review was performed on children in the age group between 7 and 12 years old. Data from interventions with sensory education to reduce food neophobia in preschool children are scarce. Hoppu et al. (2015) found that a sensory-based food-education in a kindergarten setting among children aged 3-6 years could increase children's willingness to eat vegetables and berries, but the effect on food neophobia was not measured (123). Kähkönen et al. (2018) found that a sensory-based food education in children aged 3-5 years was positively associated with the children's willingness to choose vegetables, berries and fruit, but only with the children of mothers with a low level of education (131). The effect of food neophobia on willingness to choose and eat was examined, but the researchers did not directly measure whether the sensory-based food education had a positive effect on the level of food neophobia. A qualitative study from the precursor of the project *Barns matmot 2.0*, *Barns matmot – Preschoolers Food Courage*, found that all kindergarten staff perceived the sensory education

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sessions as successful and reported that both toddlers and staff expanded their vocabulary and increased their attention to sensory impressions of food (135). Findings from studies in both school children and in preschool children suggests that sensory awareness might be a promising component in food neophobia interventions, but the effect remains unclear and more research on this subject is needed, especially in the younger children.

1.6 Kindergarten as a setting to promote healthy diets

In line with the previously mentioned developmental origins theory (DOHaD), interventions in early childhood are likely to have a strong impact on health outcomes later during childhood and adulthood. Kindergartens are potentially important settings for influencing children's food choice and habit formation at an early age and there has been a call for intervention studies in this field (136). A relatively recent umbrella-review supports the proposition that interventions to promote healthy eating in children attending centre-based childcare can be effective (137). In Norway, the term *kindergarten* describes an educational service for children aged 0-5 years. More than 90 per cent of all children between 1 and 5 years of age attend kindergartens in Norway, with the majority attending for 41 hours or more per week (138). The fact that most children spend a lot of time in kindergartens in Norway makes it possible to reach many children and their families through a kindergarten setting.

1.6.1 Food and meals in Norwegian kindergartens

There are normative national guidelines for food and meals served in Norwegian kindergartens (139). These guidelines recommend kindergartens to serve or provide food for at least three meals per day. Meals are either brought from home (lunch box), provided by the kindergarten or a combination of the two. It is estimated that each child eats more than 3000 meals during his or hers five years in kindergarten (140). There are specific recommendations on what types of food

should be served, but less specific on feeding styles and feeding practices, however, it is emphasised that child-care staff should take an active role during meals because they are important role models for the children. There is also a paragraph with advice on letting the children participate in activities regarding food and meals, such as food preparation, setting the table and learning about different types of food and food traditions (139). In addition to the guidelines for food and meals, kindergartens have a framework plan for their content and tasks, which underlines that the kindergarten has a responsibility to contribute to teaching children healthy dietary habits (141). The kindergarten law and associated guidelines apply to all kindergartens, both public and private (142).

Meals in kindergartens may be an important setting where children can be exposed to a wide variety of foods with kindergarten staff and peers as role models. Despite the existence of best-practice guideline recommendations for childcare services to implement evidence-based policies, practices and programmes to promote child healthy eating, many childcare services fail to do so (143). In a national survey among kindergarten staff, 10 per cent of the managers and 30 per cent of the pedagogical leaders answered that they did not know about the guidelines for food and meals in kindergartens (144). The implementation of the guidelines differs a lot between kindergartens. Few kindergartens have their own kitchen staff or cook, and the food served can vary widely (144). As the main meal, most kindergartens provide a cold meal with bread. Serving vegetables seems to be especially challenging; only one out of three kindergartens serves vegetables daily, while more than one in four kindergartens serves vegetables less often than once a week (144).

1.6.2 Theories informing interventions in childcare services

A theory presents a systematic way of understanding events, behaviours and/or situations (117). Theories and models help explain behaviour, as well as suggest how to develop more effective ways to influence and change behaviour (145).

The already mentioned umbrella-review, investigating the effectiveness of interventions to promote healthy eating in children aged 2-5 years attending centre-based child-care, found that the most common theoretical frameworks used were behavioural change theories including social cognitive theory and the social ecological model (137). However, reviews which identified theoretical underpinnings found that most of the studies were developed without making theoretical models or frameworks explicit. A common recommendation in the reviews was that studies should underpin intervention design with theoretical frameworks and effective behavioural change theories, ideally components of social cognitive theory alongside a social-ecological framework (137).

Social learning theory by Bandura (120), also known as social cognitive theory, addresses the interaction between person, environment and behaviour. A basic premise of the social cognitive theory is that people learn not only through their own experiences, but also by observing the actions of others and the results of those actions (145). In Social cognitive theory, a person can be both an agent for change and a responder to change. Thus, changes in the environment, the examples of role models and reinforcements can be used to promote healthier behaviour (145).

One conceptual framework which serves to direct attention to both behaviour and its individual and environmental determinants is an ecological perspective, such as that proposed by Bronfenbrenner (146). Social ecological models emphasise multiple levels of influence, such as individual, interpersonal, institutional or organisational, community and public policy, and the idea that behaviours both shape and are shaped by the social environment (145). The principles of Social ecological models are consistent with Social cognitive theory concepts, which suggest that creating an environment conducive to change is important to facilitate adoption of healthy behaviours (145). The understanding of how people interact with their environments can be used to develop effective multi-level approaches to improve health behaviours (147).

1.7 Digital/web-based intervention programs

The internet has come to play an important role in our everyday lives. In Norway, 98 % of the population had access to the internet per 2018 (148). Parents access nutrition information online (149), and caregivers tend to use the internet for both information, support and education (150). Helle et al. found in their E-health intervention, that 80 per cent of mothers preferred to source information on infant nutrition from the Internet (151). Web-based intervention programs to promote healthy eating can be both appealing, cost-effective and capable of reaching large groups of children and caregivers (152).

There are various definitions of web-based interventions. Hamel et al. defined web-based interventions as programs delivered through a computer or Internet platform to promote health-related changes in behaviour (152). Yoong et al., who conducted a web-based intervention to improve dietary guideline implementation in childcare centres, did not define their use of the term web-based, but administered a web-based tool to support menu planning and provide education materials to childcare centres (153, 154). Koneska et al. published a recent systematic review on usage metrics of web-based interventions evaluated in randomised controlled trials (155). The authors defined web-based or a web intervention as "downloadable or accessible via the internet through a web browser," which can take the form of (but not limited to) a website, an email, or a web message board.

A study of 214 Australian childcare services found that almost all services have the existing infrastructure (including computer and internet) to use web-based programs (153). Most of the childcare services reported that a web-based tool to support menu planning and provide educational materials would be useful to support them with implementing dietary guidelines. Providing online resources and interactive tools, thus represents a promising way of providing support to kindergartens and other types of childcare services, however data on such interventions targeting diet and meals in kindergartens are so far scarce. Yoong

and colleges did a 12-month RCT in childcare centres in Australia to assess the effectiveness of a web-based menu planning intervention in increasing the mean number of food groups on childcare service menus that complied with dietary guidelines regarding food provision to children in care (156). Recently published findings from this study indicated that a web-based menu planning intervention may improve the regularity of serving for some healthy food groups and reduce the provision of discretionary foods, although the improvements in childcare service overall menu and individual food group compliance with dietary guidelines were not statistically significant (157). However, this web-based intervention yielded some improvements on child-level by improving child consumption of healthier foods in day care (154). To the best of my knowledge, other similar web-based interventions in kindergartens or childcare services have not been published.

1.8 Knowledge gaps

As described in this introduction chapter, there is a substantial amount of research regarding children's food preferences, early dietary habits, and food neophobia. However, there are still knowledge gaps to be filled.

Early sensory experiences through breastmilk can increase familiarity with a variety of flavours, but as described in the section 1.4.2 there are knowledge gaps regarding whether breastfeeding mode and duration is associated with children's food neophobia.

Despite existing knowledge about how important adequate nutrition and diet quality is for normal brain development, to the best of my knowledge, the associations between dietary factors and neurodevelopment have not been explored in children as young as one year old in a highly developed country as Norway. The collection of comprehensive baseline data in the present study gives us the opportunity to explore these associations.

According to Olsen (2019), there is a need to address how to best introduce children to a wide palette of taste experiences in order to counteract pickiness and neophobia (158). Perry et al. (88) and Bell et al. (159) highlights the need for interventions to begin early to expose children to a wide variety of nutritious foods before the age of two when neophobia begins to peak. To the best of my knowledge, *Barns matmot 2.0* is the first intervention directed to reduce food neophobia in one-year-old children. There are also few studies using elements of the Sapere sensory education in children this young.

A Cochrane review of interventions aiming to increase consumption of fruit or vegetables or both among children aged five years and younger was recently updated (160). Despite identifying 80 eligible trials of various intervention approaches, the evidence for how to increase children's fruit and vegetable consumption remains limited. Of the types of interventions identified, there was

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moderate-quality evidence that multicomponent interventions probably lead to small increases in fruit and vegetable consumption in this age group, but the multi-component interventions amounted only 14 of the 80 trials.

When this present study was planned (2016), no studies targeting kindergartens used online resources in the implementation of interventions, even though web-based interventions have the potential be both appealing, accessible, cost-effective, and easily scalable. A study like *Barns matmot 2.0* can give new insight into the use of online resources for information and advice targeting diet, meals, and pedagogical activities in a kindergarten setting.

2 Aims and objectives

Based on the above-mentioned knowledge gaps, the overall objective of this thesis was to explore aspects of early diet in relation to food neophobia and neurodevelopment, and to promote healthy food habits through developing, implementing and evaluating the web-based kindergarten intervention *Barns matmot 2.0* in a cluster randomised controlled trial setting. This thesis is presented in two parts:

Part 1: To explore potential associations:
-between breastfeeding mode and duration and child food neophobia in one-year-old children.
-between aspects of diet, including breastfeeding, and neurodevelopmental score in one-year-old children.

Part 2: To develop and implement a web-based intervention with two graded levels targeting one-year-old children in kindergartens in Norway, aiming to promote healthy food habits, and to evaluate the effect of the interventions in a cluster randomised controlled trial setting.

The following research aims were specified for the four papers included in this thesis:

Paper 1: A cluster randomised web-based intervention trial to reduce food neophobia and promote healthy diets among one-year-old children in kindergarten: study protocol.
The aim of the study protocol was to describe the development of the study as well as the planned data-collection and implementation and evaluation of the web-based intervention.

Paper 2: Associations between breastfeeding mode and duration and food neophobia in toddlerhood. A cross-sectional study among Norwegian toddlers.

The aim of paper 2 was to investigate whether the duration of exclusive breastfeeding for four or six months, respectively, and the overall duration of breastfeeding were related to food neophobia in one-year-old children.

Paper 3: Diet and neurodevelopmental score in a sample of one-year-old children – a cross-sectional study.

The aim of paper 3 was to investigate whether breastfeeding and healthy food intake in infancy were associated with higher neurodevelopmental scores at the age of one year.

Paper 4: Effectiveness of a kindergarten-based intervention to increase vegetable intake and reduce food neophobia among one-year-old children: a cluster randomised controlled trial.

The aim of paper 4 was to evaluate the effect of the kindergarten intervention in a cluster randomised controlled trial setting.

We evaluated the effect on the following outcomes:

Child vegetable intake after the intervention.

Child intake of intervention vegetables after the intervention.

Level of child food neophobia after the intervention.

3 Materials and methods

3.1 *Study design*

This thesis includes development and implementation of the web-based intervention study *Barns matmot 2.0*, as well as data collection at baseline and post-intervention. The study uses a cross-sectional design exploring quantitative baseline data (part 1), and the design of a cluster randomised controlled trial (part 2).

3.1.1 Study design Part 1

In the first part of the study, we used baseline data from part 2 to investigate whether there was an association between breastfeeding duration and food neophobia, operationalised both as exclusive breastfeeding and any breastfeeding (paper 2) and to investigate whether breastfeeding and typical components of a healthy diet in infancy were associated with higher neurodevelopmental scores at the age of one year (paper 3).

3.1.2 Study design Part 2

The intervention *Barns matmot 2.0* draws upon elements from the theories mentioned in chapter 1.6.2, Social cognitive theory, and Social ecological model. On the individual level, the intervention should provide age-appropriate educational nutritional activities to the children in the form of sensory lessons with the opportunity to explore new food and food tasting without pressure. On the interpersonal level, the intervention aimed to provide staff with training through information videos and other information on the study web page, ensuring kindergarten staff's role modelling and positive behaviours, such as encouraging children to try bites of unknown food and enthusiastically model the eating of vegetables. On the institutional and environmental level, the intervention aimed to modify the food serving in the kindergarten while training

the staff in preparing new dishes with fresh vegetables. A more detailed description of the intervention elements is given below.

Development of the intervention

The intervention *Barns matmot 2.0* was inspired by an earlier intervention for two-year old children in kindergarten, called *Barns matmot – Preschoolers Food Courage,* developed by Sissel H. Helland and co-workers (161). The purpose of *Barns matmot 2.0* was to develop a similar intervention adapted to one-year-old children, before the onset of food neophobia, and to make all steps of the recruitment, the data collection, and the information digital. As outlined in the introduction chapter 1.7, there are various definitions of web-based interventions. Regarding *Barns matmot 2.0,* one of the main parts of the intervention was kindergarten staff serving vegetable dishes to the included children. However, all study content like the recipes, instructions regarding the lunch serving and sensory lessons and the educational material (information videos), as well as the questionnaires, was digitally delivered, thus we called it a web-based study.

Based on experiences from the previous study *Barns matmot*, the aim for the present project was also to make *Barns matmot 2.0* somewhat simplified and less time-consuming for the kindergartens (135).

Two password-protected study websites, one for each of the two intervention groups, were developed and designed solely for this study (figure 3 and appendix 1). The Division of communication at the University of Agder contributed to the websites' graphic design, as well as to the production of the information videos for the intervention group 2.

The intervention was designed as a cluster randomised controlled trial with two intervention groups and one control group as described below.

Testgruppe 1

Her finner du oppskriftene til prosjektet. Hver meny har oppskrifter til tre ulike retter som skal serveres på tre valgfrie dager i løpet av en uke. De andre to dagene kan dere servere det dere ønsker eller vanligvis pleier. Dere starter med meny 1 i uke 45 og serverer alle tre rettene hver uke i tre uker, før dere tar en ukes pause hvor dere kan servere det dere ønsker eller vanligvis pleier i barnehagen. Deretter går dere over til meny 2 i uke 49 og serverer alle tre rettene hver uke i tre uker, før dere tar to ukers pause (grunnet juleferie) før dere begynner på meny 3 som også serveres i tre uker.

Til hver meny finner dere tre korte evalueringsskjemaer. For å kunne si noe om tiltaket virker, er vi avhengig av å vite om barnehagen har laget og servert maten som står på planen. Fyll ut ett evalueringsskjema per uke ved å klikke på lenken på venstre side av menyen.

Før dere går i gang bør dere lese "Kjøkkenutstyr og basismatvarer". Det står også mye nyttig informasjon i "Bra mat i barnehagen" som dere kan se på når dere har mulighet. Vi oppfordrer særlig de som har ansvar for matlagingen i barnehagen om å lese kapittel 7 om hygiene ved matlaging og kapittel 8 om matallergier.

Meny 1

Her er menyen for første periode. Alle tre rettene skal serveres i løpet av en uke. Menyen serveres i tre sammenhengende uker.
Denne periodens fokusgrønnsak er spinat.

Evalueringsskjemaer
- Skjema for uke 1
- Skjema for uke 2
- Skjema for uke 3

Pasta med grønt

Stekt fisk med gulrotpuré

Spinat- og linsesuppe

Meny 2

Her er menyen for andre periode. Alle tre rettene skal serveres i løpet av en uke. Menyen serveres i tre sammenhengende uker.
Denne månedens fokusgrønnsak er sellerirot.

Figure 3: Photo of the front page of the website for intervention group 1.

Intervention element for both intervention groups

Kindergartens in both intervention groups were instructed to serve the participating kindergarten departments a warm lunch meal with alternating vegetables, three days a week during the intervention period that lasted for three months. Each of the three menus had one vegetable in focus, i.e., spinach, celeriac, and fennel (table 1), hereby referred to as intervention vegetables. At least 2 of the 3 recipes of the week included the intervention vegetable so that the children were exposed to the vegetable at least 6 times during the three weeks of each menu. (All three recipes of the week included a variety of vegetables.) Both the kindergarten staff and the parents of the registered children were given access to the website with the nine recipes (appendix 2). The website also included information on kitchen tools and basic ingredients that the kindergarten needed for the lunch preparing (appendix 3) and linked to a brochure called "Food in kindergarten". This brochure, written by the Norwegian Health Directorate

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contained relevant information about food allergies and food and kitchen hygiene.

Both intervention groups were offered a compensation up to 2000 NOK to buy necessary kitchenware such as a good knife, saucepans, or a hand blender. Only two kindergartens took advantage of this offer. Both intervention groups were also offered a subsidy of NOK 150 per child born in 2016 in the participating department, to cover some of the additional food expenses.

Table 1. Lunch dishes prepared in the intervention kindergartens.

	Vegetarian	Fish	Vegetarian
Menu 1 spinach	Pasta with vegetables and feta cheese (including spinach)	Pan fried fish with carrot purée	Spinach and lentils soup
Menu 2 celeriac	Celeriac soup	Salmon with celeriac purée	Vegetable stew (including celeriac)
Menu 3 fennel	Minestrone soup (including fennel)	Fish cakes with oven baked vegetables (including fennel)	Potato and broccoli omelette

The intervention vegetables

The three intervention vegetables in the project *Barns matmot 2.0*, spinach, celeriac, and fennel, were chosen to represent vegetables less commonly used in Norway, to increase the probability that the vegetables were new to the children. According to the Norwegian information bureau for fruit and vegetables, the most commonly used vegetables in Norway are tomato, carrots, onion, cucumber

and bell pepper (162). A recently published nationwide dietary survey among infants in Norway, revealed that the most commonly used vegetables among one-year-old children is carrots, tomatoes and avocados (10).

Although spinach is a micronutrient-rich vegetable, it contains nitrate which can be converted to nitrite. Nitrite prevents the transport of oxygen to the cells in the body, and infants are particularly at risk because of rapid absorption into the bloodstream (163). However, it is considered safe to give children spinach as part of a varied diet when the child is above 12 months. In the recipes for this project, the portions of spinach are small; 200 grams of spinach is divided into 8 portions.

Additional intervention elements for intervention group 2

In addition to the lunch serving, the kindergarten staff in intervention group 2 was instructed to implement pedagogical tools including weekly sensory lessons for the participating children (Sapere method) (127). Thorough information about the Sapere method and how to conduct the sensory lessons was provided by way of information videos and documents/leaflets on the study website (appendices 4 and 5). This material was only available for the kindergarten staff and parents in intervention group 2. The website also included information about meal practice and feeding practices during mealtime. Recommendations for meal and feeding practices were presented in short information videos on the study website. Participating kindergartens had access to five videos (appendix 5), lasting from just over a minute for the shortest video up to three minutes for the longest video. The videos included information about food neophobia and repeated exposure, role modelling, our five senses and the basic tastes, as well as information about the Sapere method with instructions on how to conduct sensory lessons. A box with necessary equipment for the sensory lessons was sent to all participating kindergartens in intervention group 2 (figure 4).

Figure 4: Pictures of the box with equipment for the sensory lessons.

The kindergarten staff needed to enter the website to find recipes and information about the sensory lessons of the month. Parents of the registered children in the

more intensive intervention group (group 2), received one email corresponding to each menu period, a total of three emails, where they were informed about the intervention vegetable of the month and encouraged to watch the information videos, as well as to have a look at the recipes of the month.

The control group

Kindergartens randomised to the control group were asked to continue their usual meal practices and did not get access to any information or web-based material. The kindergartens in the control group were offered a gift card for kitchenware worth NOK 2000 when the intervention period was over.

3.2 Study population

3.2.1 Sample size calculation

Sample size was calculated according to the outcome food neophobia. A previous cross-sectional trial of 505 toddlers in Southern Norway (94) resulted in a mean neophobia score of 18.2 (SD:9.3). We assumed that a mean score reduction in the level of food neophobia from 18.2 to 12.0 would be of public health impact. Using a power of 80 % and type 1 error of 5 %, this suggested 36 participants were needed in each group. To adjust for within-cluster variation we assumed an intra-cluster correlation coefficient of 0,1 and a design effect factor of 1,6 expecting 7 participants in each cluster (164). Based on these calculations we would need 58 participants in each group. Due to a probable loss to follow-up of participants of 20 per cent, we aimed to recruit 70 children for each of the three groups, a total of 210 children in this study.

3.2.2 Recruitment and randomisation

The recruitment of kindergartens started in May 2017, from all public and private kindergartens in four counties (Telemark, Oppland, Sør-Trøndelag and Møre og Romsdal) of Norway that met the overall inclusion criterion (n = 1043) having

children of the appropriate age (i.e., born in 2016). We selected four counties aiming to cover different geographical areas of Norway and included kindergartens located in both rural and urban settings. Kindergartens registered as "open kindergartens" in which children and their parents attend together (n = 18), kindergartens registered with less than four children (n = 7) and kindergartens with children from three to five years only (n = 12) were not invited.

The invitations were sent to the kindergarten managers by email and included detailed information about the study (appendix 6) and a link to the study registration web page (http://matmot.uia.no/). The kindergarten managers got one reminder email after a couple of weeks. Because few kindergartens (n = 32) registered for the study initially, a random selection of kindergarten managers (n = 321) were additionally contacted by telephone and asked if they had received the email and further asked if they could be interested in participating in the study. Due to the relatively narrow time frame for recruiting kindergartens, not all kindergartens (n = 1043) were contacted by phone, and the phone call recruitment were stopped when the number of kindergartens registered were assumed satisfying to reach the planned study sample size. In total, 48 kindergartens registered for the study, but two kindergartens were excluded shortly after registration because they appeared to have fewer than three children born in 2016.

The pedagogical leaders in participating kindergarten departments were asked to distribute an electronic invitation letter to the parents of children born in 2016 (appendix 7). The invitation provided information about the study and a link to the registration web page (http://matmot.uia.no/registrer-barn) where parents could read detailed information about the study (appendix 8) and register their child. Parents were informed that they consented to participation by registering their child. Inclusion criteria for child enrolment was that they had to be born in the year of 2016, and that at least one of the parents was able to read and

understand Norwegian. Parents could register their child for the study from late August 2017 until the end of October, two weeks before the intervention started in November 2017. All included children turned one year during the year of 2017 when the intervention was carried out, hence named "1-year-olds" or "one-year-old children". Baseline questionnaires were sent electronically to parents (appendix 9) and the pedagogical leaders of the participating kindergarten departments (appendix 10) shortly after registration and had to be completed electronically before randomisation. The kindergartens were then randomised to either the control group or one of two intervention groups (group 1 diet and group 2 diet + sapere). The intervention period lasted from November 2017 until February 2018. The post-intervention questionnaires were sent electronically to parents and pedagogical leaders immediately after the intervention period of three months (appendices 11 and 12).

3.3 Measures

A comprehensive questionnaire was developed specifically for this study. All measures and instruments which were included in the questionnaire are presented in detail in the study protocol (165). All measures relevant for the papers presented in this thesis are described below. Neurodevelopment was measured with a separate questionnaire (the Ages and Stages Questionnaire).

3.3.1 Measures of child food intake

Child food intake was measured by selected items from a food frequency questionnaire (FFQ) that has been validated and used in large national surveys among one- and two-year-old children in Norway (13, 166). The original FFQ is a semi-quantitative food frequency questionnaire (SFFQ) measuring both frequency of intake and portion sizes, including a photographic booklet with differently sized portions to help the parents in estimating the portion sizes. The SFFQ for 1-year-olds and 2-years-olds are practically the same questionnaire. All

questions regarding food intake are the same in both age-related SFFQs, they differ only in a few questions about breastfeeding and infant formulas. Validity of the original SFFQ for two-year old children has previously been assessed by comparing food and nutrient intakes from the SFFQ against intake from 7-day weighed records in a selection of 187 children (167). Validity of the original SFFQ for one-year-old children was also assessed by comparing results with a 7-day weighed record (split into two separate periods of four and three consecutive days) in a selection of 64 children (168). The SFFQ produced acceptable estimates for several food items and gave relatively good estimates for nutrient density intake.

In our study, we modified the questionnaire to measure only frequencies of intake and not amounts or portions of food eaten. Questions on how often the child was eating 15 different types of vegetables, or categories of vegetables (ex. "broccoli and cauliflower") was included, in addition to questions about berries, potatoes, pasta and rice, bread and cereals, spreads, drinks, warm meals, sweets and snacks. We added three extra vegetable alternatives, i.e., "onion and leek", "fennel" and "celeriac", in addition to the 12 types of vegetables in the original FFQ. Fennel and celeriac were, in addition to spinach that already occurred in the questionnaire, the three intervention vegetables in the study, therefore highly relevant to measure. The response options for intake of vegetables were never, <1/month, 1-3/month, 1-2/week, 3-4/week, 5-6/week, 1/day, 2/day, >3/day. The response options were re-coded into times per week before analysing the data.

Any breastfeeding was measured with the following question: 'How old was your child when he or she stopped being breastfed?' The responses included never breastfed, 1 week, 2 weeks, 3-4 weeks, 2 months, 3 months, etc., up to 12 months, and then older than 12 months and still being breastfed. If the child was still breastfed, the following question was how many times per day and night the child was breastfed. Exclusive breastfeeding was later calculated by first defining whether the child was breastfed in the given month, and then whether the child

had been introduced to any food or drink other than breastmilk in the given month. To be categorised as exclusively breastfed, the child had to only receive breastmilk without being introduced to other food or drink.

Since *Barns matmot 2.0.* was a web-based study, the original paper-based FFQ was transferred to a web-based dietary survey. The survey had mandatory responses, i.e., the participant was not allowed to proceed without ticking off the boxes for each question on each page.

3.3.2 Measures of child food neophobia

Child food neophobia was measured with a 6-item version of Pliner's 10-item Child Food Neophobia Scale (CFNS) (95). The CFNS is a validated tool which uses parental reporting of child neophobia. The questionnaire was originally developed for children aged 5-11 years and encompasses a behavioural test along with the food neophobia scale items. The instrument can also be used on its own without the behavioural test (98). Four items from the original CFNS are often excluded on the basis that they are regarded inappropriate for the younger children (169). The 6-item version of CFNS is commonly used to measure food neophobia in young children and has been used with children as young as two years (88, 92, 94, 169). The excluded items were: My child likes to eat in ethnic restaurants; My child likes foods from different countries; At dinner parties, my child will try different foods; Ethnic food looks weird to my child.

The six remaining items were:

1) My child is constantly sampling new and different foods (reverse scored).

2) My child does not trust new foods.

3) If my child does not know what is in a food s/he will not try it.

4) My child is afraid to eat things s/he has never had before.

5) My child is very particular about the foods s/he will eat.

6) My child will eat almost anything (reverse scored).

Responses were rated on the original 7-point scale from "strongly disagree" (1 point) to "strongly agree" (7 points), resulting in a total score between 6 and 42 points. The higher the score, the higher the level of food neophobia. No standardised cut-off values exist for classifying individuals as food neophobic. Neophobia is variously defined as scoring above a defined cut-off, either the mid-point of scores, or one or more standard deviations beyond the mid-point (170). The Norwegian version of the CFNS has previously been translated and published by members of our research group (94).

3.3.3 Measures of parents' socio-demographics

Parental marital status was assessed, entailing six response options: *single, married, cohabiting, separated, divorced* or *other*. The questionnaire included questions assessing the highest completed education of both parents with five response alternatives: *less than 9 or 10 years of primary school, primary school, secondary school or high school, university 4 years or less* or *university more than 4 years*. The work situation of the parent who answered the questionnaire was assessed with the following response alternatives: *work full-time, work part-time, «housewife", sick leave, leave, disabled, occupational rehabilitation, student, unemployed* or *other work situation*. In addition, parents entered their own age in years, and the parent completing the questionnaire entered his or her gender. Potential non-Norwegian descent of both parents was approximated by the question of whether they were born in Norway. Parents also reported their own weight in kilograms and height in centimetres.

3.3.4 Other baseline measures

Parents were asked to provide their child's date of birth, child sex, whether the child was born in Norway, and weight and length at 12 months of age as recorded in the child's health card, or weight and length from the most recent health control if the child was under the age of 12 months.

3.3.5 Measures of child neurodevelopment

Child neurodevelopment was assessed with the Ages and Stages Questionnaire (30). ASQ is a developmental assessment tool kit for parents who complete the questionnaire at prescribed intervals, covering the age-range of 4 to 60 months. Each questionnaire consists of 30 described and illustrated questions divided into five different domains: communication/language, gross motor, fine motor, problem solving and personal social skills. The scoring is "yes" (10 points), "sometimes" (5 points) and "not yet" (0 points), depending on the question whether the child has a certain skill or behaviour. The reading level that is needed to fill in the various questionnaires is grade 4-6, thus ensuring easy parental comprehension. While completing the questionnaire, the child must be together with the parent to try out certain tasks or activities. The questionnaire usually requires approximately 15 minutes to complete. The maximum score is 60 points per domain, i.e., a total of 300 points maximum. The ASQ questionnaire has been widely used in both clinical and research settings in several countries (171, 172). The Norwegian version of ASQ has been validated and compared with US normative data (172, 173). The ASQ was made electronic by transferring questions and their corresponding pictograms (drawn illustrations) to a web-based survey. The original Ages and Stages Questionnaire also includes seven open-ended questions eliciting parental concerns. These questions are intended for health professionals in a clinical screening setting and were not included in our study.

Ages & Stages Questionnaires® is a registered trademark and is subject to copyright. The Norwegian start-kit is bought from RBUP (Regional Centre for Child and Adolescent Mental Health Eastern and Southern Norway). Some sample questionnaires are found on their website https://www.r-bup.no/no, and sample questionnaires of the original ASQ in English is found on the website https://agesandstages.com/.

3.3.6 Measure of the kindergartens' compliance to the intervention elements

Weekly evaluations of the kindergarten's compliance with the intervention elements were included in the study webpage, next to the menu plans. The kindergarten teacher in each of the participating departments was instructed to fill in these short evaluation forms at the end of each week. A link to the compliance score was found right next to the weekly lunch menu on the intervention webpage. For both intervention groups there was one question about whether the kindergarten department had complied with this week's specific lunch plan. For intervention group 2 there was an additional question about whether the kindergarten department had conducted the weekly sensory session as planned. The answers were graded on a Likert scale from 0 (not carried out) to 10 (carried out as planned). If either the menu or the sensory lessons were not carried out completely as planned, there was an open space where they could write what was deviant, for instance "we did not get baby spinach for the sensory lessons but used regular spinach instead" or "we managed to cook only two out of three dishes this week due to sick leave among the staff".

3.4 The ethics of participation

The study *Barns matmot 2.0* was conducted in accordance with the Helsinki Declaration (174). The Norwegian Centre for Research Data evaluated and approved the study (appendices 13-14). The study was registered in the Clinical Trials Registry in May 2017 with trial registration number: ISRCTN98064772. ISRCTN short for International Standard Randomised Controlled Trial Number. Informed consent was obtained electronically from all kindergarten managers when registering their kindergarten for the study, and from parents of all participating children when registering their child for the study (appendices 6 and 8).

3.5 Statistical analyses

Data analyses were performed using SPSS Statistics, version 24.0 and 25.0, and Stata version 15.1. Statistical analyses are presented as they appear in the papers below. There was no use of statistics in paper 1 (the study protocol).

Paper 2

Comparisons of food neophobia scoring between children being breastfed or exclusively breastfed and not breastfed at different ages were analysed by two-sample t-tests. Crude and adjusted linear regressions were performed regarding associations between breastfeeding duration (both any and exclusive breastfeeding) and food neophobia scoring. Duration of breastfeeding was included in the model as age-specific dichotomous variables with a cut-off (still breastfeeding or not) at the given month (6 to 12 months for any breastfeeding, respectively, and 3 to 6 months for exclusive breastfeeding). Adjustments were made for maternal education and parental food neophobia scoring. An additional analysis was conducted with any breastfeeding as exposure, using breastfeeding as a continuous variable (weeks of breastfeeding). We also performed additional analysis of the association between food neophobia and breastfeeding with breastfeeding (any and exclusive) categories.

Paper 3

Associations between dietary factors and ASQ-scores were explored using crude and multivariable linear regression with individual dietary factors as exposure and ASQ-scores as outcome. We adjusted for child sex and potential covariates such as child age and educational status of both parents into the model. We also fitted a model where breastfeeding was included as a covariate together with the above-mentioned covariates.

Paper 4

Since the outcomes were collected from a self-reported questionnaire, there was some loss to follow-up meaning that a full intention-to-treat (ITT) analysis could

not be performed (175). All analyses were done on the complete cases since no new information can be gained from multiple imputation when only the outcome data are missing and there are no available auxiliary variables related to the missingness (176). However, to address any imbalances that may have resulted from the cluster design and losses to follow-up, we presented a set of adjusted effect estimates, controlling for the baseline values of each outcome, and maternal and paternal education.

To evaluate the effect of the intervention on vegetable intake, we performed regression analyses. For all inferential analyses, standard errors were corrected for the cluster design with a robust cluster estimator. Negative binomial models were fitted to estimate the effect of the intervention on the count outcomes of total vegetable intake per day and intervention vegetable intake per week. Poisson regression was used for the binary total vegetable intake outcomes and the intervention vegetables intake outcomes. Poisson was preferred over logistic because the outcomes were relatively common and hence, in this scenario, risk ratios are much easier to interpret than odds ratios (177, 178). Linear regression was used for estimating between-group intervention effects on the continuous outcome variable child food neophobia score. Since the distribution of CFNS was highly skewed and a log transformation had little effect on its shape, to check the robustness of our analysis on CFNS, we also fitted an ordinal logistic regression model as a sensitivity analysis, splitting the outcome into three categories of food neophobia scoring (<10, 10-19, 20+), where the middle group approximately captured the middle 50 % of the sample at baseline.

In addition to the statistical analyses, an intervention compliance score was calculated for this paper. The individual scores of compliance (0-10) with the intervention elements (warm lunch serving and sapere lessons) were added and divided by the number of times assessed, leading to a mean score for each intervention element.

4 Main results

Paper 1

A cluster randomised web-based intervention trial to reduce food neophobia and promote healthy diets among one-year-old children in kindergarten: study protocol

The study protocol describes the rationale for the study and its outcomes, the development of the intervention, the study design and measurement instruments, as well as the recruitment of participants (165). A total of 267 children from 46 kindergartens were registered by their parents for the study, whereof 246 parents answered the questionnaire at baseline. This constitutes the baseline data for all the following papers.

Paper 2

Associations between breastfeeding mode and duration and food neophobia in toddlerhood. A cross-sectional study among Norwegian toddlers

In this paper we used baseline data from the study to evaluate the association between any breastfeeding duration and food neophobia, and exclusive breastfeeding and food neophobia in young children (179). The mean age of the children was 16.3 months, ranging from 10 to 24 months. Forty-eight per cent were girls. The mean parental age was 30.9 years, and 89% of those filling in the questionnaire were mothers. More than 90% of the parents were living together at the time of inclusion. Most of the mothers had higher education, while more than 40% of fathers had higher education. Most parents were born in Norway. The mean child food neophobia score was 14.3 (SD 7.1), whereas the parental score was 23.6. Most of the children were still breastfed at 6 months (71%), while only 10% were exclusively breastfed until 6 months of age.

Results from the adjusted models (adjusted for maternal education and parental food neophobia score) showed that the children who were breastfed for 12 months or longer had significantly higher food neophobia score (1.9 points higher) than those who were breastfed for a shorter period (p = 0.049). Food neophobia scoring was also significantly higher (2.2 points higher) among those exclusively breastfed for 5 months or more compared to those exclusively breastfed for a shorter period (p = 0.039).

Paper 3

Diet and neurodevelopmental score in a sample of one-year-old children – a cross-sectional study

In this paper we used baseline data from the study to investigate associations between dietary factors including breastfeeding and a measure of neurodevelopment (ASQ-score) in one-year-old children (180) . Among the children included in the trial at baseline (n = 246), 47.6% were girls, and the children's mean age was 16.7 months. Among the parents who completed the questionnaire, 88.6% were women. The parents mean age was 31.2 years, and 90.5% were born in Norway. Most parents were living together (94.3%), and 63.8% of the mothers and 42.3% of the fathers had higher education (University or College). The child mean ASQ total score was 235.3 (SD 37.4). The children's mean intake of vegetables was 20.3 times per week (SD 11.3), fresh fruits 17.0 times per week (SD 10.7) and that of all fruits and vegetables was 40.5 times per week (SD 19.9). The mean intake of lean and fatty fish was 2.1 times per week (SD 1.3) and that of total fish and fish products including fish as a spread was 5.9 times per week (SD 3.7). The mean intake of unprocessed meat was 2.2 times per week (SD 1.8), while that of all meat and meat products combined (including processed meats and spread) was 10.1 times per week (SD 4.4). The mean intake of wholegrain products was 11.7 times per week (SD 5.0) and that of typical sugary foods was 3.9 times per week (SD 3.7). The mean duration of

breastfeeding was 33.3 weeks (SD 18.4), corresponding to approximately 8 months.

A total of 212 one-year-old children, i.e., those with completed questionnaires on both dietary factors and ASQ-score, were included in the main analyses. The ASQ total score was significantly associated with the duration of breastfeeding (in weeks) (β 0.42, p = 0.004). Dietary intake of fish, fruits and vegetables was also associated with higher neurodevelopmental scores, even after adjustment for breastfeeding and maternal and paternal education. The largest effect sizes with the ASQ score in the fully adjusted model was observed for fish intake (β 3.90, p = 0.049) and intake of vegetables (β 0.88, p < 0.001). An increase of one serving of fish per week translated into a four-point higher ASQ score. An additional serving of vegetables per day translated into a six-point higher ASQ score (0.88/week × 7 days = 6.16).

Paper 4

Effectiveness of a kindergarten-based intervention to increase vegetable intake and reduce food neophobia among one-year-old children: a cluster randomised controlled trial

In this paper we reported the intervention effects on the outcomes total vegetable intake, intake of intervention vegetables and level of food neophobia (181). Of the children included in the trial at baseline (n = 246), 47.6% were girls, and the children's mean age was 16.7 months. The children's total frequency of intake of vegetables at baseline was a median of 19.2 times per week, and intake of the three intervention vegetables was a median of 0.1 times per week. The kindergarten's mean intervention compliance score for the warm lunches high 9.1 (0.9), and the mean score for the sensory lessons was 8.8 (1.2), suggesting that the compliance to the intervention elements was good.

The parents of 144 one-year-old children completed the questionnaires both at baseline and post intervention and were included in the main analysis. The results suggested a higher intake of the three intervention vegetables in group 2 (diet + sapere) relative to the control group. There was a weak suggestion that the diet intervention increased total vegetable intake, but the results were inconclusive. We were not able to detect an effect of the intervention on the level of food neophobia.

5 Discussion

The project *Barns matmot 2.0* aimed to explore aspects of early diet and to promote healthy dietary habits from early childhood through a web-based multi-component intervention in kindergartens. In this chapter, important methodological aspects of the study design will be considered before highlights from the study's main results are discussed. Lastly, ethical considerations and future perspectives will be debated.

5.1 Methodological considerations

5.1.1 Study design.

The present project uses both a cross-sectional design exploring quantitative baseline data (part 1), as well as a cluster randomised controlled trial design (part 2).

Cross-sectional studies are characterised by the collection of information at a given point in time (182). Cross-sectional studies may be used for explorative purposes, assessing potential exposure-outcome associations. Care needs to be taken in the interpretation of the findings, as causality never can be inferred from cross-sectional data, even when potential confounders are carefully controlled for.

The study *Barns matmot 2.0* was not originally designed to be a cross-sectional trial but planned as a longitudinal intervention study as described in the study protocol (165). During the data collection process, we experienced that drop-out became much larger than expected and that our data probably would lack power to detect the hypothesised effects of the trial. The large loss to follow-up forced us to rethink the planned follow-up of the participants at age 3 and 4 years. We therefore decided to use the more comprehensive baseline data to explore associations that were scarcely described in the literature.

Self-selection may introduce selection bias and influence the validity of the results; however, this reduces, first and foremost, the generalisability of the prevalence estimates of various exposures and outcomes, not so much the estimates of exposure-outcome associations (183).

The randomised controlled trial (RCT) is the most rigorous and robust research method for determining whether a cause-effect relation exists between an intervention and an outcome (184). Randomised controlled trials is typically called the "gold standard" of experimental methods in medical research (185). RCTs are also used as a method to evaluate public health interventions. In a randomised trial, the target population is typically split in two groups, one intervention group and one control group, but one can also split the study population in more than two groups. Our study was two-armed and administered in clusters, i.e., each kindergarten represented one cluster which was randomly placed in either a control group or one of two intervention groups as described in the methods section. The randomisation is meant to distribute possible confounding factors evenly between the control group and the experimental group(s) to avoid skewed results. While RCTs might not distribute all confounders evenly in the test and control groups, they are less confounded and less biased than other sorts of evidence such as observational studies or anecdotal evidence (185). Each group will be generally balanced in all characteristics, with any imbalance occurring by chance. Our sample was quite well balanced at baseline, which indicated that the cluster randomisation produced groups that were broadly comparable (181).

Randomised trials typically include all randomised subjects in the analysis regardless of whether he or she adheres to the protocol, in line with the intention-to-treat principle (ITT) (175, 186). ITT analyses estimate the effect of being assigned to an intervention rather than that of receiving it (175, 187). However, during many trials, participants are lost to follow-up. Such attrition prevents a

full intention-to-treat analysis being carried out and can introduce bias if the characteristics of people loss to follow-up differ between the randomised groups (188). A large loss to follow-up is why we could not perform a full intention to treat analysis on our data in paper 4 (181). The loss to follow-up is further discussed in chapter 5.1.2. Recruitment and study sample.

Kindergarten interventions to promote healthy diets in children have been performed in Norway earlier, such as the precursor of this study, *Barns matmot – Preschoolers food courage* (161), and the BRA-study (189) aiming to improve vegetable intake among preschool children, but this present study was the first study to use web-based technology in all phases of the implementation of the intervention. The overall web-based design made the intervention easy to administer to the kindergartens and it has the potential to reach many kindergartens nationwide with low costs and low degree of personnel resources if desired. To administer all information through a study website like the one developed for this study ensures that all participating kindergartens get the same information in a similar way. In studies where information and instructions are given face-to-face, one risks obtaining different results based on differences between the persons that conveys the study information.

The intervention
The precursor of this study, *Barns matmot -Preschoolers Food Courage,* by Helland et. al found in their qualitative analyses that the kindergartens experienced the cooking of novel foods as time consuming and left less time for other tasks (135). Another experience from the mentioned study was that many kindergarten teachers felt that to conduct sapere sensory lessons three times a week was too much. In planning this present intervention, we wanted to make the recipes and dishes less complicated and time-consuming so that also kindergarten staff with relatively low cooking skills could manage to carry out the intervention menus. We also limited the sensory lessons to one lesson a week. Qualitative data from this present study (interviews with kindergarten teachers) are analysed

and a paper regarding these results is currently under review (190). The results show that in general, kindergarten teachers described being part of the intervention as interesting, educational and a positive experience. They were surprised by how the intervention increased the children's food acceptance and felt they could include the intervention strategies in their educational practices (190).

Regarding food choice, we chose to focus on vegetables for this study. It seems easier for both children and adults to achieve an adequate fruit intake compared to that of vegetables (10, 191). This can partly be explained by the bitter components in vegetables, which children tend to reject. Furthermore, children with food neophobia tend to have a low intake of vegetables, so targeting vegetables in interventions to reduce food neophobia and promote healthy diets seems reasonable. Also, Glasson et al. argues that interventions should have a greater emphasis on vegetable than fruit consumption, because knowledge, consumption and correct perceptions about vegetable intake are much lower than for fruit (192).

One important learning process when young children learn about food during the weaning period and early childhood, is the recognition or familiarisation through repeated exposure with taste, texture or vision (193). Another key learning process is observing and imitating other people's eating behaviour (193). With the study *Barns matmot 2.0* we aimed to explore learning strategies which can result in that young children develop less scepticism to new food and instead begin to prefer and eat healthier foods, in this occasion vegetables. For that purpose, we choose the strategies of repeated exposure, role modelling and sensory experience.

According to the studies by Ahern et al., Caton et al. and Hausner et al., also mentioned in the introduction chapter, three to five exposures were assumed to be sufficient to increase intake of an exposed food in young children up to four

years of age (109, 112, 113). For the study *Barns matmot 2.0* we chose to aim for at least six exposures of each of the intervention vegetables in the lunch menu during the intervention period. In the more intensive intervention group, with Sapere lessons, the children potentially had nine exposures in total of each vegetable. In hindsight, we could have chosen to include the intervention vegetable in all the three dishes of each menu to increase the number of exposures even more, but we cannot know whether an increased number of exposures would have increased the vegetable intake in the participating children.

As outlined in the introduction chapter, extensive research has been performed regarding repeated exposure and modelling or observational learning as strategies to influence young children's food intake and have been found to be effective (193). Oppositely, the Sapere method is largely overlooked by researchers. Those who have explored it, however, report that parents and kindergarten teachers evaluate the method very positively, in part due to its ability to stimulate preschoolers' curiosity about food (194-196). During the last decade, some research has shown that allowing children to touch, smell and play with new food makes preschoolers more willing to try and taste them (124, 125, 197, 198). In this present intervention, allowing the children to explore the new foods in the Sapere sensory lessons, without being forced to taste, may have contributed to curiosity and children willing to try and taste the food. The Sapere sensory lessons was based on a sensory education originally directed to school children (127). Similar versions of this sensory education, adapted to younger preschool children have been used in kindergartens in Sweden and Finland (199, 200), but has not yet been a subject to extended research. The experiences from our study suggest that the Sapere sensory lessons can be successfully adapted to as young children as one year old (190).

Kindergarten as a setting to influence food preferences and promote healthy diets

Mothers' food likes and dislikes influences which foods they offer to their child (201, 202). Given the premise that children learn to like the foods they are offered repeatedly, kindergartens are an important contribution to the development of children's food preferences, especially since not all children are exposed to a variety of foods in their homes. The kindergartens can contribute with both repeated exposure to a variety of foods and peer and teacher modelling. Kindergartens also offer a good environment for sensory-based education with pedagogically skilled personnel. In addition, since almost all Norwegian children attend kindergarten, interventions in kindergarten may also contribute to a reduction in social inequality in diet and health. Thus, the kindergarten setting was considered to be a useful arena to influence children's food preferences and promote healthy diets.

5.1.2 Recruitment and study sample

The 43 kindergartens that participated in the study were from four counties in different parts of Norway. Both large and small, private, and public kindergartens were represented from both urban and rural areas. This geographic diversity and size diversity of kindergartens may have enhanced the generalisability of the study sample. The participating children and their parents were recruited by the kindergarten staff in those kindergartens whose manager already had consented to participate in the study. The pedagogical leaders in the participating departments were asked to try and recruit all the children in their department which was born in 2016, independent of socioeconomic status, parental age, or educational level. The fact that the parents were only asked to complete questionnaires, while the kindergarten staff in the participating departments had to do the tasks necessary to implement the intervention may have reduced a potential selection bias attributable to participant burden.

Those who volunteer for research tend to be female, more educated and with higher socioeconomic status (203-205). In our study, the parents could choose whether the questionnaires should be completed by the child's mother or father. There was a large predominance of mothers (89 per cent) who responded to the questionnaires on behalf of the participating children, the majority being highly educated (179, 180). The education level in Norway is high, and higher among women than men, so the sample of mothers was quite representative for the general female population in Norway, with 63.9 per cent of the mothers being highly educated (university or college), compared to 59.6 per cent of women in the age between 30 to 34 years in the general population (206). As mothers without a higher education were more likely to drop out of the study, we adjusted for parental education in the analyses.

There are limitations that should be considered. The recruitment of kindergartens turned out to be quite difficult. Recruiting participants for randomised trials is a well-known challenge, and it is estimated that less than 50 per cent of trials meet their recruitment target (207). Regarding this present study, one may speculate that the kindergarten managers were reluctant to enrol in a study that required quite a lot of involvement and effort from the kindergarten staff. However, the sample size reached at baseline (246 participants) was higher than the number we aimed for (210 participants). One obvious challenge was the loss to follow-up which was larger than expected. Sample sizes are inflated for expected attrition or non-response and this is commonly set at 10-20 per cent (208). For the study *Barns matmot 2.0* we calculated for a probable loss to follow-up of participants of 20 per cent. The relatively larger loss to follow-up than expected (41 per cent) may not only have led to biased results, but also to an underpowered study. This means that even clinically relevant between-group differences may be deemed statistically nonsignificant (207).

One reason for the large loss to follow-up may have been because the questionnaires were quite comprehensive and relatively time-consuming for

parents to complete. In addition, the parents may not have felt adequately involved in the study to feel obligated to complete the questionnaires at follow-up, despite emails with adequate updates during the intervention (only to the intervention group 2 sapere + diet), and reminder emails to complete questionnaires after the intervention was over (all three groups). A Cochrane review of strategies to improve retention in randomised trials found that monetary incentives can increase postal and electronic questionnaire response (209). In our study, the parents were not offered monetary incentives themselves, but they were informed that the kindergartens in the control group were offered a gift card after follow-up, and that the kindergartens in the intervention groups were offered support to upgrade their kitchen utensils, as well as a subsidy to cover some of the extra expenses to buy the food necessary for the intervention menus. We can only speculate if giving the parents monetary incentives to complete the questionnaires would have increased the response rate.

When writing the study protocol, we planned for a longitudinal trial with follow-up questionnaires when the children turned three and four years old, but because the drop-out turned out to be much higher than expected we chose not to continue with further follow-up.

5.1.3 Assessment methods

The questionnaires were web-based, and possible to fill out via a smartphone as well as on a computer. The questionnaires were quite time-consuming and demanding to complete. In hindsight, we could probably have reduced participant burden in shortening the questionnaire, leaving out questions not necessary for the main analyses. The findings of our study are based on parents' self-report, which may have its weaknesses as self-reported data entail a risk of bias (210). This is discussed further in the following section about dietary assessment.

Dietary assessment

All self-reported dietary data are challenged by potential systematic and random measurement errors, resulting in a gap between the observed or measured value and the true value. Food frequency questionnaires (FFQs) are frequently used for measuring intake in large observational studies because they are simple, quick and reliable tools compared with other more time-consuming dietary assessment methods (211). FFQ is a retrospective dietary assessment method that is prone to recall bias as it depends largely on the participants' memory. Self-reported dietary data have therefore been subject to heavy criticism, and some academic communities even state that data extracted from memory-based methods are pseudoscientific and should not be used to inform public policy or establish dietary guidelines (212, 213). Others argue that numerous validation studies comparing FFQs with different gold standards, including objectively measured biomarkers and metabolomics, have shown acceptable correlations as to be used in epidemiologic research (214, 215). Overall, dietary measurement error causes associations to be underestimated, which may lead to a failure to detect important diet-health outcome associations that exist, especially if they are small (216). Even though FFQs may not be the best method to measure energy intake, FFQ is a reasonably good method to measure both frequently eaten food items and more episodic intake of food items, and it can be an adequate method for ranking individuals in categories according to food intake (217).

In the present study, the frequency of vegetable intake at baseline was quite high, a median of almost three times per day. Others have reported an overestimation of vegetable intake by the use of FFQ, perhaps caused by a social desirability bias (218). Social desirability bias refers to the tendency to respond in such a way as to avoid criticism, while social approval bias refers to the tendency to seek praise, which are both well-known challenges within nutrition research (210, 219). However, despite a high reported vegetable intake in our study, the numbers may still be a correct measure of the frequency of vegetable intake during the day, but the amounts eaten of each vegetable do most likely not

correspond to three full vegetable portions per day, which in fact is higher than the recommended intake of vegetables. It is possible that high-frequency users consume very small amounts each time, and the opposite, that low-frequency users consume larger amounts each time. Hence, we cannot exclude the possibility that the intervention resulted in higher total intake of vegetables through increased portion sizes without affecting frequency of intake to the same degree. An extra focus on measuring vegetables, due to an extended number of vegetables included in the FFQ, may also contribute to a high reported intake of vegetables, as have been reported earlier by Krebs-Smith et al. and Kristiansen et al. (189, 220). However, as the same FFQ were used at baseline and post intervention, it is likely that such potential errors were in the same directions at both time points.

It can be difficult for the parent to report their child's food intake since the child eats many of his/her meals in kindergarten. Most kindergartens in Norway have systems to convey to the parents what the children is offered to eat during the day, especially for the younger children, but this will of course be nothing more but imprecise estimates of type and amount of food eaten, and the practice of communicating the food intake to the parents will differ between kindergartens. However, the validation study of the original FFQ for two-years-olds indicated that even if the children are staying in day care the parents seem to be able to report the diet of their child (167).

The modified FFQ that we used in our study *Barns matmot 2.0.* was not validated in its current form. We cannot be sure if this modified FFQ measured what we really wanted to measure. Ideally, we should have validated the FFQ against a method with uncorrelated measurement errors, such as a food record. However, the consistency in the reported vegetable intake from baseline to post intervention in the control group, showing no significant changes, indicates that the reproducibility of the used FFQ was good. Besides, by making the questions mandatory in the web-based survey we avoided the possible challenge with

incomplete recordings and missing data, which is likely to occur in paper-based FFQs.

One of the strengths with using an FFQ, is that it may capture foods that are eaten seldom. In our study we had a focus on three specific vegetables; spinach, celeriac, and fennel, which are relatively seldom eaten among children in Norway. A dietary record of four or more days, or even repeated 24-h recalls, would probably not have captured the intake of these three vegetables. We considered a short FFQ, without details of quantity, suitable for use in our study since we primarily wanted to measure vegetable variety, frequency of vegetable intake, and whether certain types of vegetables were eaten, rather than the total amount of food or energy and nutrients in the children's diet.

Child Food Neophobia Scale

Level of food neophobia was measured with Pliner and Pelchat's Child Food Neophobia Scale (CFNS) (95). The CFNS is so far the most used instrument to measure food neophobia, but it has lately been criticised of being both outdated and not specific for food neophobia (65, 96, 221). Neither of these three papers referred to were published when this present study was planned. Damsbo-Svendsen et al. (2017) reviewed instruments developed to measure food neophobia and pointed out that the CFNS was developed more than 20 years ago, and that some of the questions may not reflect food neophobia currently, i.e., the questions: My child likes to eat in ethnic restaurants; My child likes foods from different countries; At dinner parties, my child will try different foods; Ethnic food looks weird to my child (96). However, these four questions are often excluded when measuring food neophobia in children, leaving the 6-item scale used in *Barns matmot 2.0*, which is described in detail in the methods chapter.

The CFNS was originally developed for children aged 5-11 years old, however, the instrument has been used for research in children as young as 2 years old (88, 92-94, 169). To the best of my knowledge, the CFNS has not been subject to

validation studies in this age group, except from a relatively recent study by Zou et al. (2019) where they successfully adapted and validated the Chinese version of the CFNS for use in toddlers aged 12-36 months (222). As mentioned in the introductory chapter 1.4.4., Damsbo-Svendsen et al. found that the Children's Eating Behaviour Questionnaire (CEBQ) appeared to be the best instrument to investigate early signs of food neophobia, since it was developed for 2-9 years old children, while the CFNS by Pliner and Hobden appeared to be a reliable instrument to assess food neophobia from the age of 5 (96). More research on adequate instruments including relevant items to measure food neophobia in the younger children aged 1-5 years are needed, especially since this is the age group when the food neophobic behaviour begins to develop and peaks.

Child picky eating and food neophobia are often considered as two separate eating behaviours, which fall under the umbrella of selective eating (54). However, Fernandez et al. found that observationally measured child eating behaviours with familiar and unfamiliar vegetables did not differentiate maternal reported picky eating from food neophobia (221). This is supported by the work by Smith et al., which found that picky eating and food neophobia are strongly correlated and may share similar etiologies (65). Picky eaters reject familiar foods based on their sensory properties and this reaction could be expressed as the distaste or aversion for foods, rather than the anxiety or fear characterising the food neophobic response. The CFNS includes two questions "My child is very particular about the foods s/he will eat" and "My child will eat almost anything" (reverse scored), which is more characteristic for pickiness rather than neophobic behaviour. One can therefore argue that the CFNS measures both traits and is not specific to food neophobia. The same can be said about the CEBQ food fussiness scale which includes questions like "My child refuses new foods at first", "My child is difficult to please with meals", and "My child enjoys a wide variety of foods", and therefore relates both to neophobia, pickiness and general fussiness (97).

What also should be considered when interpreting the results from this study is that parental reports of food neophobia were used. Interpretations of neophobic behaviours may have varied among parents. Furthermore, self-reports are prone to bias, as already outlined in the section about dietary assessment above.

ASQ as measure of neurodevelopment

To measure neurodevelopment, we used the total ASQ-score, summing scores from five different developmental domains. As reported in previous studies, total ASQ-scores provide a global evaluation of a child's functioning (171, 223, 224).

A web-based version of the ASQ was distributed during the revision for the third edition, ASQ-3 (225). The ASQ-3 Technical report presented few significant differences between web-based and paper-based questionnaires, indicating no consistent pattern between the completion methods (226). The online version of the ASQ is not translated to Norwegian and made accessible for use in either a clinical or a research setting in Norway. For the study *Barns matmot 2.0.* the Norwegian version of the ASQ were made electronic by transferring questions and their corresponding pictograms to a web-based survey. To the best of my knowledge, our study is the first to use a web-based version of the original ASQ including all five domains in a research trial, except from the validation studies by the ASQ authors (226, 227).

Some earlier studies, using the ASQ as a measure of child development, have simplified the questionnaire, for instance using it without pictograms, without prompts to try the activity with the child, or using shortened versions with only few questions or selected domains (228-230). Valla et al. concluded that it seems important to use the correct published version (230). A considerable strength of our study is that we included all the prompts and pictograms which are in the original questionnaire so that our electronic version was identical with the original paper-based version. The ASQ was developed and validated with the use of pictograms which explain the tasks in the questionnaire, as well as prompts to

try the activities with the child. Using the original questionnaire with prompts and pictograms is therefore a great advantage to secure the validity of the results.

5.2 Discussion of the study's main results

The main findings of the project *Barns matmot 2.0* were that exclusive breastfeeding for more than 5 months and any breastfeeding for 12 months or more is associated with higher levels of food neophobia in one-year-old children, that dietary factors are associated with neurodevelopmental score in one-year-old children, and that a web-based intervention in kindergartens to reduce food neophobia and promote healthy diets may increase the intake of intervention-targeted vegetables, but due to a large proportion of missing outcome data other effect results were inconclusive. Detailed discussions of the specific results obtained are included in the papers. This chapter presents a more general discussion of the main findings.

5.2.1 Breastfeeding and neophobia

As previously mentioned, a healthy diet in childhood is crucial for a child's development, growth, and future health. During the first months of life the infant transitions from a milk-based diet to a more varied diet of solid foods. There are similar recommendations on breastfeeding all over the world, and the advantages of breastfeeding are abundant. However, there have been little research on the potential influence of breastfeeding mode and duration on the levels of child food neophobia, and the findings are inconclusive. In Norway, there has been a debate about whether children should be exclusively breastfed for 4 or 6 months (231, 232). One of the main issues that has been discussed is whether prolonged exclusive breastfeeding would reduce new food acceptance (7, 231). In the study *Barns matmot 2.0* we found that those who were breastfed for 12 months or longer had higher levels of food neophobia at 16 months of age than those who were breastfed for a shorter period. The food neophobia score was also higher among those exclusively breastfed for 5 months or more compared to those

exclusively breastfed for a shorter period. In contrast to our findings, Shim et al. (2011) found that children who were exclusively breastfed for 6 months had lower odds of having food neophobia, and that children introduced to complementary foods before 6 months of age were 2.5 times more likely to exhibit food neophobia than their counterparts (81). Finistrella et al. (2012) found that feeding mode and weaning age did not influence preschoolers' neophobia and pickiness (85). This is in line with the findings of Russell et al. (2008) and Cole et al. (2017) which found no relationship between food neophobia and history of breastfeeding (70, 89). Our results may inform the debate on optimal timing of complementary feeding, but should, given the cross-sectional nature of the study, be interpreted with caution. However, the results can contribute to generate hypotheses for further research on the possible influence of breastfeeding mode and duration on food neophobia and food acceptance. More research on such associations should be performed, as similar findings may have implications for the advice on exclusive breastfeeding duration.

The taste exposure through mother's milk will differ according to what food is eaten. Could it be that the flavour variation in a mother's breastmilk is of less importance compared to exposure to food variety at this age, and that a potential benefit of being breastfed on later food neophobia is overruled by less sensory exposure to complementary foods? It seems that the relation between milk feeding mode, complementary feeding and food acceptance is complicated. Harris and Coulthard (2016) suggest that a combination of breastfeeding with the timely introduction of a variety of tastes and food textures has the best effect on acceptance of new foods and will be the best strategy for developing child acceptance of foods such as fruit and vegetables (233). de Barse et al. (2017) suggest that the timing of complementary feeding is more relevant for fussy eating than is breastfeeding duration. They found that introducing vegetables into a child's diet between 4 and 5 months could protect against fussy eating (234). This is in line with Lange et al. (2013) who found that the earlier vegetables were introduced, the higher the acceptance of new vegetables was (235). These results

support the assumptions that both breastfeeding and early introduction of a variety of foods are important for later food acceptance. To exploit both the advantages of breastfeeding and at the same time, the advantages of an early diet with healthy foods such as fruits and vegetables does not need to be a contradiction.

5.2.2 Diet and neurodevelopment

Exploring the baseline data of *Barns matmot 2.0* we found that both longer duration of breastfeeding and higher frequencies of intake of fruits, vegetables and fish were associated with a higher neurodevelopmental score in one-year-old children. Previous studies, such as the French EDEN study, the Rhea study form Greece and the Mother's and Children's environmental Health (MOCEH) study from Korea have also found positive associations between breastfeeding duration and better neurodevelopmental outcomes (236-238). Studies finding no such associations, argues that sociodemographic factors and maternal IQ can explain the association between breastfeeding and neurodevelopment (239, 240). In our study, we did not have information about the mother's IQ, but we did adjust for both parents' educational level. One explanation of the relationship between breastfeeding and neurodevelopment is that breastmilk provides the nutrients required for brain development, such as lipids, complex proteins and carbohydrates, as well as vitamins, minerals and other biologically active components (36, 241). In addition, it is suggested that the physical and socioemotional contact between mother and child during breastfeeding can influence neurodevelopment (38).

Beyond breastfeeding, we also found that consumption of fish, vegetables and fruit and berries was associated with higher neurodevelopmental scores. There may be several mechanisms through which various aspects of a healthy diet are related to neurodevelopment, such as the content of fatty acids and iodine in fish, which are nutrient important for brain development (242, 243). Further, fruits

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and vegetables provide a broad range of micronutrients, both well-known and studied nutrients like carotenoids and vitamin C, as well as a probable combination of micronutrients and phytochemicals we yet not know the importance of (244, 245). All these substances in fruits and vegetables may have important roles in a child's development. Some previous studies have found similar positive associations between early diet and later cognitive development or academic achievement, such as the Australian Raine study (43, 44). However, these studies have been performed on older children. There are few studies comparable to this present study, evaluating early diet and neurodevelopment in children as young as one to two years in an industrialised country. Due to the nature of the FFQ we did not have the possibility to adjust for energy intake in the models. Higher frequencies of intake of fish, fruits and vegetables could be an indicator of higher food intake in general and the observed associations might be due to general good nourishment. However, one may assume that most Norwegian children are well nourished. Can dietary factors really mean this much already from the transition to solid foods and the first two years of life? In developing countries, there is consistent evidence that the adequacy of diet, particularly while the brain is rapidly growing, has lasting implications for neurodevelopment (246). In industrialised countries as Norway, where most children have access to an adequate diet, variations in diet are assumed to be less influential. However, the results from our study indicate that relatively small differences in a child's early diet may have the potential to influence neurodevelopment with measurable effects already at the age of one year.

5.2.3 The kindergarten intervention and its effects on vegetable intake and food neophobia score

Given the premise that an early introduction of a variety of foods, and in particular vegetables, can influence both development of food preferences as well as a child's current and later development and health, how can we make sure that our children get the right impact? To find out more about how to early influence children's acceptance of new foods and increase vegetable liking and intake, the

intervention *Barns matmot 2.0* was developed and implemented. As described in the methods chapter, the intervention was two-armed with children in intervention group 1 being served warm lunches with an emphasis on certain vegetables, while children in intervention group 2 also attended weekly sensory lessons in addition to the lunch serving. When planning this study, one of the hypotheses was that the effect of the intervention would be more pronounced in the more intensive intervention group 2 (diet + sapere). Our results showed that the intake of the three intervention vegetables was higher in group 2 (diet + sapere), supporting the assumption of a more pronounced effect of the more intensive intervention (diet + sapere). However, the parents knowing about the intervention vegetables in the lunch menu during the intervention period may have resulted in a higher awareness of these vegetables when completing the questionnaire post intervention, resulting in higher numbers of intake. Also, to be considered is the limitations with the FFQ and its focus on measuring vegetables. This has already been discussed in the section about the dietary assessment.

The unadjusted analysis of total vegetable intake as a continuous variable showed a positive effect of the intervention in group 1 (diet) and adjusting for baseline vegetable intake and parental education only slightly attenuated this estimate. How to report this finding is not just a statistical decision because the evidence was only there in a very weak way for the diet only group and not in the diet + sapere group. However, the effect sizes and confidence intervals for the diet + sapere group overlapped with the diet group for this outcome, making it difficult to conclude that the intervention effect in the two intervention groups differed. Why would adding the Sapere sensory education remove the effect of the diet intervention? To underestimate a weak suggestion of effect of the intervention would be just as problematic as to overestimate the effects. We therefore found it important not only to look at the p-values, but also consider the effect sizes of the analysis in the interpretation of our findings. We can only speculate whether the p-values would have been different if the number of participants had been higher.

One of the hypotheses for this study was that to intervene early before the onset of food neophobia could reduce the degree of neophobia following the intervention. Exposing a child to a variety of foods at a young age could be effective in promoting liking and intake of both exposed and other new foods (193). If the child is familiar with a variety of vegetables and other foods before the food neophobia starts to peak, this could potentially limit the development of neophobia. In our study, we were not able to detect any effect of the intervention on the level of food neophobia. The food neophobia had not yet started to peak in this present study sample which may have made it difficult to detect a difference in the development of food neophobia during the relatively short intervention period. Helland et al. found a mean score on the CFNS of 18.2 (SD 9,3) in a sample of Norwegian toddlers at mean age of 28 months (94). The mean CFNS score in this present sample of 14.3 (7.1) at mean age 16.7 months supports the perception that food neophobia is increasing from the age around two (54, 247). There is a possibility that a lower degree of food neophobia in the intervention groups could have been detected if the intervention period lasted longer and the measurement of food neophobia was done when the child was older than 2 years and past the age where the probable peak of food neophobia is reached. To be considered is also whether the CFNS scale is the best measure to measure young children's food neophobia, as discussed in the section 5.1.3

A considerable strength of the study was that the intervention was conducted in a natural setting, making it conceivable that the intervention can be implemented in kindergartens throughout the country with the internet-based administration approach. In the section 5.1.1, discussing the study design, I argued that kindergartens seem to be a useful arena to influence children's food preferences and promote healthy diets. When children show signs of neophobic behaviour this is a natural phase in their development and parents and other caregivers should persist in offering a variety of foods. For children to achieve the tastings necessary to acquire acceptance of vegetables, serving vegetables repeatedly in the kindergarten may be necessary to increase the exposure to vegetables and

other healthy foods. In line with the Social-Ecological Model, nutrition education activities at the institutional level are important because changes at those levels can enable and reinforce changes at the individual level (248). Hence, influencing kindergartens to serve healthy foods in line with the dietary guidelines and to implement educational activities such as sensory education can have repercussions for whole families and help children to obtain lifelong healthy dietary habits. However, there are some barriers to consider when trying to implement this and similar interventions in kindergartens. According to the qualitative analyses of the precursor of this study, some of the challenges for the kindergarten when implementing new lunch menus were the lack of cooking skills among the staff, time pressure involved in the making of novel dishes and lack of personnel resources to do the cooking (135). This is in line with the national survey among kindergarten staff which found that personnel resources and time available, as well as the knowledge and skills among the staff regarding food and nutrition were of great importance for the food serving in kindergartens (144). Results from another kindergarten-based study in Norway, the BRA-study, found that the economic environment in a kindergarten was positively associated with the vegetables served and eaten there (249). Having a larger food budget or perceiving to have budgetary freedom contributed to kindergartens buying and serving more vegetables. The kindergarten in our project got a small subsidy meant to cover some of the extra expenses to buy the foods necessary for the lunch menus. This was, by far, not enough to cover all the food expenses. Some of the kindergartens also gave feedback that of the food preparation, such as cutting all vegetables necessary for a vegetable stew, was more time consuming than they had foreseen (personal communication). Thus, it seems important to support the kindergartens with enough knowledge about nutrition and cooking skills, as well as enough of both personal and economic resources to be able to successfully implement similar interventions in a large scale.

5.3 Ethical considerations

Research involving human subjects should be conducted in accordance with relevant ethical guidelines. Ethics committees or institutional review boards ensures that studies involving human research participants are designed to conform with relevant ethical standards, and that the rights and welfare of participants are protected. As outlined in chapter 3.4 The Ethics of participation, the study *Barns matmot 2.0* was conducted in accordance with the Helsinki Declaration, the protocol was notified the Norwegian Centre for Research Data, and prospectively registered in the ISRCTN registry. Informed consent was obtained from the kindergarten manager and from one of the parents of all participating children when registering for the study, and all participants had the opportunity to withdraw from the study whenever they wanted.

For some, information on food intake can be perceived as sensitive information, but more likely, other kinds of information on the child and the parent, like anthropometric measures, parents' relationship status and parents' education or job situation, can be perceived as sensitive. The parents were informed that all given information would be processed anonymously, and that it would not be possible to identify either the parent or the child in the published results of the study. Another consideration is the participant burden of answering questionnaires. Some questionnaires, like the one we used in our study, may be time-consuming and demanding to complete. However, to be able to gain results in human research, some participant burden is almost unavoidable.

It was voluntary for the participants to taste and eat the food that they were presented to during the intervention, and the kindergarten staff were instructed not to force the children to taste if they did not want to. The staff was also asked to consider any food allergies, and all the recipes had alternatives to potential allergens where applicable. Overall, we considered the intervention study to have little or no potential risks or discomfort for the participating children.

5.4 Future perspectives

The discussion about whether prolonged exclusive breastfeeding can reduce new food acceptance is a long and challenging discussion. As mentioned in section 5.2.1, our findings on breastfeeding and neophobia may inform the debate on optimal timing of complementary feeding. It would be both interesting and necessary to perform more research with larger samples on a possible association between breastfeeding duration and mode and level of food neophobia as similar findings may have implications for the advice on exclusive breastfeeding duration.

It would also be of great interest to find out more about how even small differences in diet may have measurable effects on neurodevelopment in children in industrialised countries where one can assume that most children are well nourished. Future research should aim to explore further which dietary compounds or dietary patterns have the greatest potential to beneficially influence early neurodevelopment.

Since most Norwegian children normally eat three meals per day in kindergarten, kindergartens have a great potential to shape children's food preferences and should take great care to secure that the meals they serve are varied and healthy. However, food and diet are not core parts of kindergarten staff skills. There is a need to enhance kindergarten staff's skills and knowledge about cooking and how to influence children's food preferences. By incorporating multi-component interventions into routine practices in the kindergarten, healthy food preferences can be promoted. Even though multi-component interventions have the potential to be effective targeting children's food preferences and food variety (137, 160, 250), more research is needed to understand the best strategies to increase vegetable acceptance and vegetable intake in children. According to the review of methods for increasing vegetable consumption in early childhood by Holly and Haycraft (2017), future research in this area should focus on the bitter vegetables commonly rejected and to present longitudinal evidence of the

efficacy of previously demonstrated methods (104). Long-term effects of such interventions are seldom reported. Matwiejczyk's umbrella-review on characteristics of effective interventions promoting healthy eating for preschoolers in childcare settings, noted that the duration of interventions should last more than one year, and ideally 2-4 years (137). Unfortunately, long-lasting interventions are outside the scope of a PhD-project. However, the intervention material developed for this study is ready to be used in more widespread and long-lasting interventions. Since all the material used in the intervention was web-based it has the potential to be easily implemented on a large scale in Norwegian kindergartens. Future interventions in kindergarten may well have a web-based approach to exploit the potential of reaching many in an easy and cost-effective manner. However, to be able to scale up similar interventions it seems necessary to provide the kindergartens with some economic and even human resources in the form of a cook or a kitchen assistant.

Experiences from the precursor study was that conducting the sensory lessons were less challenging than the cooking, and kindergarten staff agreed that the sensory education lessons were fun and full of learning opportunities for both staff and toddlers (135). This is in line with unpublished qualitative data from the present study (190). Since the sensory lessons are less resource-demanding for the kindergartens they could be relatively easy to implement as part of the pedagogical arrangements in the kindergartens. However, we do not know whether the sensory lessons alone, without the lunch service, would influence food neophobia and vegetable intake. An aim for future research could therefore be to explore the longitudinal effects of solely implementing sensory lessons in kindergartens, starting already at the age of one year. Such research could provide answers as to whether this method should be implemented in kindergartens to a greater extent than is the case today.

6 Conclusion

In the study *Barns matmot 2.0* the exploration of associations between breastfeeding mode and duration and food neophobia showed that exclusive breastfeeding for more than 5 months and any breastfeeding for 12 months or more were associated with higher levels of food neophobia in one-year-old children. These results indicate that it might be relevant to introduce complementary foods between 4 and 6 months of age to reduce later food neophobia in children, but more research is needed to confirm these findings. We also found that both longer duration of breastfeeding and more frequent intakes of fish, fruits and vegetables were associated with higher neurodevelopmental scores in one-year-old children. This reinforces the notion that a child's food intake and food variety has a great potential already from early infancy.

Early exposure to a wide range of foods is important for food acceptance in children, and hence the attainment of healthier dietary habits that can influence children's development early in life, as well as later health and well-being. The kindergarten setting is an arena with great opportunities to influence young children's food intake. The intervention study *Barns matmot 2.0* showed some promising results regarding an increased intake of the intervention vegetables but due to a larger loss to follow-up than expected, our data lacked precision and other effect results were inconclusive. A web-based program such as the one invented for this study, can help kindergarten staff improve their skills and knowledge in cooking and how to learn children about food and taste. To our knowledge, *Barns matmot 2.0* is the first study to address food neophobia and vegetable intake in one-year-old children in kindergarten with a web-based approach. This present web-based intervention has the potential to be easily accessible, scalable, and cost-effective, but that relies on kindergartens being willing to implement it. Focusing on varied menus, sensory education, repeated exposure and role modelling in kindergartens, this intervention could potentially have a public health impact, including social impact on both 1-year-olds, family and staff if implemented as a part of the kindergarten's daily routines.

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Paper 1

A cluster randomized web-based intervention trial to reduce food neophobia and promote healthy diets among one-year-old children in kindergarten: study protocol

BMC Pediatrics

STUDY PROTOCOL

Open Access

A cluster randomized web-based intervention trial to reduce food neophobia and promote healthy diets among one-year-old children in kindergarten: study protocol

Eli Anne Myrvoll Blomkvist[*] , Sissel Heidi Helland, Elisabet Rudjord Hillesund and Nina Cecilie Øverby

Abstract

Background: A child's first years of life are crucial for cognitive development and future health. Studies show that a varied diet with a high intake of vegetables is positive for both weight and cognitive development. The present low intake of vegetables in children's diets is therefore a concern. Food neophobia can be a barrier for vegetable intake in children. Our hypothesis is that interventions that can increase children's intake of vegetables should be introduced early in life to overcome children's neophobia. This study aims to develop, measure and compare the effect of two different interventions among one-year-old children in kindergartens to reduce food neophobia and promote healthy diets.

Methods: The kindergartens are randomized to one of three groups: two different intervention groups and one control group. We aimed to include a total of 210 children in the study. The first intervention group will be served a warm lunch meal with a variety of vegetables, 3 days a week during the intervention period of 3 months. The second intervention group will be served the same meals and, in addition, kindergarten staff will be asked to implement pedagogical tools including sensory lessons, adapted from the Sapere method, and advices on meal practice and feeding practices. The control group continues their usual meal practices. Parents and kindergarten staff will complete questionnaires regarding food neophobia, food habits and cognitive development at baseline and post intervention. A similar intervention among 2-year-old children in kindergarten has been implemented and evaluated earlier. We will investigate whether a digital version of this intervention has an effect, because digital interventions can be easily implemented nationwide. We will also investigate whether there are benefits of conducting such interventions in younger children, before the onset of food neophobia. Questionnaires, information videos and recipes will be digitally distributed.

Discussion: Results of this study will provide new knowledge about whether a sensory education and a healthy meal intervention targeting children, kindergarten staff and parents will reduce levels of food neophobia in children, improve parental and kindergarten feeding practices, improve children's dietary variety, improve children's cognitive development and reduce childhood overweight.

Trial registration: ISRCTN98064772.

Keywords: Children, Kindergarten, Food neophobia, Diet variety, Parental feeding practices, Cognitive development, Overweight, Sapere method, Sensory education

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Background

What we eat has significant impact on health and disease [1]. In Norway, eating an unhealthy diet is the second most important risk factor for disease burden [2]. A low intake of fruits and vegetables and a high intake of energy dense foods increases the risk for non-communicable diseases [1, 3, 4]. To reduce this risk The World Health Organization (WHO) recommends an increased intake of fruit and vegetables throughout the world [5]. The increasing prevalence of obesity among children is a global health challenge [6, 7]. Although an inverse relationship between fruit and vegetable intake and obesity in children remains somewhat unclear [8], a healthy dietary pattern with a high intake of fruit and vegetables is crucial for health and development. Studies have also shown that diet has an impact on children's cognitive development [9], and that healthy dietary patterns in childhood can influence cognitive and neuropsychological outcomes [10, 11]. The World Health Organization (WHO) has stated that proper nutrition during the 1000 days between a woman's pregnancy and her child's 2nd birthday (the 1000 day window) has a profound impact on a child's ability to grow, learn and thrive, and hence a lasting effect on a country's health and prosperity [12].

In Norway the average intake of fruits and vegetables in one-year old children is only half of the recommended intake [13]. A low intake of vegetables is particularly challenging regarding health. A national survey found that one-year old children ate only 32 g of vegetables per day on average [13] . One barrier for vegetable intake in children is food neophobia, meaning a reluctance to taste and eat new foods. This trait is most explicit in children between 2 and 6 years of age [14]. Food neophobia is associated with a low intake of vegetables and a poorer dietary quality [15, 16]. Helland et al. [17] found that food neophobia was negatively associated with intake of fruit and vegetables, berries and fish in two-year olds. Moding and Stifter [18] suggest that rejection of new foods during infancy predicts neophobia during early childhood. Fletcher et al. [19] found that an early liking for fruit and vegetables predicted increased later intake, so they hypothesize that increasing early exposure to fruit and vegetables may have long-term beneficial consequences.

Food neophobia and scepticism to eat new foods is modifiable. Several intervention studies have shown that repeated exposure, where pre-school children are exposed to either vegetables alone or to vegetables combined with other flavours, for instance a dip or sauce, can increase children's willingness to taste and eat vegetables [20–24]. Researchers have also found that hiding vegetables in mixed courses can be an effective strategy to increase children's vegetable intake [25]. Role modeling is a well-known strategy that can influence food intake in children [26–29]. Social Cognitive Theory suggests that modelling by teachers or by peers, would be one of the most effective methods to encourage food acceptance in preschool children [30]. Hendy et al. [26] found that enthusiastic teacher modelling was more effective than silent teacher modelling, and that peer modelling was the most effective method to encourage new food acceptance in preschool children.

Another area of research is sensory education, allowing children to explore foods with their senses by smelling, touching, hearing, watching and tasting. The aim of sensory training is to increase the willingness to taste new foods and thereby increase intake of vegetables or other foods in children [31–34]. The Sapere method based on Puisais' work *Le Goût de L'enfant* [35] can be one way of learning about food through senses and language in kindergartens and schools. The sensory-based food education programme, which originated in France, has since been translated to Swedish [36] and is being used both in schools and kindergartens in Sweden [37] To our knowledge, the Sapere method has not been subject to research in preschoolers in Norway except from the study done by our research group [38]. Helland et al. [17, 38] have tested the Sapere sensory education in toddlers between the ages of two and 3 years. We will now investigate whether there are benefits of conducting such interventions in younger children, before the usual onset of food neophobia.

Toddlers in Norway spend much of their time in kindergarten and more than 80% of all children between 1 and 2 years of age attend kindergarten [39]. The recent (2017) Framework plan for kindergartens [40] suggests that kindergarten staff use mealtimes and cooking to enable the children to enjoy food, participate, communicate and feel togetherness. Food and feeding practices in kindergarten can influence children's diet and eating habits [41], and kindergarten staff have a great responsibility and opportunity when it comes to teaching children about food and meals. The kindergarten setting is an arena where both repeated exposure to new foods and sensory education can be implemented systematically, as well as an arena where the importance of caregivers as role models can be explored.

The Internet plays an important role in our everyday lives. A recent review found that caregivers use the internet for both information, support and education [42]. An earlier study in seven European countries found that 71% of Internet users had used the Internet for health purposes [43]. It is reasonable to believe that the proportion is even higher today. A recent study showed that providing kindergarten and elementary school educators with web-based resource materials improved their attitudes, increased their knowledge and lead to positive behavioural intentions concerning educating their students about oral

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health [44]. We believe that this can be applied to other health concerns as well.

The aim of the present study is to develop and evaluate the effect of two different interventions among one-year-old children in kindergartens in four counties in Norway. The interventions aims to promote a healthy and varied diet in young children that can facilitate cognitive development and help to prevent future overweight.

Outcomes

Primary outcomes:

1. Child vegetable intake assessed at baseline, after the intervention, and at the ages of 36 and 48 months.
2. Children's level of food neophobia assessed at baseline, after the intervention, and at the ages of 36 and 48 months.
3. Child dietary habits and food variety assessed at baseline, after the intervention, and at the ages of 36 and 48 months.

Secondary outcomes:

4. Child cognitive development assessed at baseline, after the intervention, and at the ages of 36 and 48 months.
5. Self-reported weight and height assessed at baseline, and at the ages of 36 and 48 months.
6. Parental and kindergarten staff feeding practices assessed at baseline, after the intervention, and at the ages of 36 and 48 months.

Methods
Study design

This study is a cluster randomized controlled trial. It is an ongoing study.

The kindergartens are randomized to one of three groups: two different intervention groups and one control group. We aimed to include 210 children in the study.

A similar intervention among 2-year-old children in kindergarten has been implemented and evaluated earlier [38] and we will now investigate the effect of a digital version of such an intervention, because a digital intervention can be more easily implemented into kindergarten daily life. Information videos and recipes for the project will be included in a password protected study web page and questionnaires will be distributed by e-mail.

The protocol for the present study was approved by the Norwegian Centre for Research Data (ref.nr 49951). Informed consent was obtained from the kindergarten manager and from one of the parents of all participating children when registering for the study.

Recruitment and participants

The kindergartens were recruited from four counties in Norway; Telemark, Oppland, Sør-Trøndelag and Møre og Romsdal. An invitation to participate was first sent by e-mail to the managers of kindergartens in the two counties Telemark and Oppland and due to low participation, two new counties were included: Sør-Trøndelag and Møre og Romsdal. The invitations were sent to kindergartens registered at The Norwegian Directorate for Education and Training (UDIR) ($n = 1080$). Kindergartens registered as "open" kindergartens where children and their parents attend together ($n = 18$), kindergartens registered with less than 4 children ($n = 7$) and kindergartens with children from 3 to 5 years only ($n = 12$) were not invited to participate (Fig. 1). The invitation included detailed information about the study and a link to the study registration web page. A reminder e-mail was sent to the kindergartens 2 weeks after the first e-mail. Because few kindergartens ($n = 32$) registered for the study initially, a random selection of kindergartens in all four counties was additionally contacted by phone ($n = 321$). A total of 48 kindergartens registered for the study (Fig. 1). Two of the kindergartens withdrew before randomization because they had fewer than three children born in 2016 (Fig. 1).

The pedagogical leaders in the participating kindergarten departments were asked to distribute an electronic invitation letter to the parents providing information about the study and a link to the registration web page where parents could register their child to participate in the study. Inclusion criteria for the children participating in the study was that they had to be born in the year of 2016 and that at least one of the parents could read and understand Norwegian. A total of 267 children were registered for the study (Fig. 1).

Intervention

The participating kindergartens ($n = 46$) were randomized into two different intervention groups and one control group. Children in the first intervention group will be served a warm lunch meal with a variety of vegetables, 3 days a week during the intervention period that will last for 3 months. After 3 weeks with the first menu there will be a one-week break before starting the serving of meals from the second menu 3 days a week in three more weeks and after another one-week break, 3 weeks with the third and last menu. The kindergartens will have access to a total of nine different recipes in a password protected web page especially designed for each intervention group. (Table 1) Each of the three menues has one "focus" vegetable, i.e. spinach, celeriac and fennel. A minimum of two meals per week will include the focus vegetable so that the children are exposed to each

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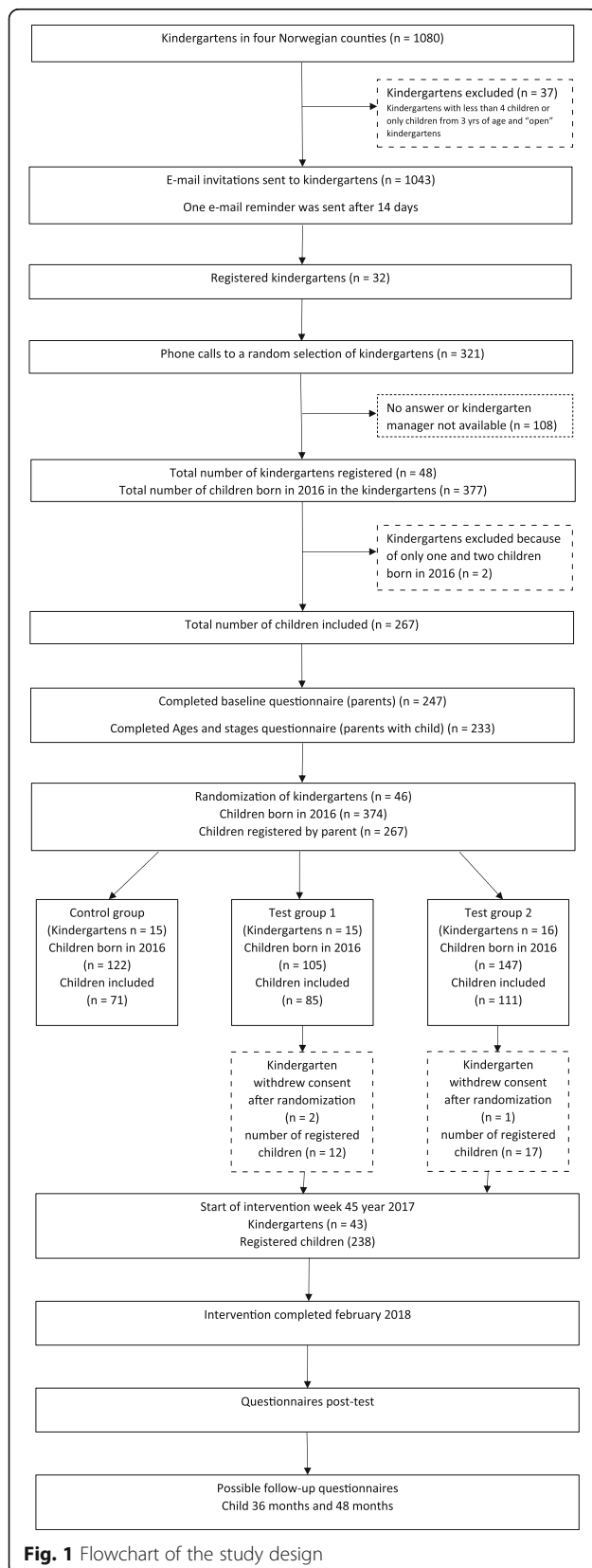
Fig. 1 Flowchart of the study design

Table 1 Lunch dishes cooked in the intervention kindergartens

	Vegetarian	Fish	Vegetarian
Menu 1 spinach	Pasta with vegetables and feta cheese (includes spinach)	Pan fried fish with carrot purée	Spinach and lentils soup
Menu 2 celeriac	Celeriac soup	Salmon with celeriac purée	Vegetable stew (includes celeriac)
Menu 3 fennel	Minestrone soup (includes fennel)	Fish cakes with oven baked vegetables (includes fennel)	Potato and broccoli omelet

vegetable at least six times during the menu period of 3 weeks (Table 1).

Children in the second intervention group will be served the same meals from the same menus as described for intervention group 1. In addition the kindergarten staff in intervention group 2 will be asked to implement pedagogical tools including i) weekly sensory lessons (Sapere method) [35] for the participating children and ii) advice on meal practice and feeding practices during mealtime. Children participating in the sensory lessons will have three more exposures, a total of at least nine exposures, of the selected "focus" vegetables.

Meal practice and Feeding practices recommendations are presented in short information videos on the study web page which is only available for the second intervention group. The videos contain information about food neophobia, repeated exposure, role modeling, our five senses, basic tastes, and the Sapere method.

The control group will continue their usual meal practices.

Measurement instruments

To evaluate the effect of the interventions on the given outcomes, parents and kindergarten staff will complete questionnaires at baseline and post intervention. There will be follow-up-questionnaires when the children are 36 and 48 months old.

A main questionnaire to the parents including all the outcome variables has been developed specifically for this study, except measures of cognitive development which is measured with the Ages and Stages Questionnaire (ASQ) [45]. A separate questionnaire was developed for the pedagogical leaders in the participating departments. All measurements are described in detail below.

Measures of child food neophobia

Child food neophobia is measured with a 6-item version of Pliner's 10-item Child Food Neophobia Scale (CFNS) [46]. The Child Food Neophobia scale (CFNS) is a validated tool which uses parental reporting of child neophobia. The 6-item version of CFNS is commonly used to measure food neophobia in young children and has been used with children as young as 2 years [15, 17, 47, 48]. Responses are ranged from "strongly disagree" to

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"strongly agree" on a seven-point scale. The CFNS items have been translated from English into Norwegian, and back-translated into English by members of our research group earlier [17]. The CFNS was included in the parental questionnaire.

Measures of parental and kindergarten staff feeding practices

Parental and kindergarten staff feeding practices is measured with the Comprehensive Feeding Practices Questionnaire (CFPQ), which has been validated earlier [49]. CFPQ has been used to assess parental feeding practices at 18 months [50], and has already been translated to Norwegian and validated in parents of 10-to-12-year-olds [51].

The original CFPQ includes 12 subscales. The following eight subscales are included in the parental questionnaire when the child is 1 year old: Child control, Emotion regulation, Encourage balance and variety, Environment, Food as reward, Modeling, Pressure and Restriction for health. The four other subscales: Involvement, Monitoring, Restriction for weight control and Teaching about nutrition will be included in the parental questionnaire to be used when the children have reached the age of three and 4 years.

Kindergarten staff will complete a modified version of the CFPQ, adapted to a kindergarten context. The following seven subscales were included in the questionnaire to the pedagogical leaders: Child control, Emotion regulation, Encourage balance and variety, Food as reward, Modeling, Pressure and Restriction for health.

Measures of children's food intake, food variety and vegetable liking

Child food intake and food variety is measured by selected items from a food frequency questionnaire that has been validated and used in large national surveys [13]. Amounts of food is not measured, only frequencies of intake. Questions on how often the child eats fruits, berries, vegetables and potatoes are included, in addition to questions about bread and cereals, drinks, warm meals and snacks. The response options for intake of fruits and vegetables are: never, < 1/month, 1–3/month, 1–2/week, 3–4/week, 5–6/week, 1/day, 2/day, > 3/day. In addition to these food frequency questions, questions about duration of breastfeeding and time of introduction to solids are also included.

Measure of vegetable liking is adapted from a questionnaire used in the Australian study Nourish [52]. The answers are graded as 1: likes a lot, 2: likes a little, 3: neither likes or dislikes, 4: dislikes a little, 5: dislikes a lot, 6: never tried.

Measures of food refusal and food fussiness

Questions about child food refusal and food fussiness were adapted from The Nourish study questionnaires

for children at the age of 14 months and 2 years [52]. Questions were translated into Norwegian by the author and back-translated by two co-authors to ensure that the meaning of the questions remained the same as in the original questionnaire.

Measures of weight and height

Measures of weight and height are self-reported. Parents are asked to report child weight and height in the most recently health control from the children's health card.

Measures of other variables

Food frequency questions about parental intake of fruits, berries and vegetables, as well as questions about parental age, height and weight, ethnicity, length of education and occupation are also included in the questionnaire.

Level of food neophobia in parents and kindergarten staff is measured with the original 10-item version of the FNS [53].

Questions about the kindergartens meal routines and food serving are included in the questionnaire to the pedagogical leaders.

Measures of cognitive development

Children's cognitive development is measured with the Ages and Stages Questionnaire [45]. This questionnaire has been widely used in both clinical and research settings in several countries [54, 55]. It consists of 19 different questionnaires covering the age-range of 4 to 60 months. The questionnaires cover five different domains: communication, gross motor, fine motor, problem solving and personal social skills. The Norwegian version of ASQ has also been validated [56].

Compliance with intervention elements

The pedagogical leaders in the two intervention groups will complete a weekly short evaluation form on the study web page. They are asked to assess the success of the implementation of the intervention elements on a scale of zero to ten and to describe whether there are discrepancies from the project plan as described in the study web page.

Sample size calculation

Sample size was calculated according to the primary outcome food neophobia. A previous cross-sectional trial of 505 toddlers in Southern Norway [17] resulted in a mean neophobian score of 18.2 (SD:9.3). We assumed that a mean score reduction in the level of food neophobia from 18.2 to 12.0 would be of public health value. Using a power of 80% and type 1 error of 5%, this suggested 36 participants were needed in each group. To adjust for within cluster variation we assume an intra-cluster correlation coefficient of 0,1 and a design

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effect factor of 1,6 expecting 7 participants in each cluster [57]. Based on these calculations we would need 58 participants in each group. Due to a probable loss of participants of 20%, we aimed to recruit 70 children in each of the three groups, a total of 210 children in this study.

Randomization
The 46 registered kindergartens were randomized from a block of 48 into three groups.

Data analysis
Data will be analyzed when the data collection is completed during springtime 2018.

Our primary goals are to detect differences in food neophobia scores, vegetable intake and food variety between each of the intervention groups and the control group.

Discussion
Children today spend a large amount of time in Kindergarten. Kindergartens are a potentially important setting for influencing children's food choice at an early age and there has been a call for intervention studies in this field [58]. With this study we are investigating the effectiveness of a web-based multi-component intervention in kindergarten. We have developed a web-based intervention that may easily be implemented in kindergartens throughout the country. The intervention kit includes three elements: a pedagogical tool (the Sapere method), a menu of associated lunch dishes and information videos targeting kindergarten staff and parents.

The strengths of our study are that it is being conducted in a natural setting, making it possible to reproduce in other kindergartens if it shows an effect. The Sapere method is widely used in some countries; however, few studies have evaluated its effect on children's diet and health [35]. Further, distributing all study information electronically increases the availability of the intervention, making it easy for kindergarten staff and parents to find and use the recipes and tools. It may also be easier to track the children's parents for follow-up-studies since the questionnaires are distributed by e-mail. To our knowledge there are few, if any, intervention studies on child food neophobia that has targeted children before the onset of neophobia, normally around the age of 2 years. In addition to investigating methods to reduce child food neophobia and increase child dietary variety, we also investigate if a dietary intervention in kindergarten can improve children's cognitive development.

However, our study also has limitations. Recruitment of kindergartens and parents turned out to be quite difficult. It was also quite challenging to distribute the ASQ because there are different questionnaires for different ages (in months), and the registered children varied in age between 10 months and 20 months. The results of the study are based on parent-reporting which may have its weaknesses.

Conclusion
Results of this study will provide new knowledge about whether a sensory education and a healthy meal intervention targeting children, kindergarten staff and parents will reduce levels of food neophobia in young children, improve parental and kindergarten feeding practices, improve children's dietary variety, improve children's cognitive development and reduce childhood overweight. This study will also provide knowledge about whether an electronically distributed intervention could be easily implemented in kindergartens nationwide.

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Paper 2

Associations between breastfeeding mode and duration and food neophobia in toddlerhood: A cross-sectional study among Norwegian toddlers

ORIGINAL ARTICLE

Associations between breastfeeding mode and duration and food neophobia in toddlerhood: A cross-sectional study among Norwegian toddlers

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Popular scientific summary

- We evaluated the association between breastfeeding duration and food neophobia in young Norwegian children. Food neophobia may be a barrier to healthy eating among toddlers and should be reduced.
- We found that compared to shorter breastfeeding duration, still being breastfed at 12 months and being exclusively breastfed at 5 months were associated with slightly higher scores of food neophobia at 16 months of age.
- Our findings may inform the debate on optimal timing of complementary feeding, but should, given the cross-sectional nature of this study, be interpreted with caution.

Abstract

Background: Research on the association between breastfeeding duration and food neophobia is inconclusive. Breastfeeding and measures to reduce food neophobia are highly recommended to ensure a healthy diet early in life.

Objective: The aim of this study was to evaluate the association between breastfeeding duration and food neophobia in young Norwegian children.

Design: Participants (n = 246) were recruited through kindergartens in four Norwegian counties in 2017. The parents of 1-year-olds filled in questionnaires, including standardized questions on breastfeeding and food neophobia. Cross-sectional results are presented. Comparisons of child neophobia score at 16 months of age according to breastfeeding status at various timepoints during infancy were explored in linear regression models adjusted for maternal education and parental food neophobia.

Results: Still being breastfed at 12 months and being exclusively breastfed at 5 months were independently associated with slightly higher food neophobia score at the mean age of 16 months compared to shorter duration of breastfeeding. We found no other associations between breastfeeding duration and child food neophobia.

Discussion: Our study adds to the somewhat scarce literature regarding associations between breastfeeding mode and duration and later food neophobia; some literature shows protective relations between breastfeeding and food fussiness, and others report opposite or null findings.

Conclusion: We found that both being breastfed at 12 months and being exclusively breastfed at 5 months were independently associated with slightly higher food neophobia score at the mean age of 16 months compared to shorter duration of breastfeeding. As the data are derived from a cross-sectional study, these findings should be interpreted with caution.

Keywords: *breastfeeding; food neophobia; toddlers; introduction of solid food; food fussiness*

Early diet influences a child's lifelong health and prosperity (1). A diet high in vegetables, fruits, whole grains, and fish yields better health outcomes (2). Food neophobia, meaning reluctance to try new food, is related to a restricted diet with a limited intake of fruits and vegetables at all ages (3, 4). Food neophobia peaks at about 2–6 years of age (5), the age when food preferences develop, and lifelong dietary habits are initiated (6).

Food neophobia has a genetic component; however, it can be reduced by parental feeding practices, such as repeated exposure to new and unfamiliar foods and modeling of healthy eating (5). It is important to understand which factors are related to food neophobia early in life in order to improve long-term diet and public health.

In Norway, exclusive breastfeeding is recommended for the first 4–6 months, and continued breastfeeding is recommended for the first 12 months of life (7). Whether breastfeeding per se reduces or increases food neophobia has been discussed (7). The rationale for breastfeeding to reduce food neophobia is that children who are breastfed experience a variety of flavors according to their mother's diet, giving them a wider exposure to different flavors (8) than those who receive infant formula (9), thereby potentially increasing the child's willingness to try new foods. The rationale for why breastfeeding should increase food neophobia is the potential delay in exposure to more varied flavors and textures due to breastmilk being a larger component of diet (10). In a review, Cole et al. (10) found no cross-sectional associations between those who are ever breastfed and those who are picky eaters (defined widely and including food neophobia). Regarding breastfeeding duration and the association with food neophobia, the results are mixed. One longitudinal study found a negative association between breastfeeding duration and food fussiness (11), while Cassells et al. reported, from cross-sectional data in a randomized controlled trial, no correlation between breastfeeding duration and food neophobia, although this was not the aim of their study (12). One longitudinal study found that introducing complementary food at an earlier age was positively associated with fussy eating (11). No study has specifically addressed the associations between breastfeeding duration and food neophobia (10).

In Norway, there has been an extensive debate about whether children should be exclusively breastfed for 4 or 6 months (13, 14). The World Health Organization (WHO) recommendation is for 6 months (15). Being exclusively breastfed according to the WHO definition and recommendation entails no introduction to solids until 6 months of age. One of the main issues that has been discussed is whether prolonged exclusive breastfeeding would reduce later food variety and increase food neophobia (7). There is still little evidence on this relation. We therefore aimed to evaluate whether the duration of exclusive breastfeeding for 4 or 6 months and the duration of any breastfeeding are related to food neophobia in 1-year-old children.

Methods

Study design

The presented results are from the baseline study Barns Matmot 2.0, a web-based cluster randomized controlled trial in kindergartens to reduce food neophobia and promote healthy diets. The study protocol has been described elsewhere (16). The Norwegian Centre for Research Data approved the protocol (Ref. No. 49951).

Participants

The recruitment of kindergartens started in May 2017 from all public and private kindergartens in four counties in Norway (Telemark, Oppland, Sør-Trøndelag, and Møre og Romsdal) that met the inclusion criteria ($n = 1,043$) of having children of the appropriate age (i.e. born in 2016). The following kindergartens were not included: those registered as "open" kindergartens where children and their parents attend together ($n = 18$), those registered with less than four children ($n = 7$), and those with children from 3 to 5 years old only ($n = 12$). The invitations were sent to the kindergarten managers by email and included detailed information about the study and a link to the study registration webpage. The kindergarten managers received one reminder email after a couple of weeks. Because few kindergartens ($n = 32$) registered for the intervention study initially, a random selection of kindergarten managers ($n = 321$) was additionally contacted by telephone and asked whether they had received and read the email. In total, 48 kindergartens registered for the study. Recruitment ended in October 2017.

Before randomization, the pedagogical leaders in the participating kindergarten departments were asked to distribute an electronic invitation letter to the parents of children born in 2016, providing information about the study and a link to the registration webpage where parents could register their child for the study (www.uia.no/barnsmatmot2). Inclusion criteria for the children were that they had to be born in the year of 2016 and that at least one of the parents could read and understand Norwegian. Parents could register their child for the study from late August 2017 until the end of October, 2 weeks before the intervention started in the kindergartens in November 2017. In total, 267 children were registered by their parents for the study. An overview of the recruitment is given in the flow chart (Fig. 1).

The baseline questionnaires were sent to parents by email shortly after registration and had to be completed electronically before randomization and the start of the intervention. Of the 267 registered children, baseline data were only filled in for 246 children. Baseline data from these 246 form the basis for this study. During the recruitment period, two kindergartens were excluded (Fig. 1), and later, three intervention kindergartens withdrew from the intervention, leaving 43 kindergartens for the randomized controlled study. However, for the present cross-sectional analyses, we included data from the 46 kindergartens (Fig. 1) since parents had already agreed to participate and filled in questionnaires before their kindergarten withdrew from the intervention.
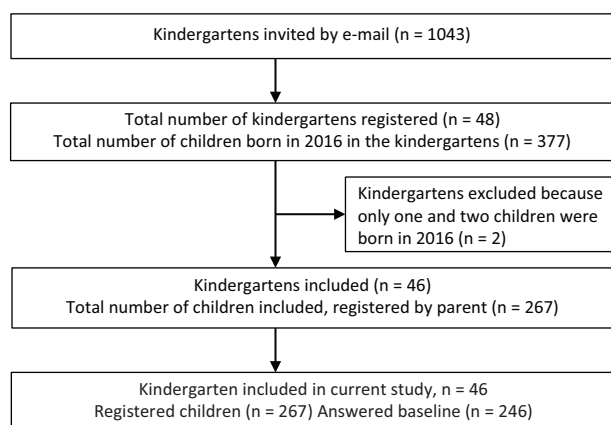
Fig. 1. Flowchart of recruitment of kindergartens and children.

Instruments

The parents filled in a questionnaire developed for this study that includes characteristics such as age, sex of the child and parent, and education of the father and mother. Furthermore, there were food frequency questions regarding the diets of both the child and parents.

Parents reported at what age the child had been introduced to different foods (porridge, canned dinners, fruits, fruit purees, bread, yoghurt, milk, formula, juice, and water) with response categories of "not had," 0–2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 or more months, and "do not know."

Any breastfeeding was measured with the following question: "How old was your child when he or she stopped being breastfed?" The responses included never breastfed, 1 week, 2 weeks, 3–4 weeks, 2 months, 3 months, etc., up to 12 months, and then older than 12 months and still being breastfed. The responses were recoded in months, presented by 6 months or less, 7, 8, 9, 10, or 11 months, and 12 months or longer. Exclusive breastfeeding was calculated by first defining whether the child was breastfed in the given month, and then whether the child had been introduced to any food or drink other than breastmilk in the given month. To be categorized as exclusively breastfed, the child had to only receive breastmilk without being introduced to other food or drink.

Child food neophobia was measured with a six-item version of Pliner's ten-item Child Food Neophobia Scale (CFNS) (17). The CFNS is a validated tool that uses parental reporting of child neophobia. The six-item version of CFNS is commonly used to measure food neophobia in young children and has been used with children as young as 2 years (17). In the present sample, the six items showed very good internal consistency, the Cronbach's alpha of 0.88. The six items were as follows:1) "My child is constantly sampling new and different foods" (reversely scored), 2) "My child does not trust new foods," 3) "If my child doesn't know what a new food is, he or she

won't try it," 4) "My child is afraid to eat new things he or she has never had before," 5) "My child is very particular about the things he or she eats," and 6) "My child will eat almost anything" (reversely scored). Responses ranged from "strongly disagree" to "strongly agree" on a 7-point scale. A CFNS score was computed with higher scores indicating higher levels of food neophobia. The total score ranged from 6 to 42. The CFNS items have been translated from English to Norwegian and then translated back to English (3). The CFNS was included in the parental questionnaire. Furthermore, parental food neophobia was assessed by the original 10-item Pliner score with different wording (e.g. I am constantly sampling new and different foods) with a score range from 10 to 70.

Highest completed education of both parents was asked for, with five response alternatives: less than 9 or 10 years of primary school, primary school, secondary school or high school, university/college 4 years or less, or university/college more than 4 years. This was recoded into high or low education, with having any university education defined as high education and no university education defined as low education.

Statistics

Descriptive statistics with means, standard deviations (SD), and percentages were used to analyze the demographics of both the child and parent populations. Comparisons of food neophobia scoring between children being breastfed or exclusively breastfed and not breastfed at different ages were analyzed using two sample *t*-tests. Due to some skewness in the outcome variable food neophobia, we also performed non-parametric tests, independent samples Mann–Whitney *U*-test, showing the same results. We therefore only present the *t*-tests. Crude and adjusted linear regressions were performed regarding associations between breastfeeding duration (both any and exclusive breastfeeding) and food neophobia scoring. The breastfeeding variable was included as a dichotomous variable with a cut-off at the given month (6 to 12 months for any breastfeeding and 3 to 6 months for exclusive breastfeeding). Adjustments were done for maternal education and parental food neophobia scoring, according to the literature (3, 5). An additional analysis was conducted with any breastfeeding as a continuous variable (weeks of any breastfeeding). Such an analysis was not possible for exclusive breastfeeding as this variable lack details regarding 0–2 months of exclusive breastfeeding (introduction of solids was asked for from 0 to 2 months, then 3, 4, 5, etc. leaving the first category of exclusive breastfeeding less detailed than from 3 to 6 months). We also performed additional analysis of the association between food neophobia and breastfeeding with breastfeeding (any and exclusive) categories (presented in text). Because completion of the reported variables was mandatory in

the current web-based questionnaire, there were no missing values. All analyses were performed using SPSS 25.0, and the significance level was set at $P \leq 0.05$. The study size was calculated according to the primary outcome of the original randomized control trial (see protocol paper), and for this study, the baseline data are used.

Results

The mean age of the children was 16.3 months (Table 1), ranging from 10 to 24 months. Forty-eight percent were girls, and all children participating were born in Norway. The mean parental age was 30.9 years, and 89% of those filling in the questionnaire were mothers. More than 90% of the parents were living together at the time of inclusion. The majority of the mothers had higher education, while more than 40% of fathers had higher education. Most parents were born in Norway.

The mean child food neophobia score was 14.3 (SD 7.1), whereas the parental score was 23.6. Most of the children were still breastfed at 6 months (71%), while only 10% were exclusively breastfed until 6 months of age.

There was no significant difference in CFNS score at 16 months between those who were breastfed and those who were not at the respective time no longer breastfed for a

Table 1. Baseline characteristics of participants included (mean [SD]) or *n* (%)

Characteristics	Values
Child characteristics	
Age (months), Mean (standard deviation [SD])	16.3 (3.1)
Gender female, N (%)	117 (48)
Ethnicity: Child born in Norway (%)	246 (100)
Breastfed ever	225 (92)
Breastfed at 4 months	201 (82)
Breastfed at 5 months	186 (76)
Breastfed at 6 months	174 (71)
Exclusively breastfed at 4 months	153 (62)
Exclusively breastfed at 5 months	60 (24)
Exclusively breastfed at 6 months	24 (10)
Child food neophobia at 16.3 months, mean (SD)	14.3 (7.1)
Parent characteristics	
Mean age in years (SD)	30.9 (5.4)
Gender female N (%)	218 (89)
Body mass index (kg/m²)	25.4 (4.4)
Parents living together (%)	232 (94)
Ethnicity: Mother born in Norway N (%)	225 (92)
Ethnicity: Father born in Norway N (%)	220 (89)
Mothers' education high N (%)*	157 (64)
Fathers' education high N (%)*	104 (42)
Parental food neophobia mean (SD)	23.6 (10.2)

All participants: *n* = 246.
*Higher education is defined as having any university/college education.

shorter duration in the crude analysis. When adjusting for maternal education and parental food neophobia, which are both known to be related to child food neophobia (3, 5), those who were breastfed for 12 months or longer had significantly higher food neophobia score than those who were breastfed for a shorter period (Table 2). Food neophobia scoring was also significantly higher among those exclusively breastfed for 5 months or more compared to those exclusively breastfed for a shorter period in both crude and adjusted analyses (Table 3). In detail, this means that those who were breastfed for 12 months or longer and those who were exclusively breastfed for 5 months or longer were more prone to have a slightly higher level of food neophobia at 16 months of age compared to those who were breastfed for a shorter duration, with a score of about 1.5 to 2 points higher than those who were breastfed for a shorter duration.

We also performed one analysis using any breastfeeding as a continuous variable, that is, weeks being breastfed in relation to CFNS scoring at 16 months. Crude results yielded B: 0.035 (95% confidence interval [CI]: −0.14, 0.084), p: 0.162, and adjusted results yielded B: 0.044 (95% CI: −0.006, 0.094), $P = 0.087$. Due to skewness because of three identified outliers, we performed sensitivity analysis without the three outliers (food neophobia scale: 38–42), with essentially the same results for exclusive breastfeeding, however not for any breastfeeding at 12 months where the *p*-value was above 0.05 (data not shown).

To further explore the relation between breastfeeding and food neophobia, we performed linear regression analysis using any breastfeeding (0, 1–3, 4–5, 6–8, 9–11, 12 months, and more than 12 months) and exclusive breastfeeding duration (exclusively breastfed 2 or less months, for 3, 4, 5, and 6 months or more) as categorical variables. There was no significant association between food neophobia and any breastfeeding Crude: $B = 0.324$ (95% CI: −0.127, 0.776), $P = 0.159$, and adjusted for parental food neophobia and maternal education Adjusted: $B = 0.417$ (95% CI: −0.049, 0.882), $P = 0.079$ in these analyses. There was no significant correlation between exclusive breastfeeding measured as a categorical variable of increasing duration: Crude: $B = 0.203$ (95% CI: −0.304, 0.710), $P = 0.431$, and adjusted for parental food neophobia and maternal education: $B = 0.224$ (95% CI: −0.285, 0.732), $P = 0.387$. In Table 4, we present the food neophobia score for those who stopped breastfeeding exclusively at 3, 4, 5, and 6 months and those who exclusively for less than 2 months. These numbers show that there is no linear relation between food neophobia and categories exclusive breastfeeding.

Discussion

There was no significant difference in CFNS score at 16 months of age according to breastfeeding status reported at monthly intervals between 6 and 11 months

Table 2. Differences in Child Food Neophobia Scale score at 16 months of age according to being breastfed (any breastfeeding) or not at different stages during the second half of infancy Crude and adjusted models

Age	Any breastfeeding	No breastfeeding	P^a	Crude		Adjusted	
				B	P^b	B	P^c
6 months	N = 174	N = 72					
Child food neophobia	14.7 (7.4)	13.3 (6.4)	0.153	1.43 (−0.54, 3.40)	0.153	1.77 (−0.23, 3.77)	0.082
7 months	N = 162	N = 84					
Child food neophobia	14.8 (7.3)	13.3 (6.7)	0.099	1.54 (−0.35, 3.42)	0.109	1.84 (−0.08, 3.77)	0.060
8 months	N = 151	N = 95					
Child food neophobia	14.8 (7.3)	13.4 (6.8)	0.108	1.48 (−0.36, 3.32)	0.115	1.78 (−0.11, 3.67)	0.065
9 months	N = 129	N = 117					
Child food neophobia	14.8 (7.4)	13.6 (6.8)	0.198	1.17 (−0.62, 2.97)	0.200	1.47 (−0.37, 3.30)	0.117
10 months	N = 112	N = 134					
Child food neophobia	15.0 (7.5)	13.6 (6.8)	0.118	1.43 (−0.36, 3.23)	0.118	1.56 (−0.26, 3.39)	0.092
11 months	N = 95	N = 151					
Child food neophobia	15.2 (7.7)	13.7 (6.7)	0.107	1.51 (−0.33, 3.35)	0.107	1.74 (−0.10, 3.60)	0.064
12 months	N = 87	N = 159					
Child food neophobia	15.3 (7.9)	13.7 (6.7)	0.093	1.60 (−0.27, 3.47)	0.115	1.90 (0.12, 3.79)	0.049

[a]Two independent sample *t*-tests.
[b]Linear regression.
[c]Linear regression adjusted for maternal education and parental food neophobia.

Table 3. Differences in Child Food Neophobia Scale score at 16 months of age according to exclusive breastfeeding or not at 3, 4, 5, and 6 months or more of age (Crude and adjusted models)

Age	Exclusively breastfed	Not exclusively breastfed	P^a	Crude		Adjusted	
				B (95% confidence interval [CI])	P^b	B (95% CI)	P^c
3 months or more	N = 184	N = 62					
Child food neophobia	14.2 (6.8)	14.4 (8.1)	0.233	−0.19 (−2.25, 1.89)	0.860	−0.09 (−2.16, 1.97)	0.926
4 months or more	N = 153	N = 93					
Child food neophobia	14.6 (6.9)	13.8 (7.5)	0.403	0.79 (−1.06, 2.64)	0.403	0.89 (−0.97, 2.76)	0.347
5 months or more	N = 60	N = 186					
Child food neophobia	15.9 (7.5)	13.7 (7.0)	0.046	2.11 (0.04, 4.20)	0.046	2.17 (0.11, 4.23)	0.039
6 months or more	N = 24	N = 222					
Child food neophobia	15.9 (7.8)	14.1 (7.1)	0.234	1.83 (−1.19, 4.85)	0.234	1.61 (−1.38, 4.60)	0.289

[a]Two independent sample *t*-tests.
[b]Linear regression.
[c]Linear regression adjusting for maternal education and parental food neophobia.

Table 4. Child food neophobia score measured at 16 months according to duration of exclusive breastfeeding

Exclusive breastfeeding	Food neophobia score (mean [SD])
Exclusively breastfed for less than 2 months (*n* = 62)	14.4 (8.1)
Exclusively breastfed for 3 months (*n* = 31)	12.5 (6.5)
Exclusively breastfed for 4 months (*n* = 93)	13.7 (6.3)
Exclusively breastfed for 5 months (*n* = 36)	15.8 (7.5)
Exclusively breastfed for 6 months (*n* = 24)	15.9 (7.7)

of age, although CFNS scoring was numerically higher among children being breastfed at all timepoints. Those who were still breastfed at 12 months had significantly higher mean CFNS score than those with shorter duration of being breastfed. The same pattern was true for the relationship between being exclusively breastfed and later CFNS score. There was no significant difference in CFNS score at 16 months according to being exclusively breastfed or not at 4 months of age, but those who were still exclusively breastfed at 5 months or later had significantly higher CFNS score than those who were not. Our

study adds to the literature regarding associations between breastfeeding mode and duration and the level of food neophobia with some indication that extended duration of both any breastfeeding for 12 months or more and exclusive breastfeeding for 5 months or more were weakly associated with higher scores of food neophobia at the mean age of 16 months. Previous literature is scarce regarding the specific outcome of food neophobia in relation to breastfeeding mode and duration (9, 12), with some literature showing negative associations between breastfeeding and food fussiness, and other literature showing the opposite or null findings (10, 18). Our study results are in favor of the latter.

Shim et al. found that children exclusively breastfed for 6 months were 75% less likely to be food neophobic in toddlerhood (at mean age of 3 years) compared to those who were not (9). Further, a Danish study found that children who had been exclusively breastfed until 5–6 months of age were less often categorized as picky eaters and had a higher vegetable intake than those only breastfed until 0–1 months of age (18). These results are not directly comparable to our findings due to the younger age of the children in this study and the majority of children being below the age at which food neophobia normally peaks.

A possible explanation for higher CFNS score with extended exclusive breastfeeding could be that the subgroup of children who are exclusively breastfed for 5 months or longer have been less exposed to a variety of foods at an early age, potentially leading to less willingness to try and accept new foods later. It is known from previous research that breastmilk varies in flavor depending on the maternal diet, thus exposing the infant to variation in taste even when fully breastfed (19). However, it could be that this variation is of less importance compared to exposure to food variety at this age and that a potential benefit of being breastfed on later food neophobia is negated by less sensory exposure to complementary foods.

Maier et al. (20) compared the acceptance of new foods between formula-fed and breastfed infants when given a variety of foods at different frequencies. They found that both being breastfed as opposed to being formula fed and given a variety of foods early during weaning rather than being given a certain food often resulted in better acceptance of new foods when measured some weeks after the intervention (20). This study illustrates the complicated relation between milk feeding mode, complementary feeding and food acceptance. Several predictors for food neophobia exist, and the lack of early exposure to a variety of foods is one of these predictors (5, 10).

The transmission of taste compounds from the mother's diet through breastmilk to the infant has been observed; however, the magnitude of such transmission could vary widely from mother to mother and can differ according to what food is eaten (21). The taste exposure through mother's milk is therefore likely to be variable (22). Research suggests that exposure to the actual foods has a more robust effect on acceptance than the taste transmitted through breastmilk (22). Harris and Coulthard (22) suggested that a combination of breastfeeding with the timely introduction of complementary foods has the best effect on the acceptance of new foods and should be the best strategy for developing infant acceptance of foods, such as fruit and vegetables.

A strength of our study is that it is performed in a country with high breastfeeding rates compared to other countries in which these associations have been previously examined. More than 70% of the children were breastfed at 6 months, and 10% were exclusively breastfed at 6 months.

It is worth noting that the overall level of food neophobia is low in this study, which is however in line with Cassell et al.'s (12) study of 2-year-olds in Australia. The distribution of the food neophobia score was somewhat skewed toward lower score, indicating that most children were not neophobic as yet at the time when neophobia was assessed. The peak of food neophobia is around 2 years of age; therefore, the observed level is expected. However, one should note that the food neophobia scale was originally developed for 5–8-year-old children, and even though it has been used in 2-year-olds, it has not previously been used in younger children. The scale was developed 25 years ago, and since the connotations of 'novel' food has changed for most people in the Western world (23), new methods should probably be applied in future studies. Despite limitations with the scale, the internal consistency was good, and we found a small difference in food neophobia at 16 months according to breastfeeding duration. The observed numerical differences in CFNS according to breastfeeding status at different time points varied between 1.5 and 2 points. Whether a difference of this magnitude has any predictive value regarding later food neophobia, or fussiness, is difficult to say. Helland et al. (3) have shown a linear relationship between neophobia and healthy food items, which could mean that any positive change in neophobia scoring could improve diet. In addition, in a public health perspective even small differences may be of relevance when the exposure is common. In addition, one could speculate that the association would be stronger if food neophobia had been assessed later, for example, around or after the age of two when food neophobia normally peaks. Future studies should therefore include longer follow-up.

Given the cross-sectional nature of the data, we cannot exclude the possibility of reverse causation, that is, that higher child food neophobia or fussiness may have led to longer duration of breastfeeding in our sample. If this were the case, breastfeeding mode and duration might not have any causal relationship with food neophobia, either positive or negative.

Residual or unmeasured confounding of the observed association by factors associated with both breastfeeding duration and food neophobia, such as parenting style, feeding practices, and hereditary factors, cannot be excluded. A further limitation of our study is the potentially low generalizability because of low participation rate. Due to the nature of the study, we lack information about those who did not register for participation. We also lack information about those who registered and did not fill in the baseline questionnaire ($n = 21$). Compared to national numbers, our participants had slightly higher education than Norwegian parents in general (24). Given that breastfeeding and breastfeeding duration are related to maternal education, this may have affected our results (25). Those participating might breastfeed longer and be more aware of dietary guidelines than the general public. If so, one could expect that a clearer relation would be found with a greater diversity in breastfeeding duration and child diet. On the other hand, the age of parents was comparable with the mean age of mothers of 1-year-olds in Norway. Further, the geographic diversity and the diversity in the size and type of kindergartens from which the children were recruited may enhance the generalizability of our findings. The data were self-reported, and breastfeeding was assessed in retrospect when the child had reached 16 months of age. For the latter, the maternal memory of the duration of breastfeeding seems to be quite high (26).

Conclusion

Still being breastfed at 12 months of age was associated with a slightly higher CFNS score at 16 months compared to shorter breastfeeding duration. Similarly, being exclusively breastfed at 5 months or longer was associated with slightly higher CFNS score at 16 months of age compared to shorter exclusive breastfeeding. No other associations between breastfeeding duration and food neophobia were found. As data were derived from a cross-sectional study, our findings should be interpreted with caution.

Acknowledgments

Conflict of interest and funding

Authors' contributions

EAM, ERH, and NCØ developed the design and content of this study. EAM performed the recruitment and data collection. NCØ performed the analysis, and NCØ and EAM wrote the first draft of this article; all authors critically commented on the article. All authors read and approved the final version of this article.

Ethical consideration

The Norwegian Social Science Data Services, Data Protection Official for Research was notified of the protocol of this study on 13/09/2016 (Reference No. 49951). Informed consent was obtained from the parents of all participating children and from all participating kindergartens and kindergarten staff. The procedures followed in this article were in accordance with the Declaration of Helsinki (1975), as revised in 2008.

Consent for publication

Not applicable.

Availability of data and material

We are working on several papers on the same data material and do not wish to share our material before we have thoroughly analyzed data.

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Diet and Neurodevelopmental Score in a sample of one-year-old children – A cross-sectional study

Article

Diet and Neurodevelopmental Score in a Sample of One-Year-Old Children—A Cross-Sectional Study

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Abstract: Environmental factors in the first years of life are crucial for a child's neurodevelopment. Research on the association between breastfeeding and neurodevelopment is inconclusive, while research on the possible association between other dietary factors and neurodevelopment is inadequate in children as young as one year of age. The aim of the present study was to investigate associations between both breastfeeding and other dietary factors and the neurodevelopment of one-year-old children in Norway. Methods: Participants were recruited from kindergartens in four Norwegian counties in 2017. A questionnaire including questions about dietary factors and breastfeeding, and a standardised age-related questionnaire on neurodevelopment (the Ages and Stages Questionnaire), were completed by parents of one-year-olds. Linear regressions adjusting for relevant covariates were conducted to explore the associations. Results: In our sample of 212 one-year-old children, a longer duration of breastfeeding was associated with higher neurodevelopmental scores. Dietary intake of fish, fruits and vegetables was also strongly associated with higher neurodevelopmental scores, even after adjustment for breastfeeding and maternal education. Conclusion: Our results indicate that healthy dietary factors are important for neurodevelopment in young children, with measurable effects already at the age of one year.

Keywords: neurodevelopment; ages and stages questionnaire (ASQ); children; diet; fruits and vegetables; vegetable intake; fish intake; dietary factors; breastfeeding

1. Introduction

The first years of life are crucial to a child's neurodevelopment. Neurodevelopment concerns the acquisition of skills in a variety of developmental domains, including fine and gross motor function, language and social adaptation skills and cognition. Early neurodevelopment tracks into later in life and is important for later IQ and academic achievement [1–4]. Genetic, biological and environmental factors such as sex, gestational age, maternal mental health, maternal education and parental socio-economic status are all factors that can influence neurodevelopment [1,5,6].

Nutrition also influences neurodevelopment and adequate diet quality is therefore of utmost importance in the early years in which brain development is at its peak. Infants' nutrient requirements are high in order to meet the demands of their growth and development.

The World Health Organization (WHO) recommends exclusive breastfeeding for at least 6 months, while the European Society of Paediatric Gastroenterology, Hepatology and Nutrition Committee on Nutrition (ESPGHAN), as well as the Norwegian Health Directorate, recommends the introduction of complementary foods between 4–6 months of age [7–9].

Longer duration of breastfeeding has been associated with better cognitive and motor development in preschool children [10–14]. Although several studies have demonstrated an association between breastfeeding and cognitive functioning, results from observational studies are diverse, especially after adjusting for possible confounders such as socioeconomic status and maternal IQ [15–17].

Observational studies suggest that several micronutrients, including omega-3 fatty acids, zinc, iron and iodine play important roles in children's brain development [18]. Since nutrients do not act alone, and individuals consume combinations of food, Nyaradi et al., suggest that public health interventions should focus on the promotion of overall diet quality rather than isolated micronutrients [18].

Healthy dietary patterns in childhood can influence later cognitive and neuropsychological outcomes [19,20]. A recent review found a positive association between healthier foods (wholegrains, fish, fruits and/or vegetables) and executive functioning in children and adolescents, whereas less healthy snack foods, sugar-sweetened beverages and red/processed meats were inversely associated with executive functioning [21]. Smithers et al. found that healthier dietary patterns from 6 to 24 months may have a small but persistent effect on IQ at 8 years [19]. Nyaradi et al. found that a high-quality diet in the early years had a positive effect on academic achievement at ages 10 and 12 [3]. However, to our knowledge, no studies have so far investigated the association between diet and child neurodevelopment measured by standardised screening tools in one-year-olds. With this present study, we aimed to investigate whether breastfeeding and the intake of selected foods and food groups in infancy are associated with higher neurodevelopmental scores as early as at the age of one year.

2. Materials and Methods

2.1. Study Design and Participants

Data for the present study were derived from the baseline study of a web-based cluster randomised controlled trial among one-year-old children in kindergartens in Norway. The study protocol for this trial has been published elsewhere [22]. The protocol was prospectively registered in the International Standard Randomised Controlled Trial Number registry (reg.nr. ISRCTN98064772) and approved by the Norwegian Centre for Research Data (ref.nr. 49951).

The recruitment of kindergartens started in May 2017 and targeted all public and private kindergartens in four Norwegian counties (Telemark, Oppland, Sør-Trøndelag and Møre og Romsdal) that met the inclusion criterion (*n* = 1043): having children born in 2016. Before randomisation, the pedagogical leaders in participating kindergarten departments were asked to distribute an electronic invitation letter to the parents of children born in 2016 that provided detailed information about the study and a link to the registration web page where parents could register their child to the study. Parents were informed that they consented to participate by registering their child. Inclusion criteria for child enrolment were that they had to be born in the year of 2016 and that at least one of the parents had to be able to read and understand Norwegian. Parents could register their child for the study from late August 2017 until the end of October, two weeks before the intervention started in the kindergartens in November 2017. In total, 267 children were registered for the study. The baseline questionnaires were sent to parents by e-mail shortly after registration and had to be completed electronically before randomisation.

2.2. Measures

Primary and secondary outcomes of the randomised controlled trial, as well as all measures and instruments, are presented in the study protocol [22]. Parents completed a comprehensive questionnaire including all the outcome variables, except measures of neurodevelopment which were measured with the Ages and Stages Questionnaire (ASQ) [23]. Both questionnaires were administered as online surveys via links sent to the parents' e-mail addresses shortly after registering their child for the study. Measures relevant to the outcomes in the present paper are described below.

2.2.1. Measures of Child Neurodevelopment

Children's neurodevelopment was measured with the Ages and Stages Questionnaire [23]. ASQ is a developmental assessment tool kit for parents who complete the questionnaire at prescribed intervals, covering the age-range of 4 to 60 months. Each questionnaire consists of 30 described and illustrated questions divided into five different domains: communication/language, gross motor, fine motor, problem-solving and personal-social skills. The scoring is "yes" (10 points), "sometimes" (five points) and "not yet" (0 points), depending on the question whether the child has a certain skill or behaviour. While completing the questionnaire, the child has to be together with the parent to try out certain tasks or activities (e.g., Does your child stack a small block or toy on top of another one? and After you have shown your child how, does he/she try to get a small toy that is slightly out of reach by using a spoon, stick, or similar tool?). The maximum score is 60 points per domain, i.e., a total of 300 points maximum. The ASQ has been shown to be cost-effective, easy to use, appreciated by parents and has been widely used in both clinical and research settings in several countries [24–26]. The Norwegian version of ASQ has been validated and compared with US normative data [5,27]. The ASQ was made electronic by transferring questions and their corresponding illustrations to a web-based survey. When administering the electronic version of these questionnaires, we had no access to information on whether the child was born to term or not. The ASQ was therefore administered according to date of birth, and hence chronological age in months. The ASQ includes the question of whether the child was born to term, and if not born to term, how many weeks prior to term. As children born more than 3 weeks before term should have completed an age-adjusted questionnaire, children born before 37 completed pregnancy weeks (n = 12) were excluded from the analysis.

2.2.2. Dietary Intake

Child food intake was measured by selected items from a food frequency questionnaire (FFQ) that has been validated and used in large national surveys of the food habits of children ages one- and two-years-old in Norway [28,29]. The frequency of intake was assessed without specification of the amounts consumed. Questions on how often the child eats a broad selection of vegetables (for example "carrots", or vegetable categories, such as "onions and leek") and fruits (for example "bananas", or fruit categories, like "oranges, clementines and such") were included, in addition to questions about berries, potatoes, pasta and rice, bread and cereals, spreads, drinks, warm meals, sweets and snacks. All frequencies of intake were re-coded into times per week. The response options for intake of fruits and vegetables and how they were re-coded into times per week were as follows: never = 0, <1/month = 0.1, 1–3/month = 0.5, 1–2/week = 1.5, 3–4/week = 3.5, 5–6/week = 5.5, 1/day = 7, 2/day = 14, >3/day = 21.

Breastfeeding was assessed with a question of whether the child was still breastfed, and if he or she was still breastfed, how many times per day and night. The duration of breastfeeding was assessed with a question of the child's age when he or she stopped receiving breast milk, measured in weeks from birth to 4 weeks, and in months from 2 to 12 months and further. The duration of breastfeeding was re-coded into weeks.

2.2.3. Other Baseline Measures

Parents were asked to provide their child's date of birth, gender, whether the child was born in Norway, and weight and length at 12 months of age as recorded in the child's health card or weight and length from the most recent health control if the child was under the age of 12 months. Children's gender and date of birth were also checked against the registered data on the registration web page.

2.2.4. Measures of Parents' Socio-Demographics

Parents' marital status was assessed, entailing six response options: single, married, cohabiting, separated, divorced or other. The study asked for the highest completed education of both parents

with five response alternatives: less than 9 or 10 years of primary school, primary school, secondary school or high school, university 4 years or less or university more than 4 years. The work situation of the one parent who answered the questionnaire was assessed with the following response alternatives: work full-time, work part-time, "housewife", sick leave, leave, disabled, occupational rehabilitation, student, unemployed or other work situation. In addition, parents entered their own age in years, and the parent completing the questionnaire entered his or her gender. The non-Norwegian descent of both parents was approximated by the question of whether they were born in Norway. Parents also reported their own weight in kilograms and height in centimetres.

2.3. Statistical Analysis

Data analysis was performed using SPSS Statistics, version 25.0. Baseline characteristics expressed as mean and standard deviations (SD) and median and proportions as appropriate, were explored using descriptive statistics.

For the analyses, we combined the intake of some food groups to represent new variables:

1. Fresh fruits, vegetables, fresh potatoes, legumes and unsalted nuts into All fruits and vegetables.

2. Lean fish, fatty fish, fish products (processed fish), fish spread and roe spread into Fish and fish products.

3. Unprocessed red meat, unprocessed white meat (poultry), minced meat, sausages, liver paste (spread made of pork liver), ham and cold cuts into All meat and meat products.

4. Wholegrain bread, wholegrain crispbread, oatmeal porridge, oatmeal and müsli into Wholegrain products.

5. Sweets and candy, salted snacks, ice cream, biscuits (both sweet and salty), sugary drinks, sweet pastries and chocolate spread into Typical sugary foods.

Associations between ASQ-scores and dietary factors were explored using crude and multivariable linear regression. Both ASQ-scores and the included dietary factors were inspected for deviations from normality. Since the mean ASQ total score has been shown to differ slightly between age groups, we first tested the associations adjusting only for child age, but this did not change the estimates. Based on the literature regarding potential influences on ASQ score, we entered the child's age, gender and parents' education as covariates in a multiple regression model. Marital status and ethnicity were not considered relevant because most of the parents were cohabitant and Norwegian-born. In addition, we fitted a model where breastfeeding was included as a covariate together with the above-mentioned covariates. We also performed a robustness test by doing the regression analysis excluding those who had never been breastfed (*n* = 15) to check whether the associations remained the same.

3. Results

3.1. Study Sample

Table 1 presents the baseline characteristics of the study population. Out of the 267 children registered for the study, 246 parents answered the main questionnaire on demographics, dietary behaviour and other outcomes. Among the children included, all were born in Norway; 47.6% were girls, and the children's mean age was 16.7 (3.0) months. Among the parents who completed the questionnaire, 88.6% were women. The parents mean age was 31.2 years (SD 4.7), and 90.5% were born in Norway. Most parents were living together (94.3%), and 63.8% of the mothers and 42.3% of the fathers had higher education (University or College).

Table 1. Baseline characteristics of the study population.

Variable	Value
Children registered for the study (N)	267
Answered main questionnaire on demographics, diet etc. N (%)	246 (92.1)
Mean age in months (SD)	16.7 (3.0)
Gender Female N (%)	117 (47.6)
Parents	
Mean age in years (SD)	31.2 (4.7)
Gender * Female N (%)	218 (88.6)
Parents living together (%)	94.3
Ethnicity mother born in Norway N (%)	225 (91.5)
Ethnicity father born in Norway N (%)	220 (89.4)
Mothers education N (%)	
Primary school	10 (4.1)
Upper secondary school/High school	79 (32.1)
University/College <4 years	103 (41.9)
University/College >4 years	54 (22.0)
Fathers education N (%)	
Primary school	7 (2.8)
Upper secondary school/High school	135 (54.9)
University/College <4 years	62 (25.2)
University/College >4 years	42 (17.1)
Duration of breastfeeding in weeks (SD)	33.3 (18.4)
Median (min-max)	36.0 (0–55)
IQR ** (25th to 75th percentile)	20–52

* Gender of the parent who answered the baseline questionnaire; ** Interquartile range.

3.2. ASQ

The ASQ was completed by 232 parents. The number of age-appropriate ASQ forms distributed, number of completed questionnaires in each age group, ASQ scores in mean (SD) and median (min-max) are presented in Table 2. The mean ASQ total score across all age-in-months groups was 235.3 (SD 37.4).

Table 2. Number of children assessed with each age-specific Ages and Stages Questionnaire version, number excluded due to preterm birth and mean/median total ASQ scores.

Age of ASQ Assessment	Number of Participants	Number Completed ASQ (%)	Number Born >3 Weeks Pre-Term (Excluded)	Total ScoreMean (SD)	Median (Min–Max)
ASQ	267	232 (86.9)	12	235.3 (37.4)	240 (125–300)
10 months	7	7 (100)	1	230 (47.4)	238 (150–280)
12 months	34	26 (76.5)	1	232 (38.6)	240 (160–290)
14 months	41	37 (90.2)	2	238 (39.5)	245 (135–300)
16 months	62	56 (90.3)	3	229 (37.3)	230 (140–295)
18 months	58	50 (86.2)	3	231 (35.7)	235 (140–290)
20 months	48	41 (85.4)	2	248 (28.8)	245 (160–300)
22 months	17	15 (88.2)	0	239 (48.2)	240 (125–295)

3.3. Dietary Intake

The children's frequency of intake of relevant foods and food groups are presented as times per week in Table 3. The mean intake of vegetables was 20.3 times per week (SD 11.3); fresh fruits 17.0 times per week (SD 10.7) and that of all fruits and vegetables was 40.5 times per week (SD 19.9). The mean intake on lean and fatty fish was 2.1 times per week (SD 1.3) and that of total fish and fish products including fish as a spread was 5.9 times per week (SD 3.7). The mean intake of unprocessed meat was

2.2 times per week (SD 1.8), while that of all meat and meat products combined (including processed meats and spread) was 10.1 times per week (SD 4.4). The mean intake of wholegrain products was 11.7 times per week (SD 5.0) and that of typical sugary foods was 3.9 times per week (SD 3.7). The mean duration of breastfeeding was 33.3 weeks (SD 18.4), corresponding to approximately 8 months (Table 1).

Table 3. Children's dietary intake at baseline (*n* = 246).

Dietary Intake (Times per Week):	Mean (SD)	Median (IQR) *
Vegetables total (incl. veg as a spread)	20.3 (11.3)	18.7 (12.6–25.4)
Fresh fruits total (incl. berries, fruits as a spread)	17.0 (10.7)	15.0 (10.5–21.0)
All fruits and vegetables [1]	40.5 (19.9)	37.4 (26.2–50.2)
Fish (lean and fatty)	2.1 (1.3)	2.0 (1–3)
Fish and fish products (incl. fish as a spread)	5.9 (3.7)	5.5 (3.1–7.6)
Unprocessed meat (red meat and poultry)	2.2 (1.8)	2.0 (1.0–3.0)
All meat and meat products [2]	10.1 (4.4)	9.5 (7.1–12.5)
All meat and meat products minus liver paste	6.3 (3.6)	5.5 (4.0–7.5)
Liver paste (spread)	3.8 (2.2)	3.5 (3.5–5.5)
Wholegrain products [3]	11.7 (5.0)	11.3 (8.5–14.1)
Typical sugary foods [4]	3.9 (3.7)	2.7 (1.3–5.6)

* IQR: Interquartile range (25th–75th percentile); [1] Fresh fruits, berries, vegetables, fresh potatoes, legumes and unsalted nuts; [2] Unprocessed red and white meat, minced meat, sausages, includes meat as a spread (ham, cold cuts, liver paste); [3] Wholegrain bread and crispbread, oatmeal porridge, oatmeal and wholegrain müsli; [4] sweets, candy, snacks, ice cream, biscuits, sugary drinks and chocolate spread.

3.4. Associations Between Dietary Factors and ASQ Score

A total of 212 children, i.e., those born to term with completed questionnaires on both dietary factors and ASQ score, were included in the main analyses (Table 4).

The ASQ total score was significantly associated with the duration of breastfeeding (β 0.42, *p* = 0.004). The ASQ score increased with 0.4 points for every additional week of breastfeeding. The frequency of intake (times/week) of vegetables, fresh fruits and berries, fish and all fish products, respectively, was also positively associated with ASQ score (Table 4). Adjustment for potential confounders only resulted in minor attenuation of estimates and significance level. In an additional regression model, we adjusted for the duration of breastfeeding as a potential confounder of the associations between healthy dietary items and child development. The associations between the ASQ total score and the selected dietary factors attenuated slightly but remained significant after adjusting for breastfeeding. The strongest associations with the ASQ score in the fully adjusted model was observed for fish intake (β 3.90, *p* = 0.049) and intake of vegetables (β 0.88, *p* < 0.001). An increase of one serving of fish per week translated into a four-point higher ASQ score. An additional serving of vegetables per day translated into a six-point higher ASQ score (0.88/week × 7 days = 6.16).

Since there was a positive association between all meat products combined and ASQ, while no such association was found for unprocessed meat, we explored the "all meat" variable to see if there were differences between different meat types and meat products. We found that the intake of liver paste (mean 3.8 times per week, SD 2.2) was strongly associated with ASQ total score (β 2.29, *p* = 0.044), while other types of meat or meat products did not result in any association with ASQ score.

Wholegrain products were positively associated with ASQ in both the unadjusted and adjusted model, but when we included breastfeeding as a covariate in the third model, this association was no longer present. No association was observed between ASQ total score and combined intake of typically sugary foods in this sample of children (table 4).

As a robustness test, the adjusted regression analyses were repeated in a sample, (*n* = 197), where those who had never been breastfed were excluded (*n* = 15). All effect sizes remained practically the same, however, the significance level changed slightly for the associations regarding fruits and berries (*p* = 0.059), lean and fatty fish (*p* = 0.071) and liver paste (*p* = 0.056).

Table 4. Linear regression on associations between dietary factors and ASQ total score.

Dietary Factor	Unadjusted Model			Adjusted Model *			Adjusted Model Incl. Breastfeeding **		
	β	95% CI	*p*-Value	β	95% CI	*p*-Value	β	95% CI	*p*-Value
Duration of breastfeeding (weeks)	0.39	0.11–0.67	0.007	0.42	0.14–0.71	0.004	n.a ***	n.a ***	n.a ***
Fresh fruits and berries (times/week)	0.51	0.05–0.97	0.030	0.50	0.04–0.96	0.033	0.45	0.00–0.90	0.050
Vegetables (times/week)	0.94	0.50–1.37	<0.001	0.90	0.47–1.34	<0.001	0.88	0.45–1.31	<0.001
All fruits and vegetables (incl. potato, legumes) (times/week)	0.46	0.21–0.70	<0.001	0.44	0.20–0.69	<0.001	0.42	0.18–0.66	0.001
Fish (lean and fatty) (times/week)	4.21	0.24–8.19	0.038	4.28	0.36–8.21	0.033	3.90	0.02–7.76	0.049
All fish and fish products (incl. spread) (times/week)	1.79	0.47–3.11	0.008	1.85	0.54–3.15	0.006	1.70	0.41–2.99	0.010
Unprocessed red and white meat (times/week)	0.72	−2.02–3.45	0.605	1.17	−1.55–3.88	0.398	1.61	−1.07–4.29	0.237
All meat and meat products (times/week)	1.12	0.00–2.25	0.050	1.13	0.01–2.25	0.047	1.17	0.07–2.27	0.037
All meat and meat products minus liver paste (times/week)	0.86	−0.53–2.26	0.223	0.82	−0.58–2.22	0.247	0.94	−0.44–2.31	0.179
Liver paste (times/week)	2.30	0.02–4.58	0.049	2.44	0.18–4.70	0.034	2.29	0.07–4.51	0.044
Wholegrain products (times/week)	1.24	0.24–2.24	0.016	1.07	0.05–2.09	0.039	0.88	−0.13–1.89	0.088
Sugary foods (times/week)	1.23	−0.12–2.59	0.075	1.16	−0.26–2.58	0.109	1.15	−0.25–2.54	0.107

* Adjusted for child age, child gender, maternal and paternal education; ** Adjusted for child age, child gender, maternal and paternal education and duration of breastfeeding. *** Not applicable since the variable Duration of breastfeeding (weeks) is a covariate that is adjusted for in this model.

4. Discussion

In the present study, we aimed to examine potential associations between frequency of intake of selected foods and neurodevelopment as measured by ASQ total score in a sample of Norwegian one-year-olds. To our knowledge, there are few, if any, reports on whether and how dietary factors other than breastfeeding are associated with neurodevelopment in children this young. We found that the neurodevelopmental score was not only positively associated with duration of breastfeeding, but also positively associated with the frequency of the children's intake of fresh fruits, berries and vegetables, and with fish and fish products.

There are few studies comparable to the present study, both including other dietary factors than breastfeeding, and evaluating early diet and neurodevelopment in children as young as one to two years. We found that breastfeeding duration was associated with higher total neurodevelopmental scores. For this relation, previous results have been conflicting. Several studies have found similar associations, like the EDEN study of more than 1000 children [11]. They observed a positive association between longer breastfeeding duration and better cognitive and motor development, measured with the ASQ in 2- and 3-years-old children. Likewise, the Rhea study from Greece and the Mother's and Children's environmental Health (MOCEH) study from Korea showed similar results [10,13]. In these two studies, neurodevelopment was assessed by using the Bayley Scales of Infant and Toddler Development. There is, however, some controversy in this regard, with Holme et al., 2010 and Boutwell et al., 2012 showing no associations and arguing that sociodemographic factors and maternal IQ can explain the association between breastfeeding and neurodevelopment/cognitive development [17,30]. In our study, maternal education was adjusted for. One mechanism that could explain breastmilk's relation to neurodevelopment is that breastmilk provides the nutrients required for brain development, such as lipids, complex proteins and carbohydrates, as well as vitamins, minerals and other biologically active components [31,32]. In addition, it is suggested that the physical and socioemotional contact between mother and child during breastfeeding can influence neurodevelopment [33].

Beyond breastfeeding, we found that consumption of fish, vegetables and fruit and berries was associated with higher neurodevelopmental scores. This relation was still present after adjusting for the child's gender, age, parental education and duration of breastfeeding, indicating that these food items could be important contributors to neurodevelopment. Previous studies have explored relations between early diet and later development and academic achievement. Findings from the Raine cohort showed that diet at one year of age was associated with cognitive outcomes at 10 years of age [2]. Our findings demonstrate that associations between diet and child neurodevelopment can be measurable already in the first years of life.

There may be several mechanisms through which various aspects of a healthy diet are related to neurodevelopment. First, fatty acids in fish, as well as the content of iodine, are important for brain development [18,34,35]. Further, fruits and vegetables provide a broad range of micronutrients that are necessary for brain growth and development. For instance, carotenoids and vitamin C, found in abundance in fruits and vegetables, are presumed to play important roles in brain development and functioning [36–38].

Haapala et al. found that intake of red/processed meat was inversely associated with executive functioning in 7-years old children [39]. In our sample, we found a positive association between meat intake and ASQ score. However, when we removed the intake of liver paste from the variable on meat and meat products, this positive association was no longer present. Liver paste is a popular spread, especially among young children, and most kindergartens in Norway offer liver paste as a spread alternative. Liver paste has a relatively high iron content, which is important for development, and it is often used as an example of an iron-rich food recommended for children. Further research on this observed association between intake of liver paste and total ASQ score is needed to confirm our findings.

A significant strength of our study concerns generalisability. First, the participants were from 43 different kindergartens from four counties in different parts of Norway. Both large and small, private

and public kindergartens were represented from both urban and rural areas, so it is probable that the kindergartens included in our study are representative of Norwegian kindergartens.

Second, we distributed the full version of the ASQ as published, which included pictograms and instructions to attempt every activity with the child. Some earlier studies, using the ASQ as a measure of infant development, have simplified the questionnaire, for instance using it without pictograms, without prompts to try the activity with the child, or using shortened versions with only a few questions or selected domains [40–42]. Valla et al. concluded that it seems important to use the correct published version [42]. We also managed to distribute the age-related questionnaire (bimonthly specific) at the relevant age by calculating each child's age at the day of mailing the questionnaire to the parents.

Third, the study was performed in a country with high breastfeeding rates. Norway is among the countries with the highest breastfeeding rates in the world [43]. In our sample, more than 70 per cent of the children were breastfed (exclusively or partly) at 6 months of age (data not shown).

There are also limitations to our study. First, the sample of participating parents was rather homogeneous, the majority being highly educated mothers of Norwegian ethnicity, and this may have reduced the generalisability at the individual level. However, Norwegian women are relatively highly educated, with 58.2% of women in the age of 30 to 34 years being highly educated (university or college) [44]. Other aspects, such as the geographic diversity and the diversity in size and type of kindergartens, may enhance the generalisability.

Second, since the breastfeeding rate in this sample was high with only 15 children never being breastfed, it makes it difficult to draw conclusions regarding the associations between diet and neurodevelopment in those never breastfed. Our robustness test indicates that there might have been differences between those never and ever breastfed. However, our limited sample size suggests that such associations should be investigated further in a larger sample and in other populations.

Third, we did not have information about the mothers IQ, which is another important determinant of neurodevelopment in children. However, we did adjust for both parents' educational level, and although education is not the same as IQ, it is likely to represent some of the same potentials for confounding.

Fourth, we did not have the possibility to adjust for energy intake in the models. Higher frequencies of intake could be an indicator of higher food intake in general, for example, due to a healthy appetite, larger body mass and beneficial meal routines, and the observed associations might be due to general good nourishment.

Fifth, the results of the study are based on parents' self-report, which may have its weaknesses. Self-reported data entail a risk of social desirability bias, both as over- and under-reporting, as well as of recall bias. There are also limitations regarding the questionnaire used to assess food intake. The questionnaire does not measure absolute food intake, only frequencies of intake. It is possible that high-frequency users consume very small amounts each time, and the opposite that low-frequency users consume larger amounts each time is possible. In our study, the mean frequency of vegetable intake was quite high (approximately three times per day). This can probably be a correct measure of vegetable frequency during the day, but the amounts eaten of each vegetable do most likely not correspond to three full vegetable portions per day, which is the recommended intake of vegetables. Data shows that Norwegian children, in general, eat fewer vegetables than is recommended: the average intake in one-year-old children is only half of the recommended intake [45]. Nevertheless, FFQs are frequently used because they are simple, quick and reliable tools compared with other more time-consuming dietary assessment methods [46]. We considered the FFQ suitable for use in our study since we primarily wanted it to measure the vegetable variety and certain types of foods eaten, as well as to rank individuals according to food intake, rather than to measure the amount of food or calories in the children's diet.

5. Conclusions

In the present study, we found an association between neurodevelopmental score, measured with the Ages and Stages Questionnaire, and the duration of breastfeeding. As one of the first studies, we also found associations between dietary factors and neurodevelopment in children as young as one year old. We found strong associations between total ASQ score and the intake of fish, fruits and vegetables in one-year-old children. Our results indicate that a healthy diet is important for neurodevelopment in young children, with measurable effects already at the age of one year. To confirm our findings, we suggest further investigation in larger samples and different populations.

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Paper 4

Effectiveness of a kindergarten-based intervention to increase vegetable intake and reduce food neophobia among one-year-old children: a cluster-randomised trial

1   **Effectiveness of a kindergarten-based intervention to increase vegetable intake and**

2   **reduce food neophobia among one-year-old children: a cluster randomised controlled**

3   **trial**

4

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33   **Competing interests**

34 The authors declare that they have no competing interests.

35 **Authors' contribution**

36 EAMB and NCØ developed the study. EAMB, NCØ, ERH and SHH contributed to the

37 development of questionnaires and design, and EAMB conducted data collection. EAMB and

38 AKW conducted the analysis. EAMB drafted the manuscript with critical input from all

39 authors. All authors have read and approved the final manuscript.

40 **Trial registration:** ISRCTN98064772

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Popular scientific summary

- A low vegetable intake among children is of concern and the kindergarten is a promising setting to increase this intake.

- We have evaluated a web-based intervention in kindergarten aiming to improve child diet by increasing vegetable intake and reducing food neophobia using a randomised controlled design.

- Results indicate that such an intervention may improve intake of some vegetables, however we found no effect on food neophobia.

54 **Abstract:**

55 *Background:* Children's first years of life are crucial to their future health. Studies show that a

56 varied diet with a high intake of vegetables is positive in several domains of health. The

57 present low vegetable intake among children is therefore a concern. Food neophobia is a

58 common barrier to vegetable intake in children. As most Norwegian children attend

59 kindergarten from an early age, kindergartens could contribute to the prevention of food

60 neophobia and promotion of vegetable intake.

61 *Objective:* The aim of this study was to assess the effect of a cluster randomised trial among

62 one-year-old children in kindergarten to reduce food neophobia and promote healthy eating.

63 *Methods:* Forty-six kindergartens were randomly allocated to either a control group or one of

64 two intervention groups. Both intervention groups (diet and diet + Sapere-method) were

65 served a warm lunch meal including three alternating intervention vegetables while

66 intervention group 2 (diet + sapere) in addition received tools for weekly sensory lessons. The

67 intervention was digitally administered via information and recipes on a study website. The

68 control group did not receive any additional information. Parents completed digitally

69 distributed questionnaires addressing food neophobia and food habits at baseline and post-

70 intervention.

71 *Results:* The parents of 144 one-year-old children completed the questionnaires and were

72 included in the main analysis. The results suggested a higher intake of the intervention

73 vegetables in group 2 (diet + sapere) relative to the control group. The effect on total

74 vegetable intake was equivocal. No effect was observed on the level of food neophobia in

75 either intervention group.

76 *Conclusion:* Our study suggests that a digitally delivered, dietary- and

77 sensory intervention conducted in kindergartens can promote intake of intervention-targeted

78   vegetables. The effect on total vegetable intake was equivocal. We found no effect on the

79   level of food neophobia. Larger studies are needed.

80   **Keywords:** Children; Kindergarten; Food neophobia; Vegetables; Sensory education; Sapere;

81   Web-based, online resources.

82

Background:

What we eat has a significant impact on health and disease throughout the life course (1, 2). A low intake of fruits and vegetables increases the risk for non-communicable diseases and mortality (3-7). Despite what we know about the health benefits of diets rich in fruits and vegetables, the intake of these food groups is too low in many countries (8). The average intake of fruit and vegetables in one-year-old children in Norway is lower than the recommended intake, and the low intake of vegetables is particularly challenging (9, 10).

One barrier for vegetable intake in children can be food neophobia. Neophobia literally means "fear of the new", and food neophobia is defined as an unwillingness to eat unfamiliar foods (11). Food neophobia is considered a normal developmental stage that typically starts when the child is around two years old. It is most explicit in children between 2 and 6 years of age, and it gradually decreases with age into a relatively stable level in adulthood (12). Food neophobia is negatively associated with food variety and may lead to an inadequate nutrient intake (13-16). Perry et al. (13) and Bell et al. (17) highlight the need to expose children to a wide variety of nutritious foods before the age of two, the age when food neophobia tends to peak. To the best of our knowledge, this present study is the first intervention directed to reduce food neophobia in one-year-old children.

Repeated exposure, also known as mere exposure to foods, can increase a child's liking and intake of a food. A recent review (18) found that repeated exposure is a simple and successful technique for increasing preschool children's vegetable consumption. Studies find that as little as three to five exposures may be sufficient to increase food intake in young children (19-21).

Role modelling can also be efficient in influencing children's food choices (22). Social cognitive theory suggests that modelling by teachers and peers is one of the most effective methods to encourage food acceptance in preschool children (23). Holley et al. (24) suggests

108   that a combination of modelling, non-food rewards and repeated exposure is effective at

109   increasing children's consumption and liking of a previously disliked vegetable.

110   Sensory education could be a third way of influencing food acceptance. The aim of

111   sensory education is to awaken children's curiosity and interest in foods, increase the

112   willingness to taste new foods, and thereby potentially increase the intake of vegetables or

113   other target foods in children (25, 26). One such sensory training method is the Sapere

114   method, *sapere* meaning *to know, to feel, to taste*, based on Puisais' work *Le Goût de L'enfant*

115   (27). The Sapere method is used in both schools and kindergartens in other countries, among

116   them Finland and Sweden (28-30). To our knowledge, the Sapere method has not been subject

117   to research in kindergartens in Norway except from a trial done by our research group, in

118   which Helland et al. (16, 31, 32) tested the Sapere method in children aged 2-3 years.

119   In Norway, more than 90 per cent of all children between one and five years of age

120   attend kindergarten, an educational service for children aged 0-5 years (33). In 2019, 84.4 per

121   cent of children in the age group of one to two years attended kindergarten. Most children eat

122   three meals a day in kindergarten, a total of about 3000-4000 meals during his or her years in

123   kindergarten (34). Food preferences and dietary patterns in early childhood can be tracked

124   throughout childhood (35, 36). Young children tend to eat only what they like, but food

125   preferences are modifiable through experimental learning or individual experience (37-39).

126   Infants and toddlers are dependent upon parents and caregivers to feed them and are learning

127   how to eat through familiarization, observation and associative learning (40). The

128   kindergarten setting is thus an arena with great opportunities to influence the food intake of

129   young children.

130   Web-based intervention programmes designed to promote healthy eating can be both

131   appealing, cost-effective and capable of reaching large groups of children and caregivers (41).

132   There are various definitions of web-based interventions. For example, Koneska et al. defined

133   web-based or a web intervention as "downloadable or accessible via the internet through a

134   web browser," which can take the form of (but not limited to) a website, an email, or a web

135   message board (42). Providing online resources and interactive tools represents a promising

136   way of providing support to kindergartens and other types of childcare services (43).

137   The aim of the present study was to develop a web-based intervention with two graded

138   levels targeting one-year-old children in kindergartens in Norway and to evaluate the effect of

139   the interventions in a cluster randomised controlled trial setting. The interventions aim to

140   promote a healthy and varied diet in young children. In this paper, we report intervention

141   effects on food neophobia and vegetable intake post-intervention.

142

Methods:

Study design and participants:

This study was designed as a cluster randomised controlled trial. The trial was registered in the ISRCTN Registry in May 2017, Trial registration number: ISRCTN98064772. In line with Norwegian guidelines for such research, the protocol for the present study was evaluated and approved by the Norwegian Centre for Research Data, 13/09/2016, reference 49951. Informed consent was obtained from parents of all participating children and from all kindergarten managers and participating kindergarten staff. The study protocol has been published elsewhere (44).

The recruitment of kindergartens started in May 2017, from all public and private kindergartens in four counties (Telemark, Oppland, Sør-Trøndelag and Møre og Romsdal) of Norway that met the inclusion criterion (n = 1043): having children of the appropriate age (i.e., born in 2016). The four counties covered two different geographical areas of Norway and included kindergartens located in both rural and urban settings. Kindergartens registered as "open kindergartens" in which children and their parents attend together (n = 18), kindergartens registered with less than four children (n = 7) and kindergartens with children from three to five years only (n = 12) were not invited. The invitations were sent to the kindergarten managers by email and included detailed information about the study and a link to the study registration web page. The kindergarten managers got one reminder email after a couple of weeks. Because few kindergartens (n = 32) registered for the study initially, a random selection of kindergarten managers (n = 321) were additionally contacted by telephone and asked if they had received the email and further asked if they could be interested in participating in the study. The phone call recruitment lasted until the number of kindergartens registered were assumed to yield the planned study sample size. In total, 48

167   kindergartens registered for the study, but two kindergartens were excluded shortly after

168   registration because they had fewer than three children born in 2016.

169   Before randomisation, the pedagogical leaders in participating kindergarten

170   departments were asked to distribute an electronic invitation letter to the parents of children

171   born in 2016. The invitation provided detailed information about the study and a link to the

172   registration web page where parents could register their child for the study. Parents were

173   informed that they consented to participation by registering their child. Inclusion criteria

174   included being born in the year of 2016, and that at least one of the parents was able to read

175   and understand Norwegian. Parents could register their child for the study from late August

176   2017 until the end of October, two weeks before the intervention started in November 2017.

177   All included children turned one year during the year of 2017 when the intervention was

178   carried out, hence named "one-year-olds" throughout the paper. In total, 267 children were

179   registered for the study (figure 1). The baseline questionnaires were sent to parents by email

180   shortly after registration and had to be completed electronically before randomisation.

181

182   **Figure 1.** Flow chart of the trial.

183

184   The kindergartens were randomised to either the control group or one of two intervention

185   groups (group 1 diet and group 2 diet + sapere). The intervention period lasted from

186   November 2017 until February 2018. The post-intervention questionnaires were sent

187   electronically immediately after the intervention period of three months. The intervention

188   kindergartens were given access to a password-protected study website with recipes and

189   information videos developed and designed solely for this study. One of the main parts of the

190   intervention was kindergarten staff serving vegetable-containing dishes to the children (see

191 below, under *Intervention*). However, all study content such as the recipes, instructions

192 regarding the lunch serving and sensory lessons, educational material (videos), and the

193 questionnaires, was delivered digitally, hence defined as a web-based study.

Sample size:

195 The sample size was calculated according to the outcome food neophobia score. A previous

196 cross-sectional analysis of a trial of 505 toddlers in Southern Norway (16) found a mean

197 neophobia score of 18.2 (SD:9.3) among two-year-old children. We assumed that a mean

198 score reduction in the level of food neophobia from 18.2 to 12.0 would be of public health

199 relevance, as studies have shown that children are then generally willing to taste unfamiliar

200 food. If a parent ticked on the lowest or second lowest alternative on the CFNS scale for all

201 the questions, it would result in a score between 6 and 12, representing low levels of food

202 neophobia. A power of 80 % and type 1 error of 5 % suggested 36 participants in each group.

203 To adjust for cluster variation, we assumed an intra-cluster correlation coefficient of 0.1 and a

204 design effect factor of 1.6 expecting 7 participants in each cluster (45). Based on these

205 calculations, we would need 58 participants in each group. Due to a probable loss to follow-

206 up of participants of 20 per cent, we aimed to recruit 70 children in each of the three groups, a

207 total of 210 children for this study.

Randomisation:

209 The first author assigned each kindergarten a number according to when the kindergarten

210 manager registered the kindergarten at the study web page. The first kindergarten to register

211 got number 1, the second to register got number 2, etc. The 46 kindergartens included were

212 randomised into one of three groups after the parents had completed the baseline

213 questionnaire, approximately two weeks before the start of the intervention. The random

214 allocation sequence was generated in SPSS by the last author who had no contact with the

215 kindergartens, nor access to or information from the completed questionnaires. The first

216   author contacted the kindergarten managers to inform them about which group they were

217   randomised to.

218   Intervention:

219   Two password-protected study websites, one for each of the two intervention groups, were

220   developed by Aplia (aplia.no) in collaboration with University web-design personnel and the

221   research group. The intervention *Barns matmot 2.0* was inspired by an earlier non-digital

222   intervention targeting two-year old children in kindergarten, called *Barns matmot –*

223   *Preschoolers Food Courage,* developed by Sissel H. Helland and co-workers (31). The

224   purpose of *Barns matmot 2.0* was to develop a similar intervention adapted to one-year-old

225   children, before the onset of food neophobia, and to make all steps of the recruitment, the data

226   collection, and the information digital. Based on the experiences from the previous study

227   *Barns matmot,* we also aimed to make the intervention *Barns matmot 2.0* somewhat

228   simplified and less time-consuming for the kindergartens (32). The intervention content is

229   further described below.

230   No revision of intervention content was performed during the trial. If the kindergarten

231   personnel had questions during the intervention, there was a telephone number included on

232   the website that they could call and they could also email the contact person.

233   *Intervention element for both intervention groups*

234   Children in both intervention groups were served a warm lunch meal with alternating

235   vegetables for three days a week during the three-month intervention period. The

236   kindergartens had access to the three menus with nine different recipes in a password-

237   protected website especially designed for each intervention group. Each of the three menus

238   had one vegetable in focus, i.e., spinach, celeriac, and fennel (table 1), hereby referred to as

239   intervention vegetables. According to the Norwegian information bureau for fruit and

240   vegetables, the most commonly used vegetables in Norway are: tomato, carrots, onion,

241   cucumber and bell pepper (46). The three intervention vegetables for this study were chosen

242   to represent vegetables less commonly used in Norway. A minimum of two meals per week

243   included the intervention vegetable so that the children were exposed to each vegetable at

244   least six times during the menu period of three weeks. There was a one-week "wash-out

245   break" where the kindergartens could serve their usual lunch meals between the three

246   different menus. The parents of the registered children were also given access to the website

247   with the nine recipes. The first author tested and revised all the recipes in advance to make

248   them easily understandable and uncomplicated.

249

250   **Table 1.** Lunch dishes prepared in the intervention kindergartens.

251

252   *Additional intervention elements for intervention group 2*

253   In addition to the lunch serving, the kindergarten staff in intervention group 2 (diet + sapere)

254   was instructed to implement pedagogical tools including weekly sensory lessons (Sapere

255   method) (27) for the participating children and were given advice on meal practice and

256   feeding practices during mealtime. During the sensory lessons, children were introduced to

257   the intervention vegetable of the month, presented in three different ways; the first week it

258   was presented raw, the second week raw with a dip, and the third week it was presented

259   differently (e.g., baked or otherwise prepared). In this way, children participating in the

260   sensory lessons had three additional exposures of each food compared to intervention group 1,

261   that is, at least nine exposures of the selected intervention vegetables. Recommendations for

262   meal and feeding practices were presented in short informational videos on the study website

263   that was only available to the kindergarten staff and parents in intervention group 2. The

264   videos included information about food neophobia, repeated exposure, role modeling, our five

265   senses, basic tastes, and the Sapere method. The kindergarten staff was encouraged to sit

266   down with the children and eat the same food during lunchtime. The parents of children in

267   intervention group 2 were given access to the website with recipes and information videos.

268   Kindergartens in the control group were asked to continue their usual meal practices

269   and did not get access to any information or web-based material.

270   **Outcomes and measures:**

271   Primary and secondary outcomes of the trial, as well as all measures and instruments, are

272   presented in the study protocol (44). Only primary outcomes of the intervention are included

273   in the present paper. The primary outcomes presented in this paper include child intake of

274   intervention vegetables and all vegetables combined, and level of child food neophobia post-

275   intervention.

276   To evaluate the effect of the two interventions on the given outcomes, parents

277   completed digitally distributed questionnaires at baseline and post intervention. A detailed

278   description on how the outcomes were operationalised is provided below.

279   *Vegetable intake*

280   Child food intake was measured by selected items from a food frequency questionnaire (FFQ)

281   that has been validated and used in large national surveys among one- and two-year-old

282   children in Norway (9, 47-49). The frequency of intake was assessed without specification of

283   the amounts consumed. Questions on how often the child eats a broad selection of vegetables

284   (for example "carrots", or vegetable categories, such as "onions and leek") were included, in

285   addition to questions about fruits, berries, potatoes, bread and cereals, drinks, warm meals and

286   snacks. The response options for the intake of vegetables and how they were re-coded into

287   times per week were: never = 0, <1/month = 0.1, 1-3/month = 0.5, 1-2/week = 1.5, 3-4/week

288   = 3.5, 5-6/week = 5.5, 1/day = 7, 2/day = 14, >3/day = 21.

289   The Norwegian Directorate of Health recommends at least 5 portions of fruits and

290   vegetables per day preferably half (2.5 portions) should be vegetables, i.e., 17.5 portions of

291   vegetables per week. The cut-off for desirable vegetable intake in our analysis was therefore

292   set to 17.5 times per week to assess whether the interventions were effective in increasing the

293   proportion of children that met the national guidelines for vegetable intake. The cut-off for

294   desirable intake of the three intervention vegetables was set to a total of one time per week

295   since they were quite uncommonly eaten, -at baseline, only 17 % were consuming at least one

296   intervention vegetable per week and less than 6 % were consuming at least two.

297   *Child food neophobia*

298   Child food neophobia was measured with a six-item version of Pliner's ten-item Child Food

299   Neophobia Scale (CFNS) (50). The CFNS is a validated tool that uses parental reporting of

300   child food neophobia. The 6-item version of CFNS is commonly used to measure food

301   neophobia in young children and has been used with children as young as 2 years (13, 16, 51,

302   52). The six items were: 1) *My child is constantly sampling new and different foods* (reverse

303   scored) 2) *My child does not trust new foods*, 3) *If my child doesn't know what a new food is*

304   *s(he) won't try it*, 4) *My child is afraid to eat new things s(he) has never had before*, 5) *My*

305   *child is very particular about the things s(he) eats*, and 6) *My child will eat almost anything*

306   (reverse scored). Responses were ranged from "strongly disagree" (1) to "strongly agree" (7)

307   on a 7-point scale. A CFNS score was computed with higher scores indicating higher levels of

308   food neophobia (range 6-42). The CFNS items have been translated from English into

309   Norwegian, and back-translated into English by members of our research group (16).

310   *Other baseline measures*

311   Parents were asked to provide the date of birth and gender of the child, whether she or he was

312   born in Norway.

313   *Measures of parents' socio-demographics*

314   Parents' marital status was assessed with six response options: *single, married, cohabiting,*

315   *separated, divorced* or *other*. The questionnaire asked about the highest completed education

316   of both parents, with five response alternatives: *less than 9 or 10 years of primary school,*

317   *primary school, secondary school or high school, university 4 years or less* or *university more*

318   *than 4 years*. The work situation of the one parent who answered the questionnaire was

319   assessed with the following response alternatives: *work full-time, work part-time,*

320   *"housewife", sick leave, leave, disabled, occupational rehabilitation, student, unemployed* or

321   *other work situation*. In addition, parents entered their gender and their own age in years.

322   Non-Norwegian descent of both parents was approximated by the question of whether they

323   were born in Norway. Parents reported their own weight in kilograms and height in

324   centimeters.

325   *Intervention compliance*

326   Pedagogical leaders were asked to score the degree of compliance with the intervention

327   elements (warm lunches (both intervention groups) and sensory education (only group 2 diet

328   + sapere)) from 1 ("very small degree") to 10 ("very large degree") or 0 ("not completed").

329   The individual scores were added and divided by number of times assessed, leading to a mean

330   score for each element. Mean score for the warm lunches was 9.1 (SD 0.9), with a range from

331   6.8 to 10. Mean score for the sensory education was 8.8 (SD 1.2), ranging from 6.3 to 10.

332   No assessment was made for web use; however, all information was digital, meaning

333   that kindergarten staff had to use the web-based information to conduct and record the

334   intervention elements.

335   **Statistical analysis:**

336   Since the outcomes were collected from a self-reported questionnaire, there was some loss to

337   follow-up meaning that a full intention-to-treat (ITT) analysis could not be performed (53).

338   However, the ITT principle was followed in spirit and those with outcome data were analysed

339   according to the group they were allocated to irrespective of adherence. All analyses were

340   done on the complete cases since no new information can be gained from multiple imputation

341   when only the outcome data are missing and there are no available auxiliary variables related

342   to the missingness (54). However, to address any imbalances that may have resulted from the

343   cluster design and losses to follow-up, we also present a set of adjusted effect estimates,

344   controlling for the baseline values of each outcome, and maternal and paternal education.

345   Baseline characteristics of the three groups (control, diet and diet + sapere) were

346   compared using descriptive statistics. To understand the potential for bias caused by losses to

347   follow-up, these statistics were calculated in the entire sample, in those loss to follow-up and

348   in the complete cases (analysis sample) (55). Descriptive data are presented as mean (SD) or

349   median (IQR) as appropriate, depending on their distribution.

350   Negative binomial models were fitted to estimate the effect of the intervention on the

351   count outcomes of total vegetable intake per day and intervention vegetable intake per week.

352   The per week scale was chosen for intervention vegetables because the count was low.

353   For the binary total vegetable intake ($\geq$17.5 portions per week) and total intervention

354   vegetable intake ($\geq$1 per week) outcomes, Poisson regression was performed. Poisson was

355 preferred over logistic regression because the outcomes were relatively common and hence, in

356 this scenario, risk ratios are much easier to interpret than odds ratios.

357   Linear regression was used to estimate the intervention effects on the child food

358 neophobia score (CFNS). For all inferential analyses, standard errors were corrected for the

359 cluster design with a robust estimator. To check the robustness of the findings to the choice of

360 Poisson model for the binary vegetable intake outcomes, the analyses were repeated using a

361 logistic model. Findings were similar (results available on request). Since CFNS was highly

362 skewed and a log transformation had little effect on its shape, to check the robustness of the

363 CFNS results, we also fitted an ordinal logistic regression model as a sensitivity analysis. This

364 was done to remove the influence of high observations, splitting the outcome into three CFNS

365 groups (<10, 10-19, 20+), where the middle group approximately captured the middle 50 % of

366 the sample at baseline.

367   Data analyses were performed using SPSS Statistics, version 24.0 and 25.0, and Stata

368 version 15.1.

369

Results

Study sample

Out of the 48 kindergartens that registered for the study, two kindergartens were excluded before randomisation because they had fewer than three children born in 2016, leaving 46 kindergartens (267 registered children) that were cluster randomised (figure 1). Twenty-one parents registered for the trial but did not complete the baseline questionnaire, leaving 246 children. Three of the kindergartens (n = 29 children) withdrew consent shortly after randomisation (two of them due to sick leaves and pregnancies among the staff, and one kindergarten withdrew due to economic issues). Seventy-three parents (34%) did not complete the post-intervention questionnaire, leaving 144 children for the main analysis (total loss to follow-up: 102/246 = 41%) (figure 1).

Table 2 presents baseline characteristics of the total sample, and baseline comparisons of the randomised groups, those lost to follow-up and the complete cases to be analysed. Of the children with completed baseline data (n = 246), all were born in Norway, 47.6% were girls, and mean age was 16.7 months. Median intake of vegetables at baseline was 19.2 times per week, and median intake of the three intervention vegetables was 0.1 times per week. Mean score on the CFNS was 14.3 (SD 7.1).

The cluster randomisation produced groups that were broadly comparable at baseline. Mothers without a higher education were more likely to drop out of the study. Among the complete cases there were slightly fewer fathers with a higher education in group 2 (diet + sapere), and a slightly higher baseline intake of intervention vegetables among children in group 1 (diet). To understand whether these imbalances biased our effect estimates, the adjusted models control for these variables.

394   **Table 2:** Baseline characteristics of all participants with answered baseline questionnaire,

395   those lost to follow-up and complete cases.

396

397   The main analyses that estimate the intervention effects are presented in tables 3, 4 and

398   5. Table 3 presents estimates for the effect of the intervention on the number of vegetables

399   consumed per day and the number of intervention vegetables per week. The results from the

400   unadjusted analysis suggests that those in group 1 (diet) consumed on average 24 % (95%CI 0

401   to 52 %) more portions of vegetables per day compared to the control group (p = 0.046).

402   Adjusting for baseline vegetable intake and parental education slightly attenuated this

403   estimate (p = 0.068). The results also suggest that both group 1 (diet) and group 2 (diet +

404   sapere) consumed on average, three to four times more intervention vegetables per week

405   compared to the control group. After adjustment for baseline intake of intervention

406   vegetables and parental education, this effect was still evident for the diet + sapere

407   intervention (group 2, p = 0.02) but was attenuated and no longer statistically significant for

408   the diet only intervention (group 1).

409

410   **Table 3.** Estimates for the effect of the intervention on frequency of total vegetable intake and

411   intervention vegetables intake expressed as incidence rate ratios.

412

413   Table 4 presents the effect estimates for meeting thresholds of total vegetable intake in

414   accordance with national recommendations and for a threshold of intervention vegetable

415   intake. There was no evidence for an effect of the intervention on the likelihood of consuming

416   ≥2.5 servings of vegetables per day (≥17.5 times/week). Adjusting for baseline vegetable

417   intake also made little difference to this result. There was some evidence that the intake of the

418   three intervention vegetables was higher in the intervention groups compared to the control

419   group (table 4). Children in group 1 (diet) were 4.6 times more likely to consume the

420   intervention vegetables at least once a week compared to children in the control group (RR

421   4.64, 95%CI: 1.2 to 17.5, p = 0.02), and children in group 2 (diet + sapere) were 3.3 times

422   more likely to consume the intervention vegetables at least once a week compared to children

423   in the control group (95%CI: 0.8 to 13.1, p = 0.09). After adjusting for the baseline

424   differences in intervention vegetable intake and parental education, these effects were

425   attenuated and the statistical evidence no longer there.

426

427   **Table 4.** Estimates for the effect of the intervention on the probability of having vegetable

428   intake in accordance with national recommendations (all vegetables) and intervention

429   vegetables at least once a week, expressed as relative risks (RR).

430

431   *Food neophobia*

432   Table 5 presents estimates for the effect of the interventions on CFNS. There was a weak

433   suggestion that children in group 1 (diet) had a lower CFNS compared to the control group

434   after the intervention with the mean difference of 2.5-points (p=0.055). However, there was

435   no evidence after adjusting for baseline CFNS and parental education. There was also no

436   evidence for an effect in group 2 (diet + sapere) on the level of food neophobia. In the

437   sensitivity analysis (supplementary table 1) using three categories of CFNS and ordinal

438   logistic regression, there was also no evidence for an effect of either of the interventions on

439   the level of food neophobia.

440

441   **Table 5.** Estimates for the effect of the interventions on child food neophobia score (CFNS).

Discussion

The results of this study suggested that children in both intervention groups had a higher intake of the intervention vegetables after the intervention, but with evidence only for group 2 (diet + sapere) in the adjusted analysis. We also found a weak suggestion that the diet intervention may increase total vegetable intake, but the results were inconclusive. Our study was unable to detect any effect for either intervention group on the level of food neophobia.

A recent meta-analysis (18) revealed that interventions implementing repeated taste exposure of vegetables had better effects than those which did not. The authors of this meta-analysis concluded that eight to ten exposures should be recommended to achieve an increase in intake in children aged two to five years. However, several intervention studies have suggested that as little as three to five exposures to a novel vegetable increases intake of the target vegetable in young children, and that the youngest children requires less exposure than the older children (19-21). In our trial, participants were offered at least six exposures of each of the intervention vegetables. We can only speculate whether an increased number of exposures would have increased the vegetable intake in the participating children.

A recent systematic review of methods for increasing vegetable consumption in early childhood suggests that repeated exposure is a highly effective method for increasing children's vegetable consumption, which may benefit from being paired with modelling by peers of parents (56). In our trial, the repeated exposures were paired with social factors such as modelling by peers and kindergarten staff. In addition, intervention group 2 received sensory lessons, while their parents and kindergarten staff had access to information on relevant subjects such as food neophobia, repeated exposure and role modelling. Multicomponent interventions, like this trial, may have the potential of yielding positive results (57). The results suggested a higher intake of the intervention vegetables in group 2 (diet + sapere), however, there were no indication that intervention group 2 had superior

468   compliance with vegetable recommendations relative to the control group than intervention

469   group 1 (diet). The results on total vegetable intake seemed to favour group 1 (diet), but the

470   effect sizes and confidence intervals for the two intervention groups were quite similar and

471   made it difficult to conclude. This could be due to lack of statistical power because of the

472   large drop-out.

473   The Sapere method is used in both kindergartens and schools in some countries (27).

474   The higher intake of the intervention vegetables in group 2 could be caused by the Sapere

475   sensory lessons, which perhaps made the children more curious about different and novel

476   vegetables. It is also possible that the parents in group 2 were more aware of the use of fennel,

477   spinach, and celeriac because of the focus on these vegetables during the intervention period.

478   In a recent review, the authors argue that sensory lessons do not appear to greatly affect food

479   preferences, but some studies found a decrease in food neophobia, at least in the short term

480   (58). However, the studies referenced in this review were all performed in school-aged

481   children. To our knowledge, there are no other intervention studies on child food neophobia

482   that has targeted children before the onset of food neophobia, normally around the age of two

483   years. Helland et al. (16) found a mean score on the CFNS of 18.2 (SD 9.3) among toddlers

484   with a mean age of 28 months. In our sample of children with a mean age of nearly 17 months

485   at baseline, the mean CFNS was 14.3 (SD 7.1), which supports the perception that food

486   neophobia increases during the period from two years and further (12, 59). We hypothesised

487   that children in intervention group 2 (diet + sapere) would have a lower increase in CFNS

488   than group 1 (diet) due to the sensory education provided in group 2. However, we were not

489   able to detect any difference from the control group in either intervention group. The

490   relatively short intervention period of three months may have made it difficult to detect a

491   difference in the development of food neophobia.

492   A strength of our study concerns generalisability. First, the 43 kindergartens that

493   participated in the study were from four counties in different parts of Norway, both large and

494   small, with private and public kindergartens represented from both urban and rural areas, so it

495   is probable that our results are generalisable to other kindergartens in Norway. The fact that

496   the parents were only asked to complete questionnaires, while the kindergarten staff had to do

497   the tasks necessary to implement the intervention may have reduced a potential selection bias

498   attributable to participant burden. Second, the intervention was conducted in a natural setting,

499   making it conceivable that the intervention can be implemented in kindergartens throughout

500   the country with the internet-based administration approach. This factor makes it easy for

501   kindergarten staff and parents to find and use the recipes and tools. Third, in planning this

502   intervention, we focused on uncomplicated dishes so that kindergarten staff with relatively

503   low cooking skills could manage to carry out the intervention menus. Cooking activities,

504   especially cooking novel food dishes, in kindergarten can be challenging, especially in

505   kindergartens that do not have their own kitchen staff, a situation which is quite common in

506   Norway (32). Fourth, Johannessen et al. found that kindergarten staff experienced the Sapere

507   method successful as an educational tool among toddlers, but that three times a week was too

508   often (32). In our study, the sensory lessons were conducted once a week, a frequency that

509   may be more feasible to implement.

510   There are several limitations of our study that need consideration. First, recruitment of

511   kindergartens and parents turned out to be quite difficult. According to our sample size

512   calculation we needed at least 58 participants in each group for the effect analysis. When the

513   intervention in the kindergartens started, we had baseline data for 246 children, which

514   exceeded the target of 210 children estimated by the original sample size calculation.

515   However, the loss to follow-up was larger than expected because many parents did not

516   complete the follow-up questionnaire. We only used email reminders (n=2) as retention

517 strategy. There might have been fewer lost to follow up had we also included strategies such

518 as monetary incentives (60). The relatively large loss to follow-up meant that our findings

519 remain equivocal for the total vegetable intake outcome. Larger studies are thus warranted,

520 and alternative methods should be considered to avoid large loss to follow-up. Second, the

521 sample of participating parents was relatively homogeneous - the majority were highly

522 educated mothers of Norwegian ethnicity which certainly limits generalisability to other

523 Norwegian ethnic groups. Nonetheless, the education level in Norway is high so the sample of

524 mothers at baseline was quite representative for the general female population in Norway,

525 with 63.9 per cent of the mothers being highly educated (university or college), compared to

526 59.6 per cent of women in the age between 30 to 34 years in the general population (61).

527 Third, the findings of the study are based on parents' self-report, which may have its

528 weaknesses. Self-reported data entail a risk of social desirability bias, both in the form of

529 over- and under-reporting. There are also limitations regarding the questionnaire used to

530 assess food intake. The questionnaire does not measure absolute food intake, only frequency

531 of intake. In our study, the frequency of vegetable intake at baseline was high (a median of

532 almost three times per day). This can probably be a correct measure of frequency of vegetable

533 intake during the day, but the amounts eaten of each vegetable most likely do not correspond

534 to three full vegetable portions per day, which in fact is higher than the recommended intake

535 of vegetables. It is possible that high-frequency users consume very small amounts each time,

536 and the opposite, that low-frequency users consume larger amounts each time. Hence, we

537 cannot exclude the possibility that the intervention resulted in higher total intake of vegetables

538 through increased portion sizes without affecting the frequency of intake to the same degree.

539 Additionally, it can be difficult for parents to report their child's food intake since the child

540 eats many of his/her meals in kindergarten. However, the validation study of the original

541 version of the FFQ for two-years-olds indicated that even if the children are staying in day

542   care the parents seem to be able to report the diet of their child (47). FFQs are frequently used

543   because they are simple, quick and reliable tools compared with other more time-consuming

544   dietary assessment methods (62). We considered the FFQ suitable for use in our study since

545   we primarily wanted it to measure vegetable variety and certain types of vegetables eaten,

546   including vegetables that are eaten seldom, rather than amount of food or calories in the

547   children's diet.

548   Kindergartens are potentially important settings for influencing children's food choice

549   and habit formation at an early age, and there has been a call for intervention studies in this

550   field (63). Web-based study programmes, like the one developed for the present study, have

551   the potential to be both appealing, cost-effective, and capable of reaching large groups of

552   children, parents, and kindergarten staff. However, that relies on kindergartens being willing

553   and able to implement such programmes in their daily routines. The weak evidence regarding

554   the effects of the trial may have been caused both by the low number of complete cases but

555   also by the limited duration of the trial. Three months may be too short a period to achieve the

556   magnitude of effect that we aimed for. We believe that similar trials of longer duration could

557   prove to be effective in improving both vegetable intake and level of food neophobia in young

558   children.

559

Conclusion

Our study suggests that a digitally delivered, dietary- and sensory intervention conducted in kindergartens can promote intake of intervention-targeted vegetables. We also found a very weak suggestion that the diet intervention may increase total vegetable intake, although this requires more investigation. Our study was unable to detect any robust effects for either intervention group on the level of food neophobia. In conclusion, the results suggest that similar scalable web-based diet- and food sensory interventions among 1-year-olds may have utility as a public health nutritional intervention but future studies should be larger, implement procedures to mitigate losses to follow-up and may wish to consider a longer intervention period.

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Figure 1: Flowchart of the trial

Kindergartens invited by e-mail (n = 1043)

Total number of kindergartens registered (n = 48) Total number of children born in 2016 in the kindergartens (n = 377)

> Kindergartens excluded because only one and two children were born in 2016 (n = 2)

Kindergartens included (n = 46) Total number of children included, registered by parent (n = 267)

Randomisation of kindergartens (n = 46) Registered children (n = 267) of which (n = 246) answered baseline questionnaire

Control group (Kindergartens n = 15) Children included[1] (n = 71) Answered baseline[2] (n = 65)	Test group 1 (Kindergartens n = 15) Children included[1] (n = 85) Answered baseline[2] (n = 78)	Test group 2 (Kindergartens n = 16) Children included[1] (n = 111) Answered baseline[2] (n = 103)

> Kindergarten withdrew consent after randomisation (n = 2) registered children (n = 12)

> Kindergarten withdrew consent after randomisation (n = 1) registered children (n = 17)

Start of intervention week 45 year 2017 Kindergartens (n = 43) Children included (n = 238) – of which (n = 222) answered baseline questionnaire

Follow-up post-test February 2018 of which (n = 148) answered post-test questionnaire Complete cases analysed[3] (n = 144)

Control group Analysed (n = 39)	Test group 1 Analysed (n = 42)	Test group 2 Analysed (n = 63)

[1]Children registered for the study by a parent
[2]Answered baseline questionnaire
[3] Children whose parent completed questionnaires at both baseline and post-intervention

768   **Table 1.** Lunch dishes prepared in the intervention kindergartens.

	Vegetarian	Fish	Vegetarian
Menu 1 spinach	Pasta with vegetables and feta cheese (including spinach)	Pan fried fish with carrot purée	Spinach and lentils soup
Menu 2 celeriac	Celeriac soup	Salmon with celeriac purée	Vegetable stew (including celeriac)
Menu 3 fennel	Minestrone soup (including fennel)	Fish cakes with oven baked vegetables (including fennel)	Potato and broccoli omelette

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Table 2: Baseline characteristics of all participants with answered baseline questionnaire, those lost to follow-up and complete cases.

Baseline variable	Total (All participants answered baseline) N = 246	All participants answered baseline (N=246)			Lost to follow-up (N=102) (Did not complete post-intervention questionnaire)			Remaining participants/complete cases (N=144)		
		Control (n=65)	Group 1 (Diet) (n=78)	Group 2 (Diet + Sapere) (n=103)	Control (n=26)	Group 1 (Diet) (n=36)	Group 2 (Diet + Sapere) (n=40)	Control (n=39)	Group 1 (Diet) (n=42)	Group 2 (Diet + Sapere) (n=63)
Number of kindergartens	48	15	16	17	12	14	12	14	14	15
Mean age (months) (SD)	16.7 (3.0)	17.1 (3.2)	16.5 (2.9)	16.5 (2.9)	17.7 (3.0)	16.9 (3.0)	16.6 (3.1)	16.8 (3.4)	16.3 (2.9)	16.4 (3.0)
Gender female N (%)	117 (47.6)	33 (50.8)	39 (50.0)	45 (43.7)	14 (53.8)	12 (44.4)	13 (52.0)	19 (48.7)	24 (57.1)	28 (44.4)
Ethnicity child born in Norway %	100	100	100	100	100	100	100	100	100	100
Parent[a]										
Mean age (years) (SD)	30.9 (5.4)	30.9 (7.2)	30.6 (5.1)	31.1 (4.4)	30.4 (7.8)	31.6 (4.9)	32 (5.5)	31.1 (6.8)	30.2 (5.5)	31.4 (4.0)
Gender Female N (%)	219 (88.7)	60 (92.3)	65 (82.3)	94 (91.3)	24 (92.3)	21 (77.8)	22 (88.0)	36 (92.3)	36 (85.7)	57 (90.5)
Mean BMI (kg/m²)	25.4 (4.4)	26.0 (4.2)	25.0 (4.5)	25.4 (4.4)	23.3 (4.6)	25.0 (4.9)	24.9 (5.0)	26.3 (4.0)	25.3 (5.1)[1]	25.6 (4.4)
Parents living together (%)	94.3	93.8	92.4	96.1	96.2	85.2	92.0	92.3	95.2	96.8
Ethnicity mother born in Norway N (%)	226 (91.5)	58 (89.2)	72 (91.1)	96 (93.2)	21 (80.0)	25 (92.6)	22 (88.0)	37 (94.9)	38 (90.5)	60 (95.2)
Ethnicity father born in Norway N (%)	221 (89.5)	59 (90.8)	72 (91.1)	90 (87.4)	23 (88.5)	25 (92.6)	23 (92.0)	36 (92.3)	39 (92.9)	55 (87.3)
Mothers' education high[b] N (%)	158 (64.0)	37 (56.9)	53 (62.4)	68 (61.3)	9 (34.6)	13 (48.1)	14 (56.0)	28 (71.8)	30 (71.4)	46 (73.0)
Fathers' education high[b] N (%)	104 (42.1)	27 (41.5)	37 (46.8)	40 (38.8)	11 (42.3)	10 (37.0)	12 (48.0)	16 (41.0)	20 (47.6)	20 (31.7)
Child vegetable intake (total)										
Median times per week (IQR²)	19.2 (12.6-26.0)	18.7 (11.2-23.4)	17.6 (12.4-26.8)	20.5 (13.3-28.5)	18.1 (7.7-22.7)	18.3 (13.2-25.5)	21.1 (17.4-30.8)	19.6 (12.8-24.9)	17.1 (11.4-27.4)	18.1 (11.1-26.6)
>=2.5 times per day (>=17.5 per week) - N (%)	139 (56.5)	36 (55.4)	40 (51.3)	63 (61.2)	13 (50.0)	19 (52.8)	30 (75.0)	23 (59.0)	21 (50.0)	33 (52.4)
Child intake of intervention vegetables[c]										
Median times per week (IQR²)	0.1 (0.0-0.5)	0.0 (0.0-0.3)	0.1 (0.0-0.7)	0.1 (0.0-0.5)	0.0 (0.0-0.3)	0.1 (0.0-0.3)	0.1 (0.0-0.7)	0.1 (0.0-0.2)	0.3 (0.0-1.1)	0.1 (0.0-0.5)
>=1 weekly - N (%)	42 (17.0%)	7 (10.8%)	18 (23.1%)	17 (16.5%)	3 (11.5%)	6 (16.7%)	7 (17.5%)	4 (10.3%)	12 (28.6%)	10 (15.9%)
Child food neophobia score (range 6-42)										
Mean (SD)	14.3 (7.1)	14.9 (6.5)	13.7 (6.7)	14.3 (7.9)	16.5 (6.3)	14.3 (6.6)	15.7 (8.3)	13.9 (6.5)	13.1 (6.8)	13.5 (7.5)
Median (IQR²)	12 (8-18)	14 (10-19)	12 (8-17)	12 (8-18)	18 (12.5-20)	12 (10-17)	12 (9.25-23.5)	12 (9-18)	12 (7-17)	11 (7-18)

[a] The parent who filled out the baseline questionnaire
[b] Education high = university or college
[c] Intake of spinach, fennel and celeriac in total

[1] 1 missing
[2] IQR = Interquartile range (25th to 75th percentile)

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777 **Table 3.** Estimates for the effect of the intervention on the frequency of total vegetable intake per day and
778 intervention vegetables per week expressed as incidence rate ratios (IRR).

Outcome	Main (unadjusted analysis)		Secondary (adjusted analysis)*	
	IRR (95% CI)	p	IRR (95% CI)	p
Total vegetable intake (per day)				
Control	Ref.		Ref.	
Group 1 (Diet)	1.24 (1.00-1.52)	0.046	1.20 (0.98-1.47)	0.068
Group 2 (Diet + Sapere)	1.20 (0.92-1.57)	0.171	1.14 (0.93 to 1.39)	0.217
Intervention vegetable intake (per week)				
Control	Ref.		Ref.	
Group 1 (Diet)	3.96 (1.62-9.72)	0.003	1.80 (0.78-4.13)	0.166
Group 2 (Diet + Sapere)	3.10 (1.22-7.84)	0.017	2.63 (1.14-6.05)	0.020

779 *Adjusted for baseline value of outcome, maternal and paternal education.
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Table 4. Estimates for the effect of the interventions on the probability of having vegetable intake in accordance with national recommendations (all vegetables) and intervention vegetables at least once a week, expressed as relative risks (RR).

Outcome	Main (unadjusted analysis)		Secondary (adjusted analysis)*	
	RR (95% CI)	p	RR (95% CI)	p
Vegetable intake (>=17.5 per week)				
Control**	Ref.		Ref.	
Group 1 (Diet)	1.06 (0.76-1.46)	0.74	1.11 (0.83-1.50)	0.46
Group 2 (Diet & Sensory)	1.01 (0.66-1-56)	0.95	1.03 (0.71-1.48)	0.88
Intervention vegetables (≥1 per week)				
Control**	Ref.		Ref.	
Group 1 (Diet)	4.64 (1.23 to 17.5)	0.023	3.08 (0.84 to 11.3)	0.091
Group 2 (Diet & Sensory)	3.30 (0.83 to 13.1)	0.09	2.85 (0.77 to 10.46)	0.12

*Adjusted for baseline intake of outcome, maternal and paternal education

**The control group is the reference group, RR = 1.0

791 **Table 5**. Estimates for the effect[*] of the interventions on child food neophobia score (CFNS).

Outcome	Main (unadjusted analysis)		Secondary (adjusted analysis)[a]	
	Mean diff. v control group (95% CI)	p	Mean diff. v control group (95% CI)	p
CFNS				
Control	Ref.		Ref.	
Group 1 (Diet)	-2.5 (-5.1 to 0.1)	0.055	-2.0 (-4.5 to 0.6)	0.12
Group 2 (Diet + Sapere)	-0.7 (-4.4 to 2.9)	0.69	-0.5 (-2.7 to 1.7)	0.67

792 *From a linear regression
793 [a]Adjusted for baseline value of outcome, maternal and paternal education.

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797 **Supplementary table 1.** Odds ratios[*] for being in a higher food neophobia group (<10; 10 to 19; 20+) i.e., more
798 neophobia, based on the CFNS post-intervention according to treatment group.

Outcome	Main (unadjusted analysis)		Secondary (adjusted analysis)[**]	
	OR (95% CI)	p	OR (95% CI)	p
CFNS				
Control	REF		REF	
Group 1 (Diet)	0.68 (0.33 to 1.38)	0.28	0.72 (0.30 to 1.72)	0.46
Group 2 (Diet + Sapere)	0.72 (0.30 to 1.73)	0.47	0.77 (0.35 to 1.69)	0.51

799 [*]From an ordinal logistic regression
800 [**]Adjusted for baseline value of outcome, maternal and paternal education

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Appendix 1

Links to the intervention's websites and illustrations of the websites

Links to the project web pages

http://matmot.uia.no/ (Information and registration page for the kindergartens)

http://matmot.uia.no/registrer-barn (Information and registration page for parents)

http://matmot.uia.no/testgruppe-1 (Password protected page for group 1)

http://matmot.uia.no/testgruppe-2 (Password protected page for group 2)

The Front Web-page on the website for intervention group 1

Testgruppe 1

Her finner du oppskriftene til prosjektet. Hver meny har oppskrifter til tre ulike retter som skal serveres på tre valgfrie dager i løpet av en uke. De andre to dagene kan dere servere det dere ønsker eller vanligvis pleier. Dere starter med meny 1 i uke 45 og serverer alle tre rettene hver uke i tre uker, før dere tar en ukes pause hvor dere kan servere det dere ønsker eller vanligvis pleier i barnehagen. Deretter går dere over til meny 2 i uke 49 og serverer alle tre rettene hver uke i tre uker, før dere tar to ukers pause (grunnet juleferie) før dere begynner på meny 3 som også serveres i tre uker.

Til hver meny finner dere tre korte evalueringsskjemaer. For å kunne si noe om tiltaket virker, er vi avhengig av å vite om barnehagen har laget og servert maten som står på planen. Fyll ut ett evalueringsskjema per uke ved å klikke på lenken på venstre side av menyen.

Før dere går i gang bør dere lese "Kjøkkenutstyr og basismatvarer". Det står også mye nyttig informasjon i "Bra mat i barnehagen" som dere kan se på når dere har mulighet. Vi oppfordrer særlig de som har ansvar for matlagingen i barnehagen om å lese kapittel 7 om hygiene ved matlaging og kapittel 8 om matallergier.

Meny 1

Her er menyen for første periode. Alle tre rettene skal serveres i løpet av en uke. Menyen serveres i tre sammenhengende uker.
Denne periodens fokusgrønnsak er spinat.

Evalueringsskjemaer

- Skjema for uke 1
- Skjema for uke 2
- Skjema for uke 3

| Pasta med grønt | Stekt fisk med gulrotpuré | Spinat- og linsesuppe |

Meny 2

Her er menyen for andre periode. Alle tre rettene skal serveres i løpet av en uke. Menyen serveres i tre sammenhengende uker.
Denne månedens fokusgrønnsak er sellerirot.

Evalueringsskjemaer

- Skjema for uke 1
- Skjema for uke 2
- Skjema for uke 3

| Sellerirotsuppe | Laks med sellerirotpuré | Grønnsakslapskaus |

Meny 3

Her er menyen for tredje periode. Alle tre rettene skal serveres i løpet av en uke. Menyen serveres i tre sammenhengende uker.
Denne månedens fokusgrønnsak er fennikel.

Evalueringsskjemaer

- Skjema for uke 1
- Skjema for uke 2
- Skjema for uke 3

| Minestronesuppe | Fiskekaker med grønnsaker | Bondeomelett |

Råd, tips og oppskrifter

Her finner dere lenke til Helsedirektoratets brosjyre "Bra mat i barnehagen". Barnehageansatte oppfordres til å særlig lese kapittel 7 om hygiene ved matlaging, og kapittel 8 om matvareallergier.

Last ned PDF

Kjøkkenutstyr og basismatvarer

Her finner du en liste over kjøkkenutstyr dere behøver og basismatvarer som det kan være bra å ha i barnehagen før dere setter i gang prosjektet.

Kjøkkenutstyr

Norske Kvinners Sanitetsforening   SØRLANDET SYKEHUS   UNIVERSITETET I AGDER

info@matmot.no

The Front Web-page on the website for intervention group 2

Testgruppe 2

Her finner du oppskriftene til prosjektet. Hver meny har oppskrifter til tre ulike retter som skal serveres på tre valgfrie dager i løpet av en uke. De andre to dagene kan dere servere det dere ønsker eller vanligvis pleier. Dere starter med meny 1 i uke 45 og serverer alle tre rettene hver uke i tre uker, før dere tar en ukes pause hvor dere kan servere det dere ønsker eller vanligvis pleier i barnehagen. Deretter går dere over til meny 2 i uke 49 og serverer alle tre rettene hver uke i tre uker, før dere tar to ukers pause (grunnet juleferie) før dere begynner på meny 3 som også serveres i tre uker.

Til hver meny finner dere tre korte evalueringsskjemaer. For å kunne si noe om tiltaket virker er vi avhengig av å vite om barnehagen har gjennomført saperesamlingene som planlagt og i hvilken grad barnehagen har laget og servert maten som står på planen. Fyll ut ett evalueringsskjema per uke ved å klikke på lenkene som ligger på venstre side av menyene.

Dere skal gjennomføre én saperesamling hver uke. Mer informasjon om saperesamlingene finner dere under menyoverskriftene, og i de to filmene som kalles "Sapere" og "Saperesamling".

Før dere går i gang bør dere lese "Kjøkkenutstyr og basismatvarer". Det står også mye nyttig informasjon i "Bra mat i barnehagen" som dere kan se på når dere har mulighet. Vi oppfordrer særlig de som har ansvar for matlagingen i barnehagen om å lese kapittel 7 om hygiene ved matlaging og kapittel 8 om matallergier.

Meny 1

Her er menyen for første periode. Alle tre rettene skal serveres i løpet av en uke. Menyen serveres i tre sammenhengende uker.
Denne periodens fokusgrønnsak er spinat.
Se saperesamling meny 1.

Evalueringsskjemaer
- Skjema for uke 1
- Skjema for uke 2
- Skjema for uke 3

Pasta med grønt

Stekt fisk med gulrotpuré

Spinat- og linsesuppe

Meny 2

Her er menyen for andre periode. Alle tre rettene skal serveres i løpet av en uke. Menyen serveres i tre sammenhengende uker.
Denne månedens fokusgrønnsak er sellerirot.
Se saperesamling meny 2.

Evalueringsskjemaer
- Skjema for uke 1
- Skjema for uke 2
- Skjema for uke 3

Sellerirotsuppe

Laks med sellerirotpuré

Grønnsakslapskaus

Meny 3

Her er menyen for tredje periode. Alle tre rettene skal serveres i løpet av en uke. Menyen serveres i tre sammenhengende uker.
Denne månedens fokusgrønnsak er fennikel.
Se saperesamling meny 3.

Evalueringsskjemaer
- Skjema for uke 1
- Skjema for uke 2
- Skjema for uke 3

Minestronesuppe

Fiskekaker med grønnsaker

Bondeomelett

Videoer

Her er korte videofilmer som gir nyttig informasjon til prosjektet.
Både barnehageansatte og foreldre oppfordres til å se disse filmene.

Sapere og sansene våre

MOT TIL Å SMAKE: Saperemetoden gir barn barn mulighet til å bli kjent med sansene sine og sin egen smak.

Saperesamling

SANSER: Saperesamlingen skal lære barnehagebarn å bli bevisst sine fem sanser og bruke disse i forhold til mat. Denne videoen gir et innblikk i hvordan en saperesamling foregår.

Sapere og sansene våre

MOT TIL Å SMAKE: Saperemetoden gir barn barn mulighet til å bli kjent med sansene sine og sin egen smak.

Saperesamling

SANSER: Saperesamlingen skal lære barnehagebarn å bli bevisst sine fem sanser og bruke disse i forhold til mat. Denne videoen gir et innblikk i hvordan en saperesamling foregår.

De fem grunnsmakene

BALANSE: Å smake til maten er en teknikk du kan ha mye glede av å kunne. Det handler om å finne en balanse mellom de fem grunnsmakene søtt, salt, surt, bittert og umami.

Matneofobi

FRYKT: Matneofobi er frykt for ny mat og er en naturlig del av barns utvikling.

Rollemodell

OMSORGSPERSONER: Foreldre og barnehageansatte er viktige rollemodeller for barna når det kommer til mat.

Råd, tips og oppskrifter

Her finner dere lenke til Helsedirektoratets brosjyre "Bra mat i barnehagen". Barnehageansatte oppfordres til å særlig lese kapittel 7 om hygiene ved matlaging, og kapittel 8 om matvareallergier.

Last ned PDF

Kjøkkenutstyr og basismatvarer

Her finner du en liste over kjøkkenutstyr dere behøver og basismatvarer som det kan være bra å ha i barnehagen før dere setter i gang prosjektet.

Kjøkkenutstyr

Appendix 2

The menus and recipes

Meny uke 1:

Månedens grønnsak: spinat

Meny 1

Her er menyen for første periode. Alle tre rettene skal serveres i løpet av en uke. Menyen serveres i tre sammenhengende uker. Denne periodens fokusgrønnsak er spinat.

Pasta med grønt — Stekt fisk med gulrotpuré — Spinat- og linsesuppe

Oppskrift nummer 1:

Pasta med spinat, squash, soltørket tomat, rødløk og fetaost.

Tidsbruk cirka 20 minutter

Til fire voksne/8 barn:

400 gram pasta (f.eks pastaskruer eller pastapenne)

olivenolje

1 rødløk i tynne båter

½ squash i biter (del squashen først i to på langs, del så hver halvdel i to på langs og skjær skiver)

8 soltørkede tomater i biter (gjerne fra glass, i olje)

200 gram fersk spinat (en stor pose)

1 dl av pastavannet

salt og pepper

100 gram fetaost i små terninger

Legg fram det du trenger av grønnsaker og redskaper. Kok opp rikelig lettsaltet vann til pastaen. Kutt grønnsaker som anvist mens du venter på at pastavannet skal koke. Pastaen kokes etter anvisning på pakken. Ta vare på 1 dl av pastavannet og hell av resten. Ringle litt olivenolje over den ferdigkokte pastaen så den ikke kleber så lett.

Mens pastaen koker: stek rødløk og squash i 1-2 ss matolje i en stor stekepanne på middels varme til grønnsakene begynner å bli myke. Tilsett soltørket tomat og spinat og rør alt godt sammen. Varmes til spinaten begynner å falle sammen etter et par minutter.

Bland spinatblandingen med pastaen. Spe med litt av pastavannet hvis det virker litt tørt.
Smuldre fetaost over retten og server.

Allergitilpasning:
Melkeallergi: dropp osten i den ferdige retten, men den fram i en skål og tilby til de barna som kan ha det.

Oppskrift nummer 2:
Pannestekt fiskefilet med gulrotpuré, aspargesbønner og poteter
Tidsbruk cirka 30 minutter
Til 4 voksne:

600 gram hvit fiskefilet, skinn og benfri. (Sei, rødspette, torsk, lyr, fryst fisk kan brukes om dere ikke har tilgang på fersk fisk)
salt og pepper
4 ss rugmel
1 ss matolje
1 ss smør

Gulrotpuré:
4 store gulrøtter, skrelt og delt i biter
1 ss smør
1 ts honning (skal ikke brukes til barn under 1 år, bruk i så fall sukker eller sirup)

Finrevet skall og saften av ½ sitron

Salt og pepper

8 eggestore poteter

1 pakke ferske aspargesbønner/brekkbønner (kan erstattes med fryste dersom dere ikke finner de ferske)

Framgangsmåte:

Sett potetene til koking, de tar lengst tid, cirka 20-30 minutter. Legg fram det du behøver av råvarer og redskap. Begynn med å skrelle og kutte gulrøtter. Mens gulrøttene koker kan du sette over en kjele med vann til aspargesbønnene og forberede fisken ved å sjekke denne for ben, dele i porsjonsstykker, salte og pepre.

Gulrotpuré: kok gulrotbitene møre. Ta vare på kokevannet. Bruk stavmikser og mos gulrøttene med litt av kokevannet, smør, honning/sirup, sitron og en liten klype salt. Spe med kokevannet til du har fin purékonsistens. Smak til med eventuelt litt mer salt, sitron eller pepper.

Stekt fisk: vend fiskebitene i rugmel og legg de i varm panne med smør og olje. Fisken trenger bare et par minutters steking på hver side, til de blir gylne og sprø.

Gi bønnene et oppkok i lettsaltet vann rett før servering, maks ett minutt. Hell av vannet og skyll med litt kaldt vann så de holder seg sprø.

Server fisken med gulrotpuré, kokte poteter og dampede bønner.

Allergitilpasning:

Cøliaki: bytt rugmelet med grov glutenfri melblanding.

Melkeallergi: bytt smøret med melkefri margarin i puréen, bruk kun olje til steking av fisk.

Sitrus: dropp sitron i puréen, smak eventuelt til med noen dråper epleeddik for syrlighetens skyld.

Fiskeallergi: sjekk med foreldrene om det gjelder alle typer fisk. Tilby noe barnet tåler, eventuelt kylling eller kjøtt i stedet.

Oppskrift nummer 3:

Spinat- og linsesuppe med creme fraiche og valnøttdryss

Tidsbruk cirka 25 minutter

Til 4 voksne:

100 gram tørre, grønne linser

1 liter vann

1 grønnsaksbuljongterning

200 gram frisk spinat (1 stor pose)

1 sjalottløk eller 1 liten gul løk

1 fedd hvitløk

1 ss matolje

salt og pepper

4 ss lett creme fraiche

30 gram valnøttkjerner

Tilbehør: halvgrovt brød eller rundstykker med plantemargarin

Framgangsmåte: kok linsene møre i vann med grønnsaksbuljong. Hold tilbake et par desiliter av vannet og bruk evt. dette til å spe suppen med helt tilslutt etter den er most sammen. Suppen skal være litt tykk så det blir lettere for barna å spise den. Koketid cirka 20 minutter.

Mens linsene koker kan du hakke valnøttkjerner og legg de i en eller flere skåler til servering. Kutt løk og hvitløk i biter, stekes i litt olje i en gryte/kjele til de begynner å bli myke, tilsett spinaten og stek den med til den faller sammen, cirka ett minutt. Dersom du skal lage til mange kan du steke spinat i flere omganger. Ha spinat- og løkblandingen i linsesuppen. Småkokes kun 1-2 minutter så spinaten bevarer sin friske, grønne farge. Kjør suppen helt glatt med en stavmikser. Spe eventuelt med mer vann hvis suppen blir tykk, men den bør ha litt tykkelse så det er lett for de små og spise den. Smak til med litt salt og pepper, men husk at også buljongen er salt. Legg en spiseskje creme fraiche og et lite valnøttdryss på toppen av hver skål suppe. Server med godt brød med plantemargarin.

Allergitilpasning:

Melkeallergi: dropp creme fraiche eller bruk eventuelt rømmeerstatning av soya eller havre, eller kokoskrem.

Nøtteallergi: dropp nøttene. Nøttene kan erstattes med ristede gresskarkjerner dersom det tolereres.

Oppskrifter til saperesamlinger:

Uke 1: skyll spinatbladene før samlingen. Bruk helst babyspinat siden de skal spises rå, bladene er mindre og mer håndterlige for de små, bladene er dessuten litt mindre «trådete».

Uke 2: yoghurtdip med frisk mynte.

1,5 dl yoghurt naturell eller matlagingsyoghurt
½ -1 ts flytende honning eller sukker (bruk sukker dersom dere har med barn under 1 år)
7-8 blader finhakket frisk mynte (dersom det er vanskelig å få tak i frisk mynte kan frisk basilikum brukes, eventuelt fersk bladpersille.)
Smak til med ørlite salt og pepper

Uke 3: med fetaost. Både hel blokk og biter på glass kan brukes. Bruk fetaost lagd av kumelk (f.eks apetina eller dagros). Del fetaosten i små terninger. Hvis dere bruker fetaost på glass kan dere dele hver ferdigkuttede terning i to biter. La barna forsøke å pakke inn en liten ostebit i et blad spinat. Barna kan oppfordres til å smake både på rene spinatblader og blader med ost.

Meny uke 2

Månedens grønnsak: Sellerirot

Meny 2

Her er menyen for andre periode. Alle tre rettene skal serveres i løpet av en uke. Menyen serveres i tre sammenhengende uker.
Denne månedens fokusgrønnsak er sellerirot.

Sellerirotsuppe

Laks med sellerirotpuré

Grønnsakslapskaus

Oppskrift nummer 1:

Sellerirotsuppe med stekt eple- og baconblanding

Tidsbruk cirka 25-30 minutter

Til 4 voksne:

500 gram sellerirot i terninger

2 poteter, skrelt og delt i biter

1 liten gul løk, finhakket

2 ss matolje

6 dl vann

1 grønnsaksbuljongterning

4 dl melk

Evt. salt og pepper

Eple- og baconblanding:

150 gram bacon i terninger

1 eple i små terninger

friske krydderurter dersom dere har (gressløk, timian, persille)

Framgangsmåte:

Legg fram alt du behøver av råvarer og redskaper. Skrell og kutt grønnsaker i biter. Stek løken myk i olje, tilsett poteter, sellerirot, vann og grønnsaksbuljong. Kokes til grønnsakene er møre, cirka 15-20 minutter. Mens grønnsakene småkoker kan du skrelle og kutte eplet i små terninger, kutte bacon og steke baconet sprøtt i en stekepanne, tilsett eplebiter og eventuelt litt krydderurter mot slutten av steketiden og la eplene surre med 1-2 minutter.

Kjør suppen glatt med stavmikser. Tilsett melk til ønsket konsistens, det er ikke sikkert du trenger all melken. Suppen bør være litt tykk slik at det er lett for de minste barna å spise den med skje.

Server suppen med litt av eple- og baconblandingen og litt godt brød med plantemargarin.

Allergitilpasning:

Melkeallergi: bruk melk- eller fløteerstatninger av soya eller havre.

Dersom dere ønsker en vegetarisk rett kan baconet droppes, eller erstattes med 1 stor rødløk i biter og 1 stang selleri i små biter.

Oppskrift nummer 2:

Ovnsbakt laksefilet med sellerirotpuré og brokkoli

Tidsbruk cirka 25-30 minutter

Til 4 voksne:

4 stykker laksefilet, totalt cirka 400 gram laks uten skinn og ben.

Salt og pepper

1 stk brokkoli i buketter

Sellerirotpuré:

500 gram sellerirot, i terninger

3 poteter, skrelt i terninger

2 ss plantemargarin eller smør

salt og pepper

Framgangsmåte:

Legg fram råvarer og redskaper du behøver. Start med sellerirotpuréen. Kok grønnsakene møre i vann, cirka 15 minutter. Mens grønnsakene koker forbereder du laksen: Legg laksefiletene i en ildfast form med skinnskiden ned. Dersom du har skinnfri laksefilet så smør formen med 1 ss matolje. Dryss på litt salt og eventuelt pepper. Stekes på 180 grader i 10-12 minutter. Pass på at laksen ikke steker så lenge at den blir tørr.

Hell av alt kokevannet av grønnsakene og tilsett smør/margarin. Kjør med stavmikser til en jevn puré, eller mos grønnsakene med en potetstapper. Smak til med litt salt og pepper. Selleriroten er nokså vannholdig, men dersom du synes puréen blir litt fast kan du tilsette en skvett melk, fløte eller melkeerstatning.

Kok opp lettsaltet vann, legg i brokkolibukettene og la de koke i 2 minutter. Hell av vannet og skyll brokkolien raskt i kaldt vann så kokeprosessen stopper opp og den bevarer tyggemotstanden og den friske fargen.

Server fiskefilet med sellerirotpuré og brokkoli.

Allergitilpasning:

Fiskeallergi: sjekk med foreldrene om det gjelder alle typer fisk. Tilby barnet noe det tåler, eventuelt kylling eller kjøtt.

Oppskrift nummer 3:

Grønnsakslapskaus

Tidsbruk cirka 25 minutter + tiden det tar å skrelle og kutte grønnsaker (Kan gjøres

klart på morgenen eller dagen før, dekk i så fall de ferdigkuttede grønnsakene med vann og sett kjølig)

Til 4 voksne:

4 poteter

4 gulrøtter

1 pastinakk (evt. ½ purreløk hvis det er vanskelig å finne pastinakk)

1 sellerirot

1 kålrot

6 dl vann

1 grønnsaksbuljongterning

evt. litt salt og pepper

evt. litt potetmospulver (uten melk) eller maisenna jevner

Tilbehør: flatbrød eller brød/rundstykker med plantemargarin

Framgangsmåte: Skrell og kutt alle grønnsakene i små terninger, cirka 0,5 x 0,5 cm. Hell på vann, det behøver ikke dekke grønnsakene helt, og smuldre en terning buljong over. Hold gjerne tilbake litt av vannet så ikke lapskausen blir for tynn, og spe heller til slutt.

Kok til grønnsakene er møre, 20-25 minutter. Dersom lapskausen blir tynn kan du gjerne jevne den med et par spiseskjeer potetmospulver eller litt maisenna jevner. Smak til med salt og pepper, men husk at også grønnsaksbuljongen er salt.

Server lapskausen med brød eller flatbrød.

Saperesamlinger:

Uke 1: selleriroten behøver bare skrelles og kuttes i tynne staver, dette gjøres i samlingen etter at barna har fått sett, kjent og luktet på den hele/halve selleriroten.

Uke 2: Begynn med hel/halv sellerirot også i denne samlingen. Skrelles og kuttes i staver.

Oppskrift til epledip:

½ beger lettrømme

¼-½ revet eple

½ ts sukker

½ ts sitronsaft

Uke 3: Bak staver av sellerirot i forkant av saperesamlingen. Ha med både rå og bakt sellerirot til samlingen. Barna bør oppfordres til å smake begge deler.

Bakt sellerirot:

Sellerirot (tilpass mengde etter antall barn, beregn 1-2 staver til hvert barn og 1-2 til den voksne)

2 ss olivenolje eller annen matolje

Et lite dryss salt

Skrell og skjær staver. Legg i ildfast form med litt olje i bunnen. Dryss over ørlite salt. Bak i ovnen på 200 grader i cirka 15-20 minutter.

Meny nummer 3:

Månedens grønnsak: fennikel

Meny 3

Her er menyen for tredje periode. Alle tre rettene skal serveres i løpet av en uke. Menyen serveres i tre sammenhengende uker.
Denne månedens fokusgrønnsak er fennikel.

Minestronesuppe

Fiskekaker med grønnsaker

Bondeomelett

Oppskrift nummer 1:

Minestronesuppe

Tidsbruk cirka 30 minutter

Til 4 voksne:

2 ss matolje

2 hvitløksfedd, finhakket

1 gul løk, finhakket

2 poteter, skrelt i terninger

2 gulrøtter, skrelt i terninger

½ sellerirot i små terninger

1 fennikel i små terninger

1 liter vann

1 grønnsaksbuljongterning

1 boks hakkede tomater

1 boks store hvite bønner, eventuelt kidneybønner

100 gram fullkornspasta (makaroni eller skruer)

2 ts tørket oregano eller pizzakrydder

Tilbehør:

Flatbrød

Framgangsmåte:

Legg fram det du trenger av råvarer og utstyr. Skrell og kutt alle grønnsakene. Surr løk og hvitløk blank i olje. Tilsett de hakkede grønnsakene, vann, grønnsaksbuljong og tørket oregano. Kok i cirka 10 minutter. Tilsett pastaen og kok videre i 5-10 minutter (avhenger av type pasta) til pastaen er al dente og grønnsakene møre. Tilsett bønner tilslutt. Smak til med salt og pepper, men husk at også grønnsaksbuljongen er salt. Dryss over ferske krydderurter dersom du har det (timian, basilikum, persille). Server suppen med flatbrød.

Oppskrift nummer 2:

Fiskekaker med ovnsbakte grønnsaker og rømmesaus

Tidsbruk cirka 30-40 minutter

Til 4 voksne:

4 store fiskekarbonader eller 8-10 fiskekaker, velg noen med høy andel fisk, helst 60 prosent eller mer.

Olivenolje eller annen matolje

6 mellomstore poteter av kokefast type, vaskes og deles i båter

4 gulrøtter i halvmåner, skiver eller staver

1 rødløk i tynne båter

1 fennikel i tynne båter

Tørkede krydderurter (for eksempel oregano, timian eller pizzakrydder)

Rømmesaus:

2 dl lettrømme eller lett creme fraiche

1-2 ss frisk gressløk

1 ts sitronsaft

0,5 ts sukker

Framgangsmåte:

Bland grønnsakene med 2 ss olje i en stor ildfast form (grønnsakene skal kunne spres godt utover og ikke ligge i flere lag oppå hverandre, da blir de kokt i stedet for stekt). Dryss over krydderurter og en liten klype salt. Stek grønnsakene i cirka 20-30 minutter til potetene er møre.

Varm fiskekakene på begge sider i litt olje i en stekepanne til de er gjennomvarme. Kan også varmes i ildfast form med aluminiumsfolie over i stekovnen på 200 grader i cirka 15 minutter.

Rør sammen ingrediensene til rømmesausen.

Allergitilpasning:

Cøliaki/glutenallergi: sjekk at fiskekakene er uten gluten. De fleste typer er det. Hvis ikke kan glutenfri fiskepudding eller ren fiskefilet brukes.

Melkeallergi: bruk melkefrie fiskekaker/fiskekarbonader hvis dere finner dette. Dersom dette er vanskelig å finne, bruk ren fiskefilet. Erstatt rømmen med rømmeerstatning basert på soya eller havre, eventuelt bruk ferdigkjøpt remulade som er uten melk.

Fiskeallergi: Tilby barnet det gjelder noe det tåler, for eksempel kylling eller kjøtt.

Sitrus: hold av litt av rømmesausen til barnet det gjelder før du smaker til med sitron.

Oppskrift nummer 3:

Bondeomelett med poteter og brokkoli

Tidsbruk cirka 40 minutter (cirka 25 minutter dersom potetene er kokt på forhånd)

For 4 voksne:

4 kokefaste poteter

½ brokkolihode, i små buketter

1 ss matolje

6 egg

1,5 dl melk

salt og pepper

Tilbehør:

Brød eller rundstykker

Plantemargarin

Framgangsmåte:

Kok potetene i lettsaltet vann til de er gjennomkokt, cirka 20-25 minutter. Skrelles og deles i biter eller halvmåner.

Kok små brokkolibuketter i lettsaltet vann i cirka ett minutt.

Pisk sammen egg og melk, krydre med litt pepper og en klype salt.

Legg poteter og brokkoli i en stor stekepanne med litt matolje. Hell over eggeblandingen og sett på lokk. Stekes på lav til middels varme (så ikke den brenner seg) til eggestanden har stivnet. Steketiden avhenger av tykkelsen på omeletten, cirka 10-15 minutter. Dersom dere lager omelett til mange, og dobler eller flerdobler oppskriften, kan omeletten også stekes i store ildfaste former i stekeovnen på 200 grader. Steketid cirka 20 minutter, litt avhengig av tykkelsen på omeletten.

Server omeletten med brød eller rundstykker og plantemargarin.

Allergitilpasning:

Melkeallergi: Melken kan erstattes med vann eller melkeerstatning av havre eller soya til hele barnegruppen.

Eggeallergi: dropp omeletten til barnet det gjelder. Legg av noen biter kokte poteter og brokkoli og server med brød med margarin og ost eller kjøttpålegg.

Saperesamlinger:

Uke 1: skyll fennikelen før samling. Send rundt hele fennikelen så barna kan lukte og ta på før den skjæres i tynne strimler på langs som barna kan smake.

Uke 2: hel eller halv fennikel som skjæres i strimler på langs som kan spises som de er eller dyppes i en enkel rømmedip.

Oppskrift rømmedip:
½ boks lettrømme
1 ts sitronsaft
½ ts sukker
smak til med ørlite salt og pepper

Uke 3: ta med en hel/halv rå fennikel til samlingen, og litt bakt fennikel så barna kan se, lukte og smake både rå og bakt.

Oppskrift på bakt fennikel:

½ eller 1 fennikel (litt avhengig av størrelsen på barnegruppen, det skal bare være en liten smaksprøve på hver)
1-2 ss matolje
Et lite dryss salt og evt ørlite pepper

Del fennikelen i båter og legg i ildfast form med litt olje i bunnen. Dryss på litt salt. Bakes i ovnen på 175 grader i 15-20 minutter.

List of recommended kitchen utensils and basic ingredients for cooking

Her er en oversikt over kjøkkenutstyr og basismatvarer som er kjekke å ha i barnehagen før dere setter i gang med prosjektet. Dersom dere mangler mye av det kjøkkenutstyret som er nevnt under så kan dere ta kontakt med oss.

Anbefalt kjøkkenutstyr i barnehagen:

-Stor skjærefjøl

-Et par gode kniver (for eksempel en kokkekniv og en mindre grønnsakskniv)

-Grønnsakskreller

-Stekepanne

-En romslig kjele til supper

-En kjele med lokk (til for eksempel poteter)

-Ildfaste former (til for eksempel baking av grønnsaker eller fisk i ovnen)

-Stor plastbolle med lokk (til å oppbevare for eksempel kuttede grønnsaker i vann)

-Stavmikser (til å lage glatte supper og puréer)

-Aluminiumsfolie/grillfolie

Basismatvarer som bør være tilgjengelige i barnehagen:

-Olivenolje til matlaging

-Matolje til steking, for eksempel raps- eller solsikkeolje

-Salt, pepper og tørket oregano/pizzakrydder

-Flytende honning

-Sukker

-Grønnsaksbuljongterninger

-Smør eller margarin (ikke lett/light)

-Sitronsaft (presset sitron på flaske for eksempel ReaLemon eller Sicilia)

Information about the sapere sensory lessons

Generell informasjon om saperesamlingene.

Det skal gjennomføres en saperesamling per uke mens prosjektet pågår. Samtidig som dere har en ukes pause mellom de ulike menyene kan dere også ha en pause fra å gjennomføre saperesamlinger. Månedens fokusgrønnsak i saperesamlingene er en grønnsak som også går igjen i oppskriftene den samme måneden. Husk å handle inn litt ekstra av fokusgrønnsaken når dere handler inn til ukens meny.

For en innføring i sapere se filmene «Sapere og sansene våre» og «Saperesamling».

Ideelt antall barn i saperesamlingene er 3-5 barn, og maksimalt 6 barn per gruppe. Dersom dere har en barnegruppe i prosjektet som er flere enn 6 barn bør de deles i to grupper når det skal holdes saperesamling. Enten kan to pedagoger ha saperesamling samtidig i to ulike rom, eller en og samme pedagog kan ha to grupper etter hverandre, eller så kan de ulike gruppene ha samlingsstunden på ulike ukedager.

Husk:

Voksne og barn vasker hender før saperesamlinger.

Ha oversikt over barn med matvareoverfølsomhet eller allergi. Prøv så langt det er mulig å tilby alternativer som ligner på den maten som ikke tåles, for eksempel tilby rømmeerstatning basert på havre, soya eller kokos i stedet for rømme ved melkeallergi.

Det er frivillig å smake.

Innhold i saperesamlingene:

Samlingen starter gjerne med at pedagogen går gjennom de fem sansene ved hjelp av bildekort og barna finner egne sanseorganer. De minste barna har foreløpig lite språk. Pedagogen kan hjelpe med å finne ord og beskrivelser for det dere sanser.

Hunden Sapere kommer på besøk. Lag gjerne en lekende introduksjon med hunden. Han har med seg månedens grønnsak i boksen. Barna kan gjerne kose med hunden før et av barna, eller hunden ved hjelp av pedagogen, åpner Sapereboksen.

1. Kjenn med hånden hvordan grønnsaken føles? Send rundt. La barna kjenne på grønnsaken. Er den glatt, kald, myk, ruglete osv. (Vent med å smake)
2. Lukter grønnsaken noe? La barna lukte. Minner lukten om noe?
3. Hva ser vi? For eksempel størrelse, farger, mønster.
4. Skjær opp små smaksprøver og send rundt. Hvem vil smake? Pedagogen og hunden Sapere vil også smake litt. Hva smaker det? Klarer dere å beskrive smak ved hjelp av ord eller ansiktsuttrykk?
5. Lager det lyd når vi spiser? Beskriv lyder.

Når vi vurderer mat og måltid bruker vi en kombinasjon av flere sanser. Gjennom økt bevissthet på farger, smaker, konsistenser, lukter og lyder kan barn bli venn med egne sanser. Det stimulerer til økt matnytelse og matglede.

Aktuelle ord og beskrivelser:

Sanser og sanseopplevelser:

Munn, tunge, tenner, smake, tygge, svelge, hals, mage, føle

Hud, hender, fingre, føle (myk, hard, seig, glatt, rund, kald, varm etc.)

Øyne, se, farger, kontraster (rød, grønn, lys, mørk etc)

Nese, lukte (sterkt, ingenting, minner om andre lukter etc)

Ører, høre, lyd (knase, høy lyd, ingen lyd etc)

Grunnsmaker:

Salt, søtt, surt, bittert, umami. Se filmen om grunnsmakene. Oppfordre gjerne også foreldrene til å se filmene som ligger på nettsiden.

Tekst til nettside om de enkelte saperesamlingene

Meny 1

Det skal gjennomføres en saperesamling per uke i tre uker med spinat som fokusgrønnsak.
Les «generell informasjon om saperesamlinger» og se filmene om sapere og saperesamling før dere går i gang med første saperesamling.

Oppskrifter til saperesamlinger meny 1:

Uke 1: skyll spinatbladene før samlingen. Bruk helst babyspinat siden de skal spises rå, bladene er mindre og mer håndterlige for de små, bladene er dessuten litt mindre «trådete». Hvis dere ikke får tak i babyspinat kan dere bruke vanlig spinat.

Uke 2: spinat og yoghurtdip med frisk mynte. Barna tilbys smak av spinat både med og uten dip.

1,5 dl yoghurt naturell eller matlagingsyoghurt
½ -1 ts flytende honning eller sukker (bruk sukker dersom dere har med barn under 1 år)
7-8 blader finhakket frisk mynte (dersom det er vanskelig å få tak i frisk mynte kan frisk basilikum brukes, eventuelt fersk bladpersille.)
Smak til med ørlite salt og pepper

Uke 3: spinat med fetaost. Både hel blokk og ostebiter på glass kan brukes. Bruk fetaost lagd av kumelk (f.eks apetina eller dagros). Del fetaosten i små terninger. Hvis dere bruker fetaost på glass kan dere dele hver ferdigkuttede terning i to biter. La barna

forsøke å pakke inn en liten ostebit i et blad spinat. Barna kan smake både på rene spinatblader og blader med ost.

Allergitilpasning:

Dersom noen av barna ikke tåler melk så kan dere tilby alternativer til rømmedip, for eksempel rømmeerstatning av soya eller havre. Dropp fetaosten til den/de av barna som ikke tåler noe melkeprodukter. Oppfordre likevel den/de av barna det gjelder til å smake på spinatbladene.

Dersom det er barn som ikke tåler laktose kan laktosefri rømme og vanlig fetaost brukes.

Meny 2

Det skal gjennomføres en saperesamling per uke i tre uker med sellerirot som fokusgrønnsak.

Repeter gjerne «generell informasjon om saperesamlinger», eller se filmene om sapere og saperesamling igjen.

Oppskrifter til saperesamlingene i meny 2:

Uke 1: selleriroten behøver bare skrelles og kuttes i tynne staver, dette gjøres i samlingen etter at barna har fått sett, kjent og luktet på den hele/halve selleriroten.

Uke 2: Begynn med hel/halv sellerirot også i denne samlingen. Skrelles og kuttes i staver. Barna kan smake på sellerirot både med og uten dip.

Oppskrift til epledip:

½ beger lettrømme

¼-½ revet eple

½ ts sukker

½ ts sitronsaft

Uke 3: Bak staver av sellerirot i forkant av saperesamlingen. Ha med både rå og bakt sellerirot til samlingen. Barna kan oppfordres til å smake begge deler.

Bakt sellerirot:
Sellerirot (tilpass mengde etter antall barn, beregn 1-2 staver til hvert barn og 1-2 til den voksne)
2 ss olivenolje eller annen matolje
Et lite dryss salt
Skrell og skjær staver. Legg i ildfast form med litt olje i bunnen. Dryss over ørlite salt.
Bak i ovnen på 200 grader i cirka 15-20 minutter.

Meny 3

Det skal gjennomføres en saperesamling per uke i tre uker med fennikel som fokusgrønnsak.
Repeter gjerne «generell informasjon om saperesamlinger», eller se filmene om sapere og saperesamling igjen.

Oppskrifter til saperesamlinger meny 3:

Uke 1: skyll fennikelen før samling. Send rundt hele fennikelen så barna kan lukte og ta på før den skjæres i tynne strimler på langs som barna kan smake.

Uke 2: hel eller halv fennikel som skjæres i strimler på langs som kan spises som de er eller dyppes i en enkel rømmedip.

Oppskrift rømmedip:
½ boks lettrømme
1 ts sitronsaft
½ ts sukker
smak til med ørlite salt og pepper

Uke 3: ta med en hel/halv rå fennikel til samlingen, og litt bakt fennikel så barna kan se, lukte og smake både rå og bakt fennikel.

Oppskrift på bakt fennikel:

½ eller 1 fennikel (litt avhengig av størrelsen på barnegruppen, det skal bare være en liten smaksprøve på hver)

1-2 ss matolje

Et lite dryss salt og evt. ørlite pepper

Del fennikelen i båter og legg i ildfast form med litt olje i bunnen. Dryss på litt salt. Bakes i ovnen på 175 grader i 15-20 minutter.

Appendix 5

The information video manuscripts with illustrations

Manuskript til informasjonsfilmene

Video om saperemetoden og sansene våre (varighet 1 minutt og 21 sekunder)

Manuskript:

Ordet «Sapere» er latin og betyr «å kunne», «å smake», og «å kjenne».

Saperemetoden gir oss kunnskap om syn, lukt, smak, følelse og hørsel. Metoden går ut på å snakke med barna om sansene våre, fortelle om hvordan våre sanser fungerer og å bruke sansene aktivt i samlingsstunder med fokus på utvalgte matvarer.

Barna kan selv bestemme om de vil smake eller ikke. Hvis barnet har lyst til å smake på matvaren, men ikke vil svelge den er det lov å spytte den ut igjen. Ved å benytte Saperemetoden i barnehagen ønsker vi å oppmuntre til nysgjerrighet, initiativ og interesse for matvarer og måltider. Vi ønsker å lære barna matmot! Mot til å smake og mot til å spise nye matvarer.

Målet med Sapere er blant annet at barn skal få muligheten til:

-å bli kjent med sansene sine og sin egen smak

-å trene opp et språk for å uttrykke det de opplever

-å våge å prøve nye matvarer og matretter

-å ville spise mer variert

-å lære at mat er gøy!

Saperesamling

Saperesamling

SANSER: Saperesamlingen skal lære barnehagebarn å bli bevisst sine fem sanser og bruke disse i forhold til mat. Denne videoen gir et innblikk i hvordan en saperesamling foregår.

(Varighet 2 minutter og 53 sekunder)

Filmen er uten manuskript. Filmen viser en barnehagelærer som demonstrerer hvordan man kan gjennomføre en saperesamling i barnehagen i en gruppe med fire barn. Læreren har med seg hunden Sapere, boks med utstyr og månedens grønnsak som her er illustrert med brokkoli. Barnehagelæreren bruker både sansekortene og hunden, og viser og forklarer, sender grønnsaken rundt, lar barna se på, ta på, lukte på. Læreren spør barna om de kan kjenne noen lukt, beskrive fargen, hvordan grønnsaken er å ta på. Læreren spør deretter barna om de vil smake på brokkoli. De hører etter lyder når de tygger på grønnsaken. Ettåringer har lite ordforråd, barnehagelæreren beskrive med ord og ansiktsuttrykk og spør barna om de ser, lukter og føler det læreren gjør.

Video om de fem grunnsmakene (varighet 2 minutter og 33 sekunder)

Manuskript:

Smakssansen er den ene av våre to kjemiske sanser. Den andre er luktesansen. Begge disse sansene er viktige når det kommer til matopplevelser.

Inni munnen vår, særlig på tunga, har vi celler med spesielle oppgaver. Smakscellene, registrerer fem ulike smaker som vi kaller grunnsmaker: søtt, salt, surt, bittert og umami. Umami betyr rett og slett «det som smaker godt». Umami kan beskrives som kjøttaktig og fyldig, og er en smak mange liker. Bittert er nok den minst populære grunnsmaken.

Antallet smaksceller er ulikt fra person til person. Vi har derfor ulik følsomhet for grunnsmakene. Noen liker søtt ekstra godt, andre liker syrlig eller salt mat best.

For at vi skal bli sikre på vår egen smak og kunne uttrykke oss i forhold til forskjellige smaker, er det viktig å vite i hvilken mat vi finner de fem grunnsmakene: Den søte smaken kan vi finne i sukker, honning, tørket frukt og syltetøy. Salt smak finner vi i bordsalt, soyasaus, oliven og kapers. Den sure eller syrlige smaken kan vi finne i sitron, lime, eddik, rips, sylteagurk og grønne epler. Bittert er en grunnsmak vi finner i blant annet grapefrukt, ruccolasalat, kaffe og mørk sjokolade. Smaken som vi kaller umami finnes i soyasaus, parmesan, stekt sopp, soltørket tomat og buljong.

Å smake til maten er en teknikk som du kan få mye glede av å kunne. Det handler om å finne en balanse mellom de fem grunnsmakene. Salt forsterker matens egen smak, det søte holder det sure og bitre i sjakk og gjør smaken rundere. Motsatt kan du bruke syrlighet for å friske opp noe som er søtt eller fett.

La gjerne barna få smake på maten også før du justerer smakene, og spør de hva de tenker maten trenger mer eller mindre av.

Video om matneofobi (varighet 1 minutt og 25 sekunder)

Manuskript:

Neofobi er en betegnelse på frykt for alt som er nytt. Frykt for ny mat kalles matneofobi. Matneofobi er en naturlig del av barns utvikling og den er sterkest fra barnet er to til seks år. For veldig lenge siden var det bra at små barn var litt skeptiske til å putte fremmede ting i munnen. I dag vil vi gjerne at barna våre skal lære seg å like mange typer matvarer for å få et variert, sunt kosthold.

For at barn skal lære seg å like ny mat må vi tilby den samme matvaren flere ganger. Barn under to år må kanskje bare smake 4-5 ganger før de godtar den nye matvaren. Mens de litt eldre barna må gjerne prøve opptil 10-15 ganger, før de aksepterer og begynner å like den nye maten.

Ikke tving barnet til å spise, på lang sikt kan spiseplikt virke mot sin hensikt.

Oppmuntre barnet til å ta små smakebiter av ny mat og vis at du selv kan spise og like matvaren. Selv om barnet spytter ut maten kan dette bidra til at det etter hvert venner seg til smaken og begynner å like den. Ikke gi opp hvis du ikke får barnet til å like den nye maten på første forsøk, men prøv igjen etter noen dager.

Video om rollemodeller (varighet 1 minutt og 17 sekunder)

Som omsorgspersoner hjemme og i barnehagen har vi stor påvirkning på barna. Barn gjør ikke nødvendigvis bestandig det vi sier, men de gjør ofte det vi gjør. Det ligger derfor et stort ansvar på oss i forhold til hvordan vi opptrer når vi er sammen med barna. Forskning viser at det som best påvirker barna til å smake er at vi voksne går foran som gode rollemodeller og viser at vi spiser og liker maten.
Her er noen råd som du kan praktisere i måltidssituasjoner sammen med barna:
-Spis sammen med barna og bidra til et hyggelig måltid.
-Server ny mat med en positiv innstilling. Oppmuntre barna til å smake flere ganger hvis de ikke liker den nye maten med det samme.
-La barna spise mest mulig selv.
-Voksne bestemmer hva slags mat som serveres, men barnet bestemmer selv hvor mye det vil spise av maten.

-Ikke bruk mat eller drikke som belønning, straff eller trøst da det kan skape negative assosiasjoner til noen matvarer.

Appendix 6

Information letter to the kindergarten managers

Til styrer

Forespørsel om deltakelse i forskningsprosjekt

Bakgrunn og hensikt

Dette er en forespørsel om en, eller flere, avdeling(er) med 2016-barn i din barnehage kan bli med i en forskningsstudie som gjennomføres høsten og vinteren 2017-2018. Studien har til hensikt å måle effekten av et mat- og måltidstiltak i barnehagen. Studien vil i all hovedsak være nettbasert med informasjon og filmer på en egen nettside.

Forskningsstudien foregår i tilfeldig utvalgte småbarnsavdelinger/-grupper i fylkene Telemark, Oppland, Møre og Romsdal og Sør-Trøndelag. Dersom din barnehage samtykker til å delta i denne studien vil barnehagen bli tilfeldig trukket til å delta i en av tre grupper:

Tiltaksgruppe 1: Barnehageansatte lager og serverer mat i forhold til en gitt meny. Dere får oppskrifter som skal følges tre dager i uken. De andre to dagene i uken står dere fritt til å servere det dere pleier. Barnehagen vil få tilgang til oppskrifter og nødvendig informasjon på en egen nettside.

Tiltaksgruppe 2: Barnehageansatte lager og serverer mat i forhold til en gitt meny som beskrevet over. I tillegg blir tiltaksgruppe 2 bedt om å gjennomføre konkrete tiltak for å stimulere barna til et variert kosthold. Barnehagen og foreldre i denne gruppen vil få tilgang til oppskrifter og nødvendig informasjon på en egen nettside.

Kontrollgruppe: kontrollgruppen skal fortsette sin vanlige måltidspraksis og ikke gjøre noen endringer. Kontrollgruppen har en viktig funksjon fordi en eventuell effekt av tiltakene måles ved å sammenlikne resultatet fra tiltaksgruppene med kontrollgruppen.

Det er ikke mulig å påvirke hvilke barnehager som kommer i hvilken gruppe.

Forskningsresultatene vil gi økt kunnskap om barns kresenhet. Denne kunnskapen kan bidra til utvikling av nye mat- og kostholdstiltak i barnehager, og økt fokus på måltidspedagogikk i barnehagelærerutdanningen. Forskning viser at livsstilsvaner etableres tidlig. Barn spiser mange av måltidene sine i barnehagen, og barnehagen spiller dermed en sentral rolle i utviklingen av barns spise- og måltidsvaner. Derfor er det valgt et barnehageperspektiv for prosjektet.

Det er en forskergruppe ved Universitetet i Agder, Institutt for folkehelse, idrett og ernæring, som gjennomfører studien. Prosjektet ledes av professor Nina Øverby. Studien er meldt til Personvernombudet for forskning, Norsk samfunnsvitenskapelig datatjeneste (NSD) og er finansiert av Norske Kvinners Sanitetsforening og Universitetet i Agder.

Hva innebærer studien for barnehagen?

- Styrer vil bli bedt om å samtykke til deltagelse på vegne av barnehagen.
- Pedagogisk leder på avdelingen vil bli bedt om fylle ut et elektronisk spørreskjema to ganger. Hver gang tar ca. 15 min. Spørsmålene dreier seg om barnehagens mattilbud, pedagogens måltidspraksis i barnehagen, og eget forhold til ukjent mat.
- Det er viktig for studien at personalet deltar med en positiv innstilling.

Tillegg for barnehager i tiltaksgruppene:

Avdelingen vil tre dager i uka, over en ni ukers periode vinteren 2017/2018, ha *Barns matmot 2.0* som satsningsområde. Det innebærer for tiltaksgruppe 1 at alle barna på avdelingen serveres mat fra en ny lunsjmeny tre dager i uka. For tiltaksgruppe 2 vil det i tillegg være fokus på mat og språk i en samlingsstund en gang i uka. Personalet vil bli bedt om å følge utvalgte pedagogiske prinsipper under måltidene og i samlingsstunden, og barnas foreldre vil få informasjon om samlingsstunder og ukemenyer på en egen nettside.

Hva innebærer studien for deg som styrer?

- Du må sjekke med pedagogisk leder om avdelingen vil være med på studien og tilrettelegge for gjennomføring av prosjektet. Du må samtykke til deltakelse på vegne av barnehagen.
- Det er viktig for studien at du har en positiv innstilling til deltakelse og kan oppfordre de ansatte til å gjennomføre studien.
- Bidra til å skape forståelse og aksept for studien i barnehagens øvrige avdelinger.

Mulige fordeler og ulemper

- Studien vil ikke medføre noen ulemper for barna utover at de blir tilbudt smaksprøver på mat som kan være mer ukjent enn det som vanligvis serveres i barnehagen.
- Studien medfører heller ikke ulemper for deg eller personalet utover tiden det tar å sette i gang tiltaket, samt å fylle ut spørreskjemaene.
- *Kontrollbarnehagene* vil ved prosjektets slutt motta et gavekort på kjøkkenutstyr til en verdi á 2000 kroner.
- *Tiltaksbarnehagene* vil få et unikt kompetanseløft på mat og måltider. Dersom det er behov for oppgradering av barnehagens kjøkkenutstyr for å gjennomføre tiltaket kan det gis støtte til innkjøp av nødvendig utstyr.
- *Tiltaksbarnehagene* vil få et tilskudd på 150 kroner per barn som deltar i studien for å bidra til å dekke eventuelle merutgifter i forbindelse med innkjøp av matvarer til lunsjserveringen.
- *Barnehagene i tiltak 2* vil få tilsendt nødvendig utstyr for gjennomføring av samlingsstundene.
- Avdelingen/kjøkkenansvarlig må gjøre innkjøp og tilberede maten, og dette kan ta noe mer tid enn man vanligvis bruker på matlaging i barnehagen. Det er imidlertid lagt vekt på at rettene skal være enkle å tilberede.
- Avdelingen får tilgang til informasjon og oppskrifter på en egen nettside. Det er også mulighet for veiledning ved behov.

Hva skjer med informasjonen om deg?

Informasjonen som registreres om deltakerne skal kun brukes slik som beskrevet i hensikten med studien. Alle opplysningene vil bli behandlet uten navn og fødselsnummer eller andre direkte gjenkjennende opplysninger. En kode knytter deg til dine opplysninger gjennom en navneliste. Det er kun prosjektgruppen knyttet til studien som har adgang til navnelisten og som kan finne tilbake til deg, personalet eller barna. Det vil ikke være mulig å identifisere deg eller noen av de andre deltakerne i resultatene av studien, når disse publiseres. Datamaterialet anonymiseres ved prosjektslutt i 2021. Det innebærer at all kontaktinformasjon og koden som knytter denne informasjonen til dataene vil bli slettet. Dermed vil det ikke lenger være mulig å knytte datafilen til deltakerne.

Frivillig deltakelse i studien

Det er frivillig å delta i studien. Barnehagen kan når som helst og uten å oppgi noen grunn trekke seg fra studien, uten konsekvenser.

Vi setter stor pris på om du/dere vil delta i studien!

Vennlig hilsen
Eli Anne Myrvoll Blomkvist
Doktorgradsstipendiat
Universitetet i Agder

Nina C. Øverby
Professor
Universitetet i Agder

Elisabet R. Hillesund
Førsteamanuensis
Universitetet i Agder

Sissel H. Helland
Doktorgradsstipendiat
Universitetet i Agder

Letter to the parents from the pedagogical leaders

Brev til foreldre til barn født i 2016.

Kjære foreldre

Har du/dere og ditt barn lyst til å bli med på et forskningsprosjekt? Vi er en forskergruppe ved Universitetet i Agder som i løpet av høsten og vinteren skal gjennomføre en studie for å lære mer om små barns matvaner og deres forhold til ny mat. Din barnehage har takket ja til å delta i dette forskningsprosjektet. Det er kun barn født i 2016 som kan delta i studien.

Forskningsprosjektet skal foregå i småbarnsavdelinger og småbarnsgrupper i Telemark, Oppland, Sør-Trøndelag og Møre og Romsdal. Vi vil gjerne ha med så mange som mulig. Her finner du link til en nettside hvor du kan lese mer informasjon om prosjektet og hvor du kan registrere ditt barn til studien http://matmot.uia.no/registrer-barn. Ved å registrere ditt barn samtykker du til deltakelse i studien. Samtykke til studien forutsetter at du har lest den utfyllende informasjonen som du finner på denne nettsiden. Kun én av foreldrene/foresatte behøver å registrere barnet og seg selv til studien. Familien bestemmer selv hvem av foreldrene/foresatte som skal registrere seg og besvare spørreskjemaene. Vi håper du og ditt barn vil delta.

Vennlig hilsen
Eli Anne Myrvoll Blomkvist
Doktorgradsstipendiat
Universitetet i Agder

Appendix 8

Participant information and informed consent

Til foreldre

Forespørsel om deltakelse i forskningsprosjekt

Bakgrunn og hensikt

Styrer ved din barnehage har takket ja til at barnehagen deltar i forskningsstudien *Barns matmot 2.0*. Studien har til hensikt å måle effekten av et mat- og måltidstiltak i barnehagen. Dette er en forespørsel om du og ditt barn født i 2016 kan bli med i forskningsstudien.

Forskningsstudien foregår i tilfeldig utvalgte småbarnsavdelinger/grupper i Møre og Romsdal, Sør-Trøndelag, Telemark og Oppland. Barnehagene er inndelt i tre grupper, to ulike tiltaksgrupper og en kontrollgruppe. Alle tre gruppene er like viktige for studien da eventuelle effekter måles ved å sammenligne de tre gruppene med hverandre.

Ved å la barnet delta bidrar du til å skaffe ny kunnskap om kresenhet, samt kunnskap om små barns matvaner. Denne kunnskapen kan bidra til utvikling av nye mat- og kostholdstiltak i barnehager, og økt fokus på måltidspedagogikk i barnehagelærerutdanningen. Forskning viser at livsstilsvaner etableres tidlig. Barn spiser mange av måltidene sine i barnehagen, og barnehagen spiller dermed en sentral rolle i utviklingen av barns spise- og måltidsvaner. Derfor er det valgt et barnehageperspektiv for prosjektet.

Det er en forskergruppe ved Universitetet i Agder, Institutt for folkehelse, idrett og ernæring som gjennomfører studien. Prosjektet ledes av professor Nina Øverby. Studien er meldt til Personvernombudet for forskning, Norsk samfunnsvitenskapelig datatjeneste (NSD) og er finansiert av Universitet i Agder og Norske Kvinners Sanitetsforening.

Hva innebærer studien for deg og ditt barn?

- Du vil bli bedt om å fylle ut to spørreskjemaer høsten 2017 og våren 2018. Det ene spørreskjemaet omhandler dine og ditt barns matvaner, deres forhold til ny mat, og måltidspraksis i hjemmet. Det andre spørreskjemaet omhandler barnets utvikling.
- Du vil bli bedt om å fylle ut tilsvarende spørreskjemaer når barnet er 3 og 4 år gammelt. Dette fordi vi ønsker å undersøke eventuelle langtidseffekter av studien.
- *Tiltaksbarnehagene* vil servere barna på avdelingen mat fra en ny lunsjmeny tre dager i uka i totalt ni uker. Barnet kan bli tilbudt smaksprøver på mat eller bli servert råvarer som er mer ukjent enn det som vanligvis serveres i barnehagen, men det er alltid frivillig for barnet å smake.
- *Kontrollbarnehagene* kommer ikke til å endre sin måltidspraksis de tre månedene prosjektet varer.

Det kan komme fremtidige forespørsler om å delta i oppfølgingsundersøkelser.

Mulige fordeler og ulemper

- Studien vil ikke medføre ulemper for deg utover tiden det tar å fylle ut spørreskjemaene.
- *Tiltaksbarnehagene* vil få et kompetanseløft på mat og måltider.
- *Kontrollbarnehagene* vil ved prosjektets slutt, etter at alle spørreskjema er samlet inn våren 2018, motta et gavekort på kjøkkenutstyr til en verdi á 2000 kroner.

Hva skjer med informasjonen om deg og barnet?

Informasjonen som registreres om deg skal kun brukes slik som beskrevet i hensikten med studien. Alle opplysningene vil bli behandlet uten navn og fødselsnummer eller andre direkte gjenkjennende opplysninger. En kode knytter deg og ditt barn til deres opplysninger gjennom en navneliste. Det er kun prosjektgruppen knyttet til studien som har adgang til navnelisten, og som kan finne tilbake til deg eller barnet ditt. Det vil ikke være mulig å identifisere hverken deg eller barnet i resultatene av studien, når disse publiseres. Ved prosjektslutt, i 2021, vil datamaterialet anonymiseres. Det innebærer at all kontaktinformasjon og koden som knytter denne informasjonen til dataene vil bli slettet. Dermed vil det ikke lenger være mulig å knytte datafilen til deltakerne.

Frivillig deltakelse

Det er frivillig å delta i studien. Du kan når som helst og uten å oppgi noen grunn trekke deg fra studien, uten konsekvenser for deg eller ditt barn.

Vi setter stor pris på om du/dere vil delta i studien!

Vennlig hilsen
Eli Anne Myrvoll Blomkvist
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Universitetet i Agder

Baseline questionnaire (Parents)

Tusen takk for at du tar deg tid til å delta i forskningsstudien Barns matmot 2.0.

Vi ønsker kun én besvarelse per barn. Familien bestemmer selv hvem av foreldrene/foresatte som besvarer spørreskjemaet. Den som fyller ut skjemaet bes gjøre det ut fra det som stemmer for seg selv og barnet født i 2016.

Spørreskjemaet består av to deler. Første del dreier seg i hovedsak om deg og dine kostholdsvaner, mens du i andre del får spørsmål om barnets mat- og spisevaner. Det er spørsmål om barnets fødselsvekt og vekt og høyde ved 12-måneders alder, så det er lurt å ha barnets helsekort lett tilgjengelig. Hele spørreskjemaet vil ta cirka 15-20 minutter å fylle ut. Det kan være lurt at du setter deg et sted hvor du kan sitte uforstyrret. Les spørsmålene nøye og svar så godt du kan.

TUSEN TAKK FOR AT DU DELTAR!
Vennlig hilsen
Eli Anne Myrvoll Blomkvist
Doktorgradsstipendiat
Universitetet i Agder

Først noen spørsmål om deg selv:

Hvilket kjønn er du?
(1)   ❑ Mann
(2)   ❑ Kvinne

Hvilken relasjon har du til barnet som deltar i undersøkelsen?

(1) ❑ Barnets mor

(2) ❑ Barnets far

(3) ❑ Annen foresatt

Hva er din alder?
Skriv inn alder i hele år, f.eks 32

___

Hvor høy er du?
Oppgi høyde i centimeter, for eksempel 168

___

Hva veier du?
Oppgi vekt i kilo, for eksempel 70

___

Etnisk bakgrunn

	Ja	Nei	Vet ikke
Ble barnets mor født i Norge?	(1) ❑	(2) ❑	(3) ❑
Ble barnets far født i Norge?	(1) ❑	(2) ❑	(3) ❑
Ble barnet som deltar i undersøkelsen født i Norge?	(1) ❑	(2) ❑	(3) ❑

Sivil status

(1) ❑ Enslig

(2) ❑ Gift

(3) ❑ Samboer

(4) ❑ Separert/skilt

(5) ❑ Annet

Bor barnets foreldre/foresatte sammen?

(1) ❑ Ja

(2) ❑ Nei

Hvor mange personer bor det i husholdningen din?

_____

Hvor mange av personene som bor i husholdningen er barn? Inkludert barnet som er med i undersøkelsen.

_____

Hvilken utdannelse har barnets mor?
Marker høyest fullførte utdannelse

(1) ❑ Mindre enn 9 eller 10 års grunnskole

(3) ❑ Grunnskole

(4) ❑ Videregående skole inkludert gymnas/yrkesskole/fagbrev

(5) ❑ Universitet eller høyskole inntil fire år

(6) ❑ Universitet eller høyskole mer enn fire år

Hvilken utdannelse har barnets far?
Marker høyest fullførte utdannelse

(1) ❑ Mindre enn 9 eller 10 års grunnskole

(3) ❑ Grunnskole

(4) ❑ Videregående skole inkludert gymnas/yrkesskole/fagbrev

(5) ❑ Universitet eller høyskole inntil fire år

(6) ❑ Universitet eller høyskole mer enn fire år

Hva er din hovedaktivitet nå for tiden?
Sett ett kryss

(1) ❑ Arbeid heltid

(2) ❑ Arbeid deltid

(3) ❑ Hjemmeværende

(4) ❑ Sykmeldt

(5) ❑ Permisjon

(6) ❑ Uføretrygdet

(7) ❑ Under attføring/rehabilitering/arbeidsavklaring

(8) ❑ Student

(9) ❑ Arbeidsledig

(10) ❑ Annet

Nå kommer noen spørsmål om dine matvaner og matinntak.

Hvor ofte spiser du følgende frukt og bær

	Aldri	Sjeldnere enn 1 gang i måneden	1-3 ganger i måneden	1-2 ganger per uke	3-4 ganger per uke	5-6 ganger per uke	1 gang per dag	Flere ganger per dag
Bær (friske/frosne)	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Appelsin, klementin o.l.	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Banan	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Eple, pære	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Druer	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Annen frukt (kiwi, melon etc)	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Hermetisk frukt	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Rosiner	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Annen tørket frukt	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Smoothie av frukt og/eller bær	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Usaltede nøtter/mandler	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑

Hvor ofte spiser du følgende grønnsaker?

	Aldri	Sjeldnere enn en gang i måneden	1-3 ganger i måneden	1-2 ganger per uke	3-4 ganger per uke	5-6 ganger per uke	1 gang per dag	2 ganger per dag	3 eller flere ganger per dag
Gulrot	(3) ❑	(10) ❑	(9) ❑	(4) ❑	(5) ❑	(11) ❑	(6) ❑	(7) ❑	(8) ❑

	Aldri	Sjeldnere enn en gang i måneden	1-3 ganger i måneden	1-2 ganger per uke	3-4 ganger per uke	5-6 ganger per uke	1 gang per dag	2 ganger per dag	3 eller flere ganger per dag
Kålrot	(3) ❑	(10) ❑	(9) ❑	(4) ❑	(5) ❑	(11) ❑	(6) ❑	(7) ❑	(8) ❑
Blomkål, brokkoli	(3) ❑	(10) ❑	(9) ❑	(4) ❑	(5) ❑	(11) ❑	(6) ❑	(7) ❑	(8) ❑
Frossen grønnsaksblanding	(3) ❑	(10) ❑	(9) ❑	(4) ❑	(5) ❑	(11) ❑	(6) ❑	(7) ❑	(8) ❑
Råkost, bladgrønnsaker (salat)	(3) ❑	(10) ❑	(9) ❑	(4) ❑	(5) ❑	(11) ❑	(6) ❑	(7) ❑	(8) ❑
Spinat	(3) ❑	(10) ❑	(9) ❑	(4) ❑	(5) ❑	(11) ❑	(6) ❑	(7) ❑	(8) ❑
Løk, purreløk	(3) ❑	(10) ❑	(9) ❑	(4) ❑	(5) ❑	(11) ❑	(6) ❑	(7) ❑	(8) ❑
Agurk	(3) ❑	(10) ❑	(9) ❑	(4) ❑	(5) ❑	(11) ❑	(6) ❑	(7) ❑	(8) ❑
Tomat	(3) ❑	(10) ❑	(9) ❑	(4) ❑	(5) ❑	(11) ❑	(6) ❑	(7) ❑	(8) ❑
Erter, bønner og linser	(3) ❑	(10) ❑	(9) ❑	(4) ❑	(5) ❑	(11) ❑	(6) ❑	(7) ❑	(8) ❑
Mais	(3) ❑	(10) ❑	(9) ❑	(4) ❑	(5) ❑	(11) ❑	(6) ❑	(7) ❑	(8) ❑
Paprika	(3) ❑	(10) ❑	(9) ❑	(4) ❑	(5) ❑	(11) ❑	(6) ❑	(7) ❑	(8) ❑
Fennikel	(3) ❑	(10) ❑	(9) ❑	(4) ❑	(5) ❑	(11) ❑	(6) ❑	(7) ❑	(8) ❑
Sellerirot	(3) ❑	(10) ❑	(9) ❑	(4) ❑	(5) ❑	(11) ❑	(6) ❑	(7) ❑	(8) ❑
Andre grønnsaker	(3) ❑	(10) ❑	(9) ❑	(4) ❑	(5) ❑	(11) ❑	(6) ❑	(7) ❑	(8) ❑

I hvilken grad er du enig i følgende påstander?
Svarkategorier fra 1 = helt uenig til 7 = helt enig

	Helt uenig	Nokså uenig	Litt uenig	Verken enig eller uenig	Litt enig	Nokså enig	Helt enig
Jeg prøver stadig ny og ulik type mat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Jeg stoler ikke på ukjent mat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Hvis jeg ikke kjenner til hva som er i maten, vil jeg ikke smake	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Jeg liker mat fra ulike land	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Etnisk mat ser for merkelig ut til å spises	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑

	Helt uenig	Nokså uenig	Litt uenig	Verken enig eller uenig	Litt enig	Nokså enig	Helt enig
I middagsselskaper prøver jeg gjerne ny mat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Jeg er redd for å spise ting jeg ikke har spist før	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Jeg er veldig kresen på hva slags mat jeg vil spise	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Jeg spiser nesten all slags mat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Jeg liker å prøve nye etniske restauranter	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑

Den neste delen dreier seg om barnet som deltar i undersøkelsen.
Du vil få spørsmål om barnets mat, drikke og spisevaner, men først noen
bakgrunnsspørsmål om barnet:

Hvilket kjønn er barnet som er med i undersøkelsen?
(1)   ❑ Jente
(2)   ❑ Gutt

Hva er alderen til barnet som er med i undersøkelsen?
Skriv inn alder i nærmeste antall måneder, f.eks 18
__

Hva var barnets fødselsvekt?
Skriv inn tall i gram, for eksempel 3720
____

Hva var barnets lengde ved fødsel?
Skriv inn tall i centimeter, for eksempel 49
__

Har barnet vært til 12-månederskontroll ved helsestasjonen?

(1) ❑ Ja

(2) ❑ Nei

Hva var barnets vekt ved måling på 12-månederskontrollen?
Skriv inn vekt i kilo med en desimal, for eksempel 9,5 eller 13,0

_____

Hva var barnets lengde ved måling på 12-månederskontrollen?
Skriv inn lengde i centimeter for eksempel 80 eller 85,5

_____

Hvis barnet ikke har vært til 12-månederskontroll ennå, hvor gammelt var barnet ved siste måling av vekt og lengde?
Fyll inn tall i måneder, for eksempel 9 eller 10,5

_____

Hva var barnets vekt ved siste måling?
Skriv inn tall i kilo med en desimal, for eksempel 7,5 eller 8,0

_____

Spørsmål om barnets mat- og drikkevarer

Får barnet morsmelk nå?
Sett ett kryss

(1) ❑ Ja

(2) ❑ Nei, men barnet har fått morsmelk tidligere

(3) ❑ Nei, barnet har aldri fått morsmelk

Hvor mange ganger i døgnet får barnet morsmelk nå?

(1) ❑ 1 gang

(2) ❑ 2-3 ganger

(3) ❑ 4-5 ganger

(4) ❑ 6-7 ganger

(5) ❑ 8-9 ganger

(6) ❑ 10 ganger eller flere

Hvor gammelt var barnet da det sluttet å få morsmelk?

(1) ❑ 1 uke

(2) ❑ 2 uker

(3) ❑ 3-4 uker

(4) ❑ 2 måneder

(5) ❑ 3 måneder

(6) ❑ 4 måneder

(7) ❑ 5 måneder

(8) ❑ 6 måneder

(9) ❑ 7 måneder

(10) ❑ 8 måneder

(11) ❑ 9 måneder

(12) ❑ 10 måneder

(13) ❑ 11 måneder

(14) ❑ 12 måneder

(15) ❑ Eldre enn 12 måneder

Hvor gammelt var barnet da det fikk følgende matvarer for første gang?

	Har ikke fått	0-2 måneder	3 måneder	4 måneder	5 måneder	6 måneder	7 måneder	8 måneder	9 måneder	10 måneder	11 måneder	12 måneder	Eldre enn 12 måneder	Vet ikke
Industriframstilt grøt/velling (eks. Nestlé, Hipp)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑	(10) ❑	(11) ❑	(12) ❑	(13) ❑	(14) ❑
Hjemmelaget grøt av mel/gryn/ris/kavring	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑	(10) ❑	(11) ❑	(12) ❑	(13) ❑	(14) ❑
Industriframstilt middag på glass (eks. Nestlé, Hipp)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑	(10) ❑	(11) ❑	(12) ❑	(13) ❑	(14) ❑

	Har ikke fått	0-2 måneder	3 måneder	4 måneder	5 måneder	6 måneder	7 måneder	8 måneder	9 måneder	10 måneder	11 måneder	12 måneder	Eldre enn 12 måneder	Vet ikke
Hjemmelaget middag (mos, puré eller biter)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑	(10) ❑	(11) ❑	(12) ❑	(13) ❑	(14) ❑
Industriframstilt frukt-/bærmos/smoothie fra glass, beger eller klemmepose	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑	(10) ❑	(11) ❑	(12) ❑	(13) ❑	(14) ❑
Hjemmelaget frukt-/bærmos/smoothie	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑	(10) ❑	(11) ❑	(12) ❑	(13) ❑	(14) ❑
Yoghurt	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑	(10) ❑	(11) ❑	(12) ❑	(13) ❑	(14) ❑
Brødmat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑	(10) ❑	(11) ❑	(12) ❑	(13) ❑	(14) ❑
Morsmelkerstatning som drikke	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑	(10) ❑	(11) ❑	(12) ❑	(13) ❑	(14) ❑
Kumelk som drikke	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑	(10) ❑	(11) ❑	(12) ❑	(13) ❑	(14) ❑
Vann	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑	(10) ❑	(11) ❑	(12) ❑	(13) ❑	(14) ❑
Fruktjuice	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑	(10) ❑	(11) ❑	(12) ❑	(13) ❑	(14) ❑

Hvor ofte pleier barnet å spise følgende måltider i løpet av en uke?

	En gang i blant	1 gang per uke	2 ganger per uke	3 ganger per uke	4 ganger per uke	5 ganger per uke	6 ganger per uke	Hver dag	Ikke aktuelt/spiser ikke denne typen måltid
Frokost	(1) ❑	(9) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑
Lunsj/formiddagsmat	(1) ❑	(9) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑
Ettermiddagsmat (mellommåltid mellom lunsj og middag)	(1) ❑	(9) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑
Middag	(1) ❑	(9) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑

	En gang i blant	1 gang per uke	2 ganger per uke	3 ganger per uke	4 ganger per uke	5 ganger per uke	6 ganger per uke	Hver dag	Ikke aktuelt/s piser ikke denne typen måltid
Kveldsmat	(1) ❑	(9) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑
Andre måltider/mellommåltider	(1) ❑	(9) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑

Pleier barnet å bli matet (en voksen holder skjeen eller deler opp maten og gir den bit for bit) eller spiser det selv?
Dersom barnet både spiser litt selv og blir noe matet i ett og samme måltid, velg det svaralternativet som gjelder for størsteparten av måltidet.

(1) ❑ Spiser selv
(2) ❑ Blir matet

Hvor ofte spiser barnet følgende måltider sammen med familien?

	Aldri/sjeldnere enn hver uke	1-3 ganger per uke	4-6 ganger per uke	Hver dag	Ikke aktuelt
Frokost	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Lunsj/formiddagsmat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Ettermiddagsmat (mellommåltid mellom lunsj og middag)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Middag	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Kveldsmat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Andre måltider/mellommåltider	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

Hvor ofte drikker barnet de nevnte drikkene?

	Aldri	Sjeldnere enn en gang per uke	1 gang per uke	2-3 ganger per uke	4-6 ganger per uke	1 gang per dag	Flere ganger daglig
Melk (usøtet melk f.eks lettmelk eller skummet kulturmelk)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Søtede melkedrikker (f.eks. biola eller sjokomelk)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Fruktjuice (uten tilsatt sukker)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Vann	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Drikke tilsatt sukker (saft, brus, nektar, iste, leskedrikk)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Drikke med kunstig søtning (lettsaft, lettbrus etc)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Smoothie laget av frukt og/eller bær	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑

Hvor ofte spiser barnet følgende frukt og bær?

	Aldri	Sjeldnere enn 1 gang i måneden	1-3 ganger i måneden	1-2 ganger per uke	3-4 ganger per uke	5-6 ganger per uke	1 gang per dag	2 ganger per dag	3 eller flere ganger per dag
Bær (friske/frosne)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Appelsin, klementin o.l	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Banan	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Eple, pære	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Druer	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Annen frukt (kiwi, melon, ananas etc)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Hermetisk frukt	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Rosiner	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Annen tørket frukt	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Usaltede nøtter/mandler	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑

Hvor ofte spiser barnet følgende grønnsaker?

	Aldri	Sjeldnere enn 1 gang i måneden	1-3 ganger i måneden	1-2 ganger per uke	3-4 ganger per uke	5-6 ganger per uke	1 gang per dag	2 ganger per dag	3 eller flere ganger per dag
Gulrot	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Kålrot	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Blomkål, brokkoli	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Frossen grønnsaksblanding	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Råkost, bladgrønnsaker (salat)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Løk, purreløk	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Spinat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Agurk	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Tomat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Erter, bønner, linser	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Mais	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Paprika	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Fennikel	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Sellerirot	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Andre grønnsaker	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑

Hvor ofte spiser barnet poteter, pasta og ris?

	Aldri	Sjeldnere enn 1 gang i måneden	1-3 ganger i måneden	1-2 ganger per uke	3-4 ganger per uke	5-6 ganger per uke	1 gang per dag	Flere ganger per dag
Poteter (kokt, most)	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Potetmos av pulver	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Pommes frites, stekte poteter	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑

	Aldri	Sjeldnere enn 1 gang i måneden	1-3 ganger i måneden	1-2 ganger per uke	3-4 ganger per uke	5-6 ganger per uke	1 gang per dag	Flere ganger per dag
Pasta (spaghetti, makaroni etc)	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Ris	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Couscous, bulgur	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
"Byggris"	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑

Hvor ofte spiser barnet følgende matretter?
(For eksempel til middag eller som varm lunsj)

	Aldri	Sjeldnere enn 1 gang i måneden	1-3 ganger i måneden	1-2 ganger per uke	3-4 ganger per uke	5-6 ganger per uke	Hver dag
Rent rødt kjøtt (f.eks. kjøttstykker av okse, svin eller lam)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Rent hvitt kjøtt (f.eks. filet eller lårkjøtt av kylling eller kalkun)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Oppblandet kjøtt (hamburger, karbonade, kjøttkaker, kjøttdeig)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Pølser	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Pizza	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Pannekaker	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Mager fisk (torsk, hyse, sei etc)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Fet fisk (laks, ørret, makrell, sild, kveite etc. Ikke som pålegg, spørsmål om det kommer senere)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Oppblandet fisk (fiskekaker, fiskepinner, fiskepudding, fiskegrateng)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑

	Aldri	Sjeldnere enn 1 gang i måneden	1-3 ganger i måneden	1-2 ganger per uke	3-4 ganger per uke	5-6 ganger per uke	Hver dag
Annen sjømat (eks. skalldyr)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Hjemmelagd suppe	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Hjemmelagde gryteretter (lapskaus, frikasse, curry)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Halvfabrikata (for eksempel suppe eller gryteretter fra pose)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Ferdigretter (eks. middager fra Findus eller Fjordland)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Industriframstilte middagsretter på glass (eks. Nestlé, Hipp)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑

Hvilken type fett bruker familien vanligvis til matlaging/steking?
Hvis du bruker flere typer, sett kryss for den du bruker oftest.

(1) ❑ Meierismør
(2) ❑ Melange
(3) ❑ Bremykt
(4) ❑ Myk plantemargarin som Vita og Soft
(5) ❑ Flytende margarin
(6) ❑ Olje (for eksempel oliven-, soya- eller rapsolje)
(7) ❑ Kokosfett/kokosolje
(8) ❑ Rapskokos
(11) ❑ Annet
(10) ❑ Bruker ikke fett til matlaging eller steking

Hvor ofte spiser barnet brød, grøt og frokostblandinger?

	Aldri	Sjeldnere enn 1 gang i måneden	1-3 ganger i måneden	1-2 ganger per uke	3-4 ganger per uke	5-6 ganger per uke	1 gang per dag	Flere ganger per dag
Fint brød/rundstykker, loff	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑

	Aldri	Sjeldnere enn 1 gang i måneden	1-3 ganger i måneden	1-2 ganger per uke	3-4 ganger per uke	5-6 ganger per uke	1 gang per dag	Flere ganger per dag
Grovt brød/rundstykker (minst 50 prosent sammalt mel, hele korn og kjerner)	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Grove knekkebrød eller kavringer	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Fine knekkebrød eller kavringer	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Havregrøt	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Industrifremstilt barnegrøt (eks. Nestle, Hipp)	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Musli/havregryn uten tilsatt sukker	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Andre frokostblandinger (Corn flakes, puffet ris etc)	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑

Hva smører du vanligvis på brødet til barnet?
Hvis du bruker flere typer, sett kryss for det du bruker oftest

(1) ❑ Bruker ikke smør/margarin

(2) ❑ Meierismør

(3) ❑ Bremykt

(4) ❑ Brelett

(5) ❑ Melange

(6) ❑ Soft Flora

(7) ❑ Vita margarin

(8) ❑ Lettmargarin (soft light, vita lett)

(9) ❑ Rapskokos

(10) ❑ Annen type margarin

Hva pleier barnet å spise av pålegg?

	Aldri	Sjeldnere enn 1 gang i måneden	1-3 ganger i måneden	1-2 ganger per uke	3-4 ganger per uke	5-6 ganger per uke	1 gang per dag	Flere ganger per dag
Brunost og vanlig prim	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Prim tilsatt jern (Sprett, Herkules)	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Hvitoster (Jarlsberg, Norvegia, Gouda etc.)	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Smelteoster (baconost, rekeost, skinkeost etc.)	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Leverpostei	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Servelat, skinke, salami eller annet kjøttpålegg	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Makrell i tomat, røkt laks eller annen fisk som pålegg	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Kaviar	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Egg	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Syltetøy eller honning	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Sjokoladepålegg, nøttepålegg, HaPå	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Peanøttsmør	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Majonessalater (f.eks. italiensk salat, rekesalat)	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Frukt som pålegg	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Grønnsaker som pålegg	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑

Hvor ofte spiser barnet kjeks, snacks og søtsaker?

	Aldri	Sjeldnere enn 1 gang i måneden	1-3 ganger i måneden	1-2 ganger per uke	3-4 ganger per uke	5-6 ganger per uke	1 gang per dag	Flere ganger per dag
Salte kjeks	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Søte kjeks, cookies	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑

	Aldri	Sjeldnere enn 1 gang i måneden	1-3 ganger i måneden	1-2 ganger per uke	3-4 ganger per uke	5-6 ganger per uke	1 gang per dag	Flere ganger per dag
Søtt bakverk (kaker, boller etc.)	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Salt snacks (chips, ostepop, popcorn etc.)	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Salte nøtter	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Søtsaker (godterier, sjokolade etc.)	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Iskrem, saftis, sorbet	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑

Er det noen matvarer det kunne vært aktuelt å gi barnet, men som du unngår å gi fordi du er redd barnet kan reagere med allergi/intoleranse?

(1) ❑ Ja

(2) ❑ Nei

Har barnet fått påvist allergi eller intoleranse?

(1) ❑ Ja

(2) ❑ Nei

Har barnet problemer i forhold til spising/mat?
Her kan du sette flere kryss

(1) ❑ Nei, har ikke noen problemer

(2) ❑ Ja, barnet har dårlig matlyst eller er småspist

(3) ❑ Ja, vanskelig med tilvenning til med fast føde/vanlig mat

(4) ❑ Ja, allergi/intoleranse mot enkelte matvarer

(5) ❑ Ja, andre problemer

Hvis barnet har andre problemer med mat/spising enn det som var oppgitt, vennligst spesifiser her:

_____

_____

_____

_____

_____

_____

Hvor ofte får barnet tilskudd av tran, vitaminer og mineraler nå for tiden?

	Aldri	Sjeldnere enn ukentlig	1-3 ganger per uke	4-6 ganger per uke	1 gang per dag	2 eller flere ganger per dag
Multivitaminer, flytende multivitamintilskudd (sanasol, multi, biovit), vitaminbjørner	(1) ☐	(2) ☐	(3) ☐	(4) ☐	(5) ☐	(6) ☐
Vitamin D-dråper eller andre D-vitamintilskudd	(1) ☐	(2) ☐	(3) ☐	(4) ☐	(5) ☐	(6) ☐
Tran/fiskeolje, flytende, kapsler eller tyggetabletter	(1) ☐	(2) ☐	(3) ☐	(4) ☐	(5) ☐	(6) ☐
Annet kosttilskudd	(1) ☐	(2) ☐	(3) ☐	(4) ☐	(5) ☐	(6) ☐

Dersom barnet får andre kosttilskudd enn det som er oppgitt, skriv type(r) og hvor ofte barnet får det:

_____

_____

_____

_____

_____

_____

Hvilke grønnsaker liker barnet?

	Liker godt	Liker litt	Verken liker eller misliker	Liker ikke noe særlig	Liker ikke i det hele tatt	Har aldri smakt
Grønne bønner/aspargesbønner	(1) ☐	(2) ☐	(3) ☐	(4) ☐	(5) ☐	(6) ☐
Brokkoli	(1) ☐	(2) ☐	(3) ☐	(4) ☐	(5) ☐	(6) ☐
Spinat	(1) ☐	(2) ☐	(3) ☐	(4) ☐	(5) ☐	(6) ☐

	Liker godt	Liker litt	Verken liker eller misliker	Liker ikke noe særlig	Liker ikke i det hele tatt	Har aldri smakt
Gulrot	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Gresskar	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Søtpotet	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Mais	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Grønne erter	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Poteter (kokt, most, stekt)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Squash	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Kål	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Løk, purreløk	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Blomkål	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Rosenkål	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Salat og andre bladgrønnsaker	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Sellerirot	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Fennikel	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Tomat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Agurk	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Sopp	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Chili	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Aubergine	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Hvilke frukter liker barnet?

	Liker godt	Liker litt	Verken liker eller misliker	Liker ikke noe særlig	Liker ikke i det hele tatt	Har aldri smakt
Avokado	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Eple	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Pære	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Fersken, nektarin	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

	Liker godt	Liker litt	Verken liker eller misliker	Liker ikke noe særlig	Liker ikke i det hele tatt	Har aldri smakt
Banan	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Appelsiner, klementiner	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Melon	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Plommer	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Druer	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Mango	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Papaya	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Ananas	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Kiwi	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Rosiner	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Hermetisk frukt	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Bær	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Takk for at du har svart så langt! Dine svar er viktige for studien.
De neste spørsmålene handler om måltidssituasjoner og hvordan barnet forholder seg til ny mat.

"Det er lett å få barnet mitt til å spise, sammenlignet med andre barn på samme alder."
Hvor enig er du i dette utsagnet?

(1) ❑ Svært enig
(2) ❑ Enig
(3) ❑ Verken enig eller uenig
(4) ❑ Uenig
(5) ❑ Svært uenig

Hvor ofte avviser barnet ditt mat det får servert/tilbudt?

(1) ❑ Svært ofte
(2) ❑ Ofte
(3) ❑ Noen ganger
(4) ❑ Nesten aldri

(5) ☐ Aldri

Synes du barnet ditt er kresen eller sær i matveien?

(1) ☐ Svært kresen/sær

(2) ☐ Litt kresen/sær

(3) ☐ Ikke kresen/sær

(4) ☐ Usikker

De neste spørsmålene handler om hvordan barnet ditt reagerer på ny eller ukjent mat.

Hvor villig er barnet ditt til å spise nye matvarer det ikke har smakt før?

(1) ☐ Svært villig

(2) ☐ Villig

(3) ☐ Verken eller

(4) ☐ Motvillig

(5) ☐ Svært motvillig

Hvor enig eller uenig er du i påstandene under?

	Helt uenig	Nokså uenig	Litt uenig	Verken enig eller uenig	Litt enig	Nokså enig	Helt enig
Barnet mitt prøver stadig ny og ulik type mat	(1) ☐	(2) ☐	(3) ☐	(4) ☐	(5) ☐	(6) ☐	(7) ☐
Barnet mitt stoler ikke på ukjent mat	(1) ☐	(2) ☐	(3) ☐	(4) ☐	(5) ☐	(6) ☐	(7) ☐
Hvis barnet mitt ikke vet hva som er i maten vil han/hun ikke smake	(1) ☐	(2) ☐	(3) ☐	(4) ☐	(5) ☐	(6) ☐	(7) ☐
Barnet mitt er redd for å spise ting han/hun ikke har spist før	(1) ☐	(2) ☐	(3) ☐	(4) ☐	(5) ☐	(6) ☐	(7) ☐
Barnet mitt er veldig kresen på hva slags mat han/hun vil spise	(1) ☐	(2) ☐	(3) ☐	(4) ☐	(5) ☐	(6) ☐	(7) ☐

	Helt uenig	Nokså uenig	Litt uenig	Verken enig eller uenig	Litt enig	Nokså enig	Helt enig
Barnet mitt spiser nesten all slags mat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑

Hvor ofte blir barnet ditt tilbudt nye/ukjente matvarer?

(1) ❑ Veldig ofte

(2) ❑ Ofte

(3) ❑ Noen ganger

(4) ❑ Sjelden

(5) ❑ Aldri

Hvor mange ganger tilbyr du barnet ditt en matvare før du avgjør om barnet liker matvaren eller ikke?

(1) ❑ Én gang

(2) ❑ To ganger

(3) ❑ 3-5 ganger

(4) ❑ 6-10 ganger

(5) ❑ 11 ganger eller flere

Hvordan reagerer du hvis barnet avviser en ny matvare som han/hun ikke har smakt før?

	Aldri	Sjelden	Noen ganger	Ofte
Antar at barnet ikke liker matvaren og slutter å tilby matvaren	(1) ❑	(2) ❑	(3) ❑	(4) ❑
Neste gang vil jeg blande matvaren i annen mat for å "gjemme" den	(1) ❑	(2) ❑	(3) ❑	(4) ❑
Jeg tilbyr matvaren igjen, men da sammen med andre matvarer som barnet mitt liker	(1) ❑	(2) ❑	(3) ❑	(4) ❑

Hender det at barnet ditt avviser mat som han/hun vanligvis spiser?

(1) ❑ Svært ofte

(2) ❑ Ofte

(3) ❑ Noen ganger

(4) ❑ Nesten aldri

(5) ❑ Aldri

Hvis barnet ditt avviser mat som han/hun vanligvis spiser, vil du...?
Sett et kryss for hver påstand.

	Aldri	Sjelden	Noen ganger	Ofte	Som oftest
insistere på at barnet skal spise maten	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
tilby melk i stedet	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
tilby en annen matvare som han/hun liker	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
oppmuntre barnet til å spise ved å gjøre måltidet til en lek, for eksempel ved å late som om skjeen er et fly	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
oppmuntre barnet til å spise ved å tilby en spiselig belønning, for eksempel dessert	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
oppmuntre barnet til å spise ved å tilby en belønning som ikke er mat, for eksempel en leke eller å få se på tv	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
la være å tilby mer mat fram til neste vanlige måltid, for eksempel kveldsmat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
godta at barnet kanskje ikke er sulten og ta vekk maten	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
straffe barnet	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

Hvem bestemmer hva barnet skal spise
-du (eventuelt en annen voksen) eller barnet?

(1) ❑ Kun du

(2) ❑ For det meste du

(3) ❑ Både du og barnet

(4) ❑ For det meste barnet

(5) ❑ Kun barnet

Hvem bestemmer hvor mye mat barnet skal spise
-du (eventuelt en annen voksen) eller barnet?

(1) ❑ Kun du

(2) ❑ For det meste du

(3) ❑ Både du og barnet

(4) ❑ For det meste barnet

(5) ❑ Kun barnet

Du vil nå bli bedt om å ta stilling til påstander knyttet til barnets matvaner.
Disse spørsmålene er hentet fra et spørreskjema som er beregnet for både små og større barn. Det kan derfor være at du synes enkelte av spørsmålene er lite relevante. Svar likevel så godt du kan.
Kryss av på det alternativet som passer best for deg og barnet ditt.

	Aldri	Sjelden	Noen ganger	Som oftest	Alltid
Lar du barnet ditt spise hva han/hun vil?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Tenk deg et middagsmåltid: lar du barnet velge den maten han/hun vil blant matvarene som serveres til middag?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Når barnet ditt blir masete, er det første du gjør å gi han/henne noe å spise eller	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

	Aldri	Sjelden	Noen ganger	Som oftest	Alltid
drikke selv om du ikke tror at han/hun er sulten?					
Gir du barnet ditt noe å spise eller drikke når han/hun kjeder seg, selv om du ikke tror han/hun er sulten?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Når barnet ditt er sint eller lei seg, gir du ham/henne noe å spise eller drikke selv om du ikke tror at han/hun er sulten?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Hvis barnet ditt ikke liker det som serveres (for eksempel til middag), lager du da noe annet til ham/henne?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Lar du barnet ditt spise snacks når det vil?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Får barnet ditt lov til å gå fra bordet når han/hun er mett, selv om resten av familien ikke er ferdige med å spise?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Oppmuntrer du barnet ditt til å spise sunn mat i stedet for usunn mat?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

	Uenig	Litt uenig	Verken enig eller uenig	Litt enig	Enig
Mesteparten av maten jeg har i huset er sunn	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Jeg har mye snacks (potetchips, ostepop, popcorn etc.) i huset	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Barnet mitt må alltid spise opp all maten på tallerkenen sin	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

	Uenig	Litt uenig	Verken enig eller uenig	Litt enig	Enig
Jeg tilbyr barnet mitt hans/hennes favorittmat dersom han/hun lover å oppføre seg fint	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Hvis jeg ikke passet på eller satte noen begrensninger for mitt barns matinntak, ville han/hun spise for mye av sin favorittmat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Flere ulike sunne matvarer er tilgjengelige for barnet mitt til hvert av måltidene som serveres hjemme	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Jeg tilbyr barnet mitt søtsaker (godterier, is, kaker, kjeks, boller etc.) som belønning for god oppførsel.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Jeg oppmuntrer barnet mitt til å prøve ny mat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

	Uenig	Litt uenig	Verken enig eller uenig	Litt enig	Enig
Jeg forteller barnet mitt at sunn mat smaker godt	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Hvis jeg ikke passet på eller satte noen begrensninger for mitt barns matinntak, ville han/hun spise for mye usunn mat.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Hvis barnet mitt sier, eller på annen måte viser, at han/hun ikke er sulten, prøver jeg å overtale ham/henne til å spise likevel.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

	Uenig	Litt uenig	Verken enig eller uenig	Litt enig	Enig
Jeg gir barnet mitt små porsjoner til måltidene for at han/hun ikke skal bli overvektig	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Jeg holder tilbake søtsaker/dessert som en reaksjon på dårlig oppførsel	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Jeg har mye søtsaker (godterier, is, kaker, kjeks, boller etc.) i huset	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

	Uenig	Litt uenig	Verken enig eller uenig	Litt enig	Enig
Jeg oppmuntrer barnet mitt til å spise variert (mange ulike matvarer og retter)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Hvis barnet mitt kun spiser en liten porsjon prøver jeg å få ham/henne til å spise mer.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Jeg må forsikre meg om at barnet mitt ikke spiser for mye av sin favorittmat.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Jeg må forsikre meg om at barnet mitt ikke spiser for mye søtsaker (godterier, kaker, kjeks, boller etc.)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Jeg er et forbilde for barnet mitt ved selv å spise sunn mat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Jeg prøver å spise sunn mat når jeg er sammen med barnet mitt, selv om denne maten ikke er min favorittmat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

	Uenig	Litt uenig	Verken enig eller uenig	Litt enig	Enig
Jeg viser barnet mitt at jeg virkelig liker å spise sunn mat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Når barnet mitt sier, eller på annen måte viser, at han/hun er ferdig med å spise prøver jeg å få han/henne til å spise en bit til (eller to-tre matbiter til)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

Tusen takk for at du tok deg tid til å svare på spørreskjemaet.

Med vennlig hilsen
Eli Anne Myrvoll Blomkvist
Doktorgradsstipendiat
Universitetet i Agder

Baseline questionnaire (Pedagogical leaders)

Kjære pedagogisk leder,

tusen takk for at du tar deg tid til å delta i forskningsstudien Barns Matmot 2.0.
Spørreskjemaet dreier seg i hovedsak om barnehagens mat- og drikketilbud til barna født
i 2016 og om ditt forhold til måltidene i barnehagen og hvordan disse praktiseres.
Sett deg gjerne et sted hvor du kan sitte uforstyrret og svar så godt du kan.
Undersøkelsen vil ta cirka 15 minutter å besvare.

Trykk på "neste" for å komme i gang.

TUSEN TAKK FOR AT DU DELTAR!
Vennlig hilsen
Eli Anne Myrvoll Blomkvist
Doktorgradsstipendiat
Universitetet i Agder

Først noen spørsmål som dreier seg om rammer knyttet til mat og måltider på din avdeling
i barnehagen.

**Vurder på en skala fra 1-10 i hvilken grad mat og måltider er et av barnehagens
satsningsområder.**
1 = ikke et satsningsområde
10 = et hovedsatsningsområde

_____

Er barnehagen registrert som en "Fem om dagen-barnehage? Et prosjekt fra Opplysningskontoret for frukt og grønt.

(1) ❑ Ja

(2) ❑ Nei

(3) ❑ Vet ikke

Har barna mulighet for å spise følgende måltider i barnehagen? (I tillegg til lunsjen.)

	Ja	Nei	Av og til
Frokost	(1) ❑	(2) ❑	(3) ❑
Mellommåltid før lunsj	(1) ❑	(2) ❑	(3) ❑
Ettermiddagsmåltid	(1) ❑	(2) ❑	(3) ❑
Annet måltid	(1) ❑	(2) ❑	(3) ❑

Har barna med seg mat til noen måltider? I så fall hvilke(t) måltid(er) og dager?

	Aldri	1 dag i uken	2 dager i uken	3 dager i uken	4 dager i uken	5 dager i uken	Ikke aktuelt
Frokost	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Lunsj	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Ettermiddagsmåltidet	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Mellommåltid/andre måltider	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Drikke til ett eller flere måltider	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑

Har barnehagen en ordning hvor barna har medbrakt frukt/grønnsaker? (Det vil si barna har med frukt/grønt/bær hjemmefra til felles deling i barnehagen.)

(1) ❑ Ja

(2)   ❑ Nei

(3)   ❑ I blant

Hvor lang tid brukes det gjennomsnittlig på hovedmåltidet (lunsjen) på avdelingen/gruppen som deltar i studien?

(1)   ❑ Mindre enn 20 minutter

(2)   ❑ 20-30 minutter

(3)   ❑ Mer enn 30 minutter

Har barnehagen ansatt en kokk, kjøkkenassistent eller lignende som har hovedansvaret for matlagingen?

(1)   ❑ Ja, på heltid

(2)   ❑ Ja, på deltid

(3)   ❑ Nei

Hvis barnehagen ikke har kokk/kjøkkenassistent, hvem har hovedansvaret for matlagingen i barnehagen?

(1)   ❑ Styrer

(2)   ❑ Pedagogiske ledere

(3)   ❑ Assistenter/fagarbeidere

(4)   ❑ Andre

(5)   ❑ Ingen faste personer

Noen spørsmål om barnehagens måltidspolitikk og bakgrunn for måltidspraksis.

Hvem bestemmer mat- og drikketilbudet i barnehagen?
(Her kan du sette flere kryss)

(1)   ❑ Styrer

(2)   ❑ Pedagogiske ledere

(3)   ❑ Assistenter/fagarbeidere

(4)   ❑ Kjøkkenassistent, kokk eller lignende

(5)   ❑ Foreldrene

(6)   ❑ Barna

(7)   ❑ Kommunen/eier

I hvilken grad mener du det er behov for å forbedre praksis rundt måltider, mat og drikke i din barnehage?

(1) ❑ I svært liten grad

(2) ❑ I liten grad

(3) ❑ I verken liten eller stor grad

(4) ❑ I stor grad

(5) ❑ I svært stor grad

(6) ❑ Vet ikke

I hvilken grad mener du personalet har behov for kurs og kompetanseutvikling innenfor mat og måltider i barnehagen?

(1) ❑ I svært liten grad

(2) ❑ I liten grad

(3) ❑ I verken liten eller stor grad

(4) ❑ I stor grad

(5) ❑ I svært stor grad

(6) ❑ Vet ikke

Kjenner du til "saperemetoden"?

(1) ❑ Ja

(2) ❑ Nei

Anvendes "saperemetoden" på avdelingen/gruppen som deltar i studien?

(1) ❑ Ja

(2) ❑ Nei

(3) ❑ Vet ikke

Nå kommer noen spørsmål om barnehagens mat og drikketilbud til 2016-barna.
Les spørsmålene nøye og svar så godt du kan. Spørsmålene om mat og drikke er viktige.
Er du i tvil er det fint om du besvarer spørsmålene om mat og drikke med en som har ansvar for mattilbudet, for eksempel kokk/kjøkkenassistent dersom dere har dette.

Hvor ofte tilbys frukt og grønnsakene som er angitt nedenfor?

	Aldri/sjeldne re enn 1 gang i måneden	1-3 ganger i måneden	1-2 ganger per uke	3-4 ganger per uke	5 dager i uken	Flere ganger daglig
Bær (friske/frosne)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Appelsin, klementin	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Banan	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Eple, pære	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Druer	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Annen frukt (kiwi, melon etc)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Hermetisk eller tørket frukt	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Gulrot	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Kålrot	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Blomkål, brokkoli	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Frosne grønnsaksblandinger	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Råkost/salat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Spinat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Løk/purreløk	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Agurk, tomat, paprika	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Erter, bønner, linser	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Mais	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Andre grønnsaker (fennikel, sellerirot, squash etc.)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Usaltede nøtter/mandler	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Hvor ofte tilbys barnegruppen som deltar i studien matvarene som er listet opp nedenfor?

	Aldri/sjeldne re enn 1 gang i måneden	1-3 ganger i måneden	1-2 ganger per uke	3-4 ganger per uke	5 dager i uken	Flere ganger daglig
Fint brød/rundstykker/loff	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

	Aldri/sjeldnere enn 1 gang i måneden	1-3 ganger i måneden	1-2 ganger per uke	3-4 ganger per uke	5 dager i uken	Flere ganger daglig
Grovt brød/rundstykker (minst 50 prosent sammalt mel, hele korn og kjerner)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Grove knekkebrød eller kavringer	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Fine knekkebrød eller kavringer	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Havregrøt	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Industrifremstilt barnegrøt (Nestlé, Semper etc.)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Musli/havregryn uten tilsatt sukker	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Andre frokostblandinger (Corn flakes, puffet ris etc)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Hvor ofte tilbys barnegruppen som deltar i studien matvarene som er listet opp nedenfor?

	Aldri	Sjeldnere enn hver måned	1 gang per måned	2-3 ganger per måned	1 gang per uke	Flere ganger per uke
Salte kjeks	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Søte kjeks, cookies	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Søtt bakverk (kaker, boller, sveler etc)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Salt snacks (chips, ostepop, popcorn etc)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Salte nøtter	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Søtsaker (sjokolade, godterier)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Iskrem, saftis	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Hvor ofte tilbys barnegruppen som deltar i studien følgende drikke i barnehagen?

	Aldri/sjeldne re enn 1 gang i måneden	1-3 ganger i måneden	1-2 ganger per uke	3-4 ganger per uke	5 dager i uken	Flere ganger daglig
Melk (usøtet melk, f.eks. lettmelk eller skummet kulturmelk)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Søtede melkedrikker (f.eks. biola, sjokomelk)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Fruktjuice (uten tilsatt sukker)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Vann	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Drikke tilsatt sukker (brus, saft, nektar, iste, leskedrikk)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Drikke med kunstig søtning (lettbrus, lettsaft etc)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Smoothie laget av frukt og/eller bær	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Hvor ofte tilbys det varm mat på avdelingen/gruppen som deltar i studien?

- (1) ❑ 5 dager i uken
- (2) ❑ 2-4 dager i uken
- (3) ❑ 1 dag i uken
- (4) ❑ 2-3 ganger hver måned
- (5) ❑ 1 gang hver måned
- (6) ❑ Sjeldnere enn hver måned
- (7) ❑ Tilbyr ikke varm mat

Hvor ofte lages den varme maten fra bunnen av?

- (1) ❑ Alltid
- (2) ❑ Ofte
- (3) ❑ Av og til
- (4) ❑ Sjelden
- (5) ❑ Aldri

Hvor ofte tilbys rettene som er listet opp nedenfor?

	Aldri/sjeldnere enn 1 gang i måneden	1-3 ganger i måneden	1 gang per uke	2-4 ganger per uke	Hver dag
Rent rødt kjøtt (f.eks kjøttstykker av okse, svin eller lam)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Rent hvitt kjøtt (f.eks filet eller lårkjøtt av kylling eller kalkun)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Oppblandet kjøtt (hamburger, karbonade, kjøttkaker, kjøttdeig)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Pølser	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Pizza	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Pannekaker	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Mager fisk (torsk, sei, hyse)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Fet fisk (laks, ørret, makrell, sild, kveite)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Oppblandet fisk (fiskekaker, fiskepinner, fiskepudding, fiskegrateng)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Annen sjømat (skalldyr)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Hjemmelagd suppe	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Hjemmelagde gryteretter (lapskaus, frikassé, curry)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Halvfabrikata (suppe eller gryteretter fra pose)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Ferdigretter (fra for eksempel Findus eller Fjordland)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Industriframstilt middag på glass (Nestlé, Semper, Hipp etc)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

Hvor ofte tilbys poteter/pasta/ris og grønnsaker som del av den varme maten?

	Aldri	1-3 ganger i måneden	1 gang per uke	2-4 ganger per uke	Hver dag
Poteter	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Pasta	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Ris	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Grønnsaker (kokte, stekte, rå, salat)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

Hvor ofte kuttes det opp frukt/grønnsaker til barna i barnehagen?

(1) ❑ 5 dager i uken
(2) ❑ 2-4 dager i uken
(3) ❑ 1 dag i uken
(4) ❑ En gang i blant
(5) ❑ Sjelden eller aldri

Hvor ofte deltar barna når det kuttes opp frukt og/eller grønnsaker eller lages varm mat

(1) ❑ Ofte/alltid
(2) ❑ Av og til
(3) ❑ Sjelden
(4) ❑ Aldri

Hvor ofte bakes det i barnehagen?

	5 dager i uken	2-4 dager i uken	1 dag i uken	En gang i blant	Sjelden eller aldri
Fint brød/rundstykker	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Grovt brød/rundstykker	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Boller/kaker/sveler/vafler	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

Hvor ofte deltar barna når det bakes i barnehagen?

(1) ❑ Ofte/alltid
(2) ❑ Av og til

(3) ❑ Sjelden

(4) ❑ Aldri

(5) ❑ Ikke aktuelt (baker ikke i barnehagen)

Blir noen av 2016-barna matet?
Det vil si om en voksen holder skjeen eller deler opp maten og gir den bit for bit, eller om de spiser selv (har egen tallerken med mat og evt. bestikk).

	Alle spiser selv	De fleste spiser selv, men noen blir matet	Omtrent halvparten spiser selv og halvparten blir matet	De fleste blir matet, men noen spiser selv	Ingen spiser selv	Ikke aktuelt
Frokost	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Lunsj	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Ettermiddagsmat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Andre måltider	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Nedenfor følger noen spørsmål om ditt eget måltidsmønster i barnehagen

Har du som ansatt vanligvis med deg niste i barnehagen?
(1) ❑ Ja
(2) ❑ Nei

Hvor ofte sitter du ved bordet og spiser samme mat som barna i barnehagen?

	5 dager i uken	2-4 dager i uken	1 dag i uken	En gang i blant	Sjelden eller aldri	Ikke aktuelt
Frokost	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Lunsj	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Mellommåltid	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Andre måltider	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Hvor enig er du i følgende påstander?

	Helt uenig	Nokså uenig	Litt uenig	Verken enig eller uenig	Litt enig	Nokså enig	Helt enig
Jeg prøver stadig ny og ulik type mat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Jeg stoler ikke på ukjent mat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Hvis jeg ikke kjenner til hva som er i maten, vil jeg ikke smake	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Jeg liker mat fra ulike land	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Etnisk mat ser for merkelig ut til å spises	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
I middagsselskaper prøver jeg gjerne ny mat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Jeg er redd for å spise ting jeg ikke har spist før	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Jeg er veldig kresen på hva slags mat jeg vil spise	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Jeg spiser nesten all slags mat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Jeg liker å prøve nye etniske restauranter	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑

Du vil nå bli bedt om å ta stilling til en rekke påstander knyttet til 2016-barnas spisevaner. Disse spørsmålene er hentet fra et spørreskjema som er beregnet på både små og store barn. Det kan derfor hende at du synes noen av spørsmålene er lite relevante. Svar likevel så godt du kan.
Kryss av på det alternatviet som passer best for deg og barna på avdelingen som deltar i studien.

De første spørsmålene har svaralternatvivene aldri, sjelden, noen ganger, som oftest og alltid

	Aldri	Sjelden	Noen ganger	Som oftest	Alltid
Lar du barna spise det de vil når de er i barnehagen?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

	Aldri	Sjelden	Noen ganger	Som oftest	Alltid
Tenk deg et barnehagemåltid: lar du barna velge den maten de vil blant matvarene som serveres til måltidet?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Når et barn blir masete, er det første du gjør å gi barnet noe å spise eller drikke?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Gir du barna noe å spise eller drikke når de kjeder seg, selv om du ikke tror de er sultne?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Når et barn er sint eller lei seg, gir du barnet noe å spise eller drikke selv om du ikke tror at barnet er sulten?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Hvis et barn ikke liker det som serveres til et måltid, lager du da noe annet til det barnet?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Lar du barna spise snacks når de selv vil?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Får noen av barna lov til å gå fra bordet når de er mette, selv om resten av barnegruppen ikke er ferdige med å spise?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Oppmuntrer du barna til å spise sunn mat i stedet for usunn mat?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

De neste spørsmålene har svaralternativene uenig, litt uenig, verken enig eller uenig, litt enig og enig

	Uenig	Litt uenig	Verken enig eller uenig	Litt enig	Enig
Barna må alltid spise opp all maten på tallerkenen sin	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

	Uenig	Litt uenig	Verken enig eller uenig	Litt enig	Enig
Jeg tilbyr barna favorittmaten deres dersom de lover å oppføre seg fint	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Hvis jeg ikke passet på eller satte noen begrensninger for noen av barnas matinntak, ville de spise for mye av sin favorittmat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Jeg tilbyr barna søtsaker (godteri, is, kjeks etc.) som belønning for god oppførsel	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

	Uenig	Litt uenig	Verken enig eller uenig	Litt enig	Enig
Jeg oppmuntrer barna til å prøve ny mat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Jeg forteller barna at sunn mat smaker godt	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Hvis jeg ikke passet på eller satte noen begrensninger for barnas matinntak, ville de spise for mye usunn mat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Hvis noen av barna sier de ikke er sultne, prøver jeg å overtale de til å spise likevel	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

	Uenig	Litt uenig	Verken enig eller uenig	Litt enig	Enig
Jeg holder tilbake søtsaker/dessert som en reaksjon på dårlig oppførsel	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

	Uenig	Litt uenig	Verken enig eller uenig	Litt enig	Enig
Jeg oppmuntrer barna til å spise variert (mange ulike matvarer og retter)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Hvis noen av barna kun spiser en liten porsjon prøver jeg å få de til å spise mer	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Jeg må forsikre meg om at barna ikke spiser for mye av sin favorittmat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

	Uenig	Litt uenig	Verken enig eller uenig	Litt enig	Enig
Jeg må forsikre meg om at barna ikke spiser for mye søtsaker (godterier, kaker, kjeks etc.)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Jeg er et forbilde for barna ved selv å spise sunn mat.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Jeg prøver å spise sunn mat når jeg er sammen med barna, selv om denne maten ikke er min favorittmat.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Jeg prøver å vise entusiasme når jeg spiser sunn mat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Jeg viser barna at jeg virkelig liker å spise sunn mat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Når et barn sier, eller på annen måte viser, at han/hun er ferdig med å spise prøver jeg å få barnet til å spise en bit til (eller to-tre matbiter til)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

Helt til slutt ber vi deg svare på noen spørsmål om deg selv:

Hvilket kjønn er du?

(1) ❑ Mann

(2) ❑ Kvinne

Hva er din alder?

(1) ❑ Yngre enn 20 år

(2) ❑ 20-25 år

(3) ❑ 26-29 år

(5) ❑ 30-39 år

(6) ❑ 40-49 år

(7) ❑ 50-59 år

(8) ❑ 60-65 år

(9) ❑ Eldre enn 65 år

Hvilken utdannelse har du?
Sett kryss for høyest fullførte utdannelse

(1) ❑ Mindre enn 10 års grunnskole

(2) ❑ Grunnskole

(3) ❑ Videregående skole (inkludert gymnas, yrkesskole, fagbrev)

(4) ❑ Universitet eller høyskole inntil 4 år

(5) ❑ Universitet eller høyskole mer enn 4 år

(6) ❑ Annet

Har du mat og helse som fordypning i din høyskole- eller universitetsutdannelse?

(1) ❑ Ja

(2) ❑ Nei

(3) ❑ Ikke aktuelt (har ikke høyere utdannelse)

Arbeider du heltid eller deltid?

(1) ❑ Heltid (100 prosent)

(2) ❑ Deltid (under 100 prosent)

Tusen takk for dine svar!

Med vennlig hilsen
Doktorgradsstipendiat Eli Anne Myrvoll Blomkvist
Universitetet i Agder

Post-intervention questionnaire (Parents)

Tusen takk for at du tar deg tid til å delta i forskningsstudien Barns matmot 2.0.

Vi ønsker kun én besvarelse per barn. Familien bestemmer selv hvem av foreldrene/foresatte som besvarer spørreskjemaet. Den som fyller ut skjemaet bes gjøre det ut fra det som stemmer for seg selv og barnet født i 2016.

Spørreskjemaet består av to deler. Første del dreier seg i hovedsak om deg og dine kostholdsvaner, mens du i andre del får spørsmål om barnets mat- og spisevaner. Det er spørsmål om barnets fødselsvekt og vekt og høyde ved 12-måneders alder, så det er lurt å ha barnets helsekort lett tilgjengelig. Hele spørreskjemaet vil ta cirka 15-20 minutter å fylle ut. Det kan være lurt at du setter deg et sted hvor du kan sitte uforstyrret. Les spørsmålene nøye og svar så godt du kan.

TUSEN TAKK FOR AT DU DELTAR!
Vennlig hilsen
Eli Anne Myrvoll Blomkvist
Doktorgradsstipendiat
Universitetet i Agder

Først noen spørsmål om deg selv:

Hvilket kjønn er du?

(1) ❑ Mann

(2) ❑ Kvinne

Hvilken relasjon har du til barnet som deltar i undersøkelsen?

(1) ❑ Barnets mor

(2) ❑ Barnets far

(3) ❑ Annen foresatt

Hva er din alder?
Skriv inn alder i hele år, f.eks 32

___

Hvor høy er du?
Oppgi høyde i centimeter, for eksempel 168

___

Hva veier du?
Oppgi vekt i kilo, for eksempel 70

___

Etnisk bakgrunn

	Ja	Nei	Vet ikke
Ble barnets mor født i Norge?	(1) ❑	(2) ❑	(3) ❑
Ble barnets far født i Norge?	(1) ❑	(2) ❑	(3) ❑
Ble barnet som deltar i undersøkelsen født i Norge?	(1) ❑	(2) ❑	(3) ❑

Sivil status

(1) ❑ Enslig

(2) ❑ Gift

(3) ❑ Samboer

(4) ❑ Separert/skilt

(5) ❑ Annet

Bor barnets foreldre/foresatte sammen?

(1) ❑ Ja

(2) ❑ Nei

Hvor mange personer bor det i husholdningen din?

_____

Hvor mange av personene som bor i husholdningen er barn? Inkludert barnet som er med i undersøkelsen.

_____

Hvilken utdannelse har barnets mor?
Marker høyest fullførte utdannelse

(1) ❑ Mindre enn 9 eller 10 års grunnskole

(3) ❑ Grunnskole

(4) ❑ Videregående skole inkludert gymnas/yrkesskole/fagbrev

(5) ❑ Universitet eller høyskole inntil fire år

(6) ❑ Universitet eller høyskole mer enn fire år

Hvilken utdannelse har barnets far?
Marker høyest fullførte utdannelse

(1) ❑ Mindre enn 9 eller 10 års grunnskole

(3) ❑ Grunnskole

(4) ❑ Videregående skole inkludert gymnas/yrkesskole/fagbrev

(5) ❑ Universitet eller høyskole inntil fire år

(6) ❑ Universitet eller høyskole mer enn fire år

Hva er din hovedaktivitet nå for tiden?
Sett ett kryss

(1) ❑ Arbeid heltid

(2) ❑ Arbeid deltid

(3) ❑ Hjemmeværende

(4) ❑ Sykmeldt

Nå kommer noen spørsmål om dine matvaner og matinntak.

Hvor ofte spiser du følgende frukt og bær

	Aldri	Sjeldnere enn 1 gang i måneden	1-3 ganger i måneden	1-2 ganger per uke	3-4 ganger per uke	5-6 ganger per uke	1 gang per dag	Flere ganger per dag
Bær (friske/frosne)	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Appelsin, klementin o.l.	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Banan	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Eple, pære	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Druer	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Annen frukt (kiwi, melon etc)	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Hermetisk frukt	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Rosiner	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Annen tørket frukt	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Smoothie av frukt og/eller bær	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Usaltede nøtter/mandler	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑

Hvor ofte spiser du følgende grønnsaker?

	Aldri	Sjeldnere enn en gang i måneden	1-3 ganger i måneden	1-2 ganger per uke	3-4 ganger per uke	5-6 ganger per uke	1 gang per dag	2 ganger per dag	3 eller flere ganger per dag
Gulrot	(3) ❑	(10) ❑	(9) ❑	(4) ❑	(5) ❑	(11) ❑	(6) ❑	(7) ❑	(8) ❑

	Aldri	Sjeldnere enn en gang i måneden	1-3 ganger i måneden	1-2 ganger per uke	3-4 ganger per uke	5-6 ganger per uke	1 gang per dag	2 ganger per dag	3 eller flere ganger per dag
Kålrot	(3) ❑	(10) ❑	(9) ❑	(4) ❑	(5) ❑	(11) ❑	(6) ❑	(7) ❑	(8) ❑
Blomkål, brokkoli	(3) ❑	(10) ❑	(9) ❑	(4) ❑	(5) ❑	(11) ❑	(6) ❑	(7) ❑	(8) ❑
Frossen grønnsaksblanding	(3) ❑	(10) ❑	(9) ❑	(4) ❑	(5) ❑	(11) ❑	(6) ❑	(7) ❑	(8) ❑
Råkost, bladgrønnsaker (salat)	(3) ❑	(10) ❑	(9) ❑	(4) ❑	(5) ❑	(11) ❑	(6) ❑	(7) ❑	(8) ❑
Spinat	(3) ❑	(10) ❑	(9) ❑	(4) ❑	(5) ❑	(11) ❑	(6) ❑	(7) ❑	(8) ❑
Løk, purreløk	(3) ❑	(10) ❑	(9) ❑	(4) ❑	(5) ❑	(11) ❑	(6) ❑	(7) ❑	(8) ❑
Agurk	(3) ❑	(10) ❑	(9) ❑	(4) ❑	(5) ❑	(11) ❑	(6) ❑	(7) ❑	(8) ❑
Tomat	(3) ❑	(10) ❑	(9) ❑	(4) ❑	(5) ❑	(11) ❑	(6) ❑	(7) ❑	(8) ❑
Erter, bønner og linser	(3) ❑	(10) ❑	(9) ❑	(4) ❑	(5) ❑	(11) ❑	(6) ❑	(7) ❑	(8) ❑
Mais	(3) ❑	(10) ❑	(9) ❑	(4) ❑	(5) ❑	(11) ❑	(6) ❑	(7) ❑	(8) ❑
Paprika	(3) ❑	(10) ❑	(9) ❑	(4) ❑	(5) ❑	(11) ❑	(6) ❑	(7) ❑	(8) ❑
Fennikel	(3) ❑	(10) ❑	(9) ❑	(4) ❑	(5) ❑	(11) ❑	(6) ❑	(7) ❑	(8) ❑
Sellerirot	(3) ❑	(10) ❑	(9) ❑	(4) ❑	(5) ❑	(11) ❑	(6) ❑	(7) ❑	(8) ❑
Andre grønnsaker	(3) ❑	(10) ❑	(9) ❑	(4) ❑	(5) ❑	(11) ❑	(6) ❑	(7) ❑	(8) ❑

I hvilken grad er du enig i følgende påstander?
Svarkategorier fra 1 = helt uenig til 7 = helt enig

	Helt uenig	Nokså uenig	Litt uenig	Verken enig eller uenig	Litt enig	Nokså enig	Helt enig
Jeg prøver stadig ny og ulik type mat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Jeg stoler ikke på ukjent mat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Hvis jeg ikke kjenner til hva som er i maten, vil jeg ikke smake	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Jeg liker mat fra ulike land	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Etnisk mat ser for merkelig ut til å spises	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑

	Helt uenig	Nokså uenig	Litt uenig	Verken enig eller uenig	Litt enig	Nokså enig	Helt enig
I middagsselskaper prøver jeg gjerne ny mat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Jeg er redd for å spise ting jeg ikke har spist før	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Jeg er veldig kresen på hva slags mat jeg vil spise	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Jeg spiser nesten all slags mat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Jeg liker å prøve nye etniske restauranter	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑

Den neste delen dreier seg om barnet som deltar i undersøkelsen.
Du vil få spørsmål om barnets mat, drikke og spisevaner, men først noen bakgrunnsspørsmål om barnet:

Hvilket kjønn er barnet som er med i undersøkelsen?

(1) ❑ Jente

(2) ❑ Gutt

Hva er alderen til barnet som er med i undersøkelsen?
Skriv inn alder i nærmeste antall måneder, f.eks 18

___

Hva var barnets fødselsvekt?
Skriv inn tall i gram, for eksempel 3720

_____

Hva var barnets lengde ved fødsel?
Skriv inn tall i centimeter, for eksempel 49

___

Har barnet vært til 12-månederskontroll ved helsestasjonen?

(1) ❑ Ja

(2) ❑ Nei

Hva var barnets vekt ved måling på 12-månederskontrollen?
Skriv inn vekt i kilo med en desimal, for eksempel 9,5 eller 13,0

_____

Hva var barnets lengde ved måling på 12-månederskontrollen?
Skriv inn lengde i centimeter for eksempel 80 eller 85,5

_____

**Hvis barnet ikke har vært til 12-månederskontroll ennå, hvor gammelt var barnet ved
siste måling av vekt og lengde?**
Fyll inn tall i måneder, for eksempel 9 eller 10,5

_____

Hva var barnets vekt ved siste måling?
Skriv inn tall i kilo med en desimal, for eksempel 7,5 eller 8,0

_____

Spørsmål om barnets mat- og drikkevarer

Får barnet morsmelk nå?
Sett ett kryss

(1) ❑ Ja

(2) ❑ Nei, men barnet har fått morsmelk tidligere

(3) ❑ Nei, barnet har aldri fått morsmelk

Hvor mange ganger i døgnet får barnet morsmelk nå?

(1) ❑ 1 gang

(2) ❑ 2-3 ganger

(3) ❑ 4-5 ganger

(4) ❑ 6-7 ganger

(5) ❑ 8-9 ganger

(6) ❑ 10 ganger eller flere

Hvor gammelt var barnet da det sluttet å få morsmelk?

(1) ❑ 1 uke

(2) ❑ 2 uker

(3) ❑ 3-4 uker

(4) ❑ 2 måneder

(5) ❑ 3 måneder

(6) ❑ 4 måneder

(7) ❑ 5 måneder

(8) ❑ 6 måneder

(9) ❑ 7 måneder

(10) ❑ 8 måneder

(11) ❑ 9 måneder

(12) ❑ 10 måneder

(13) ❑ 11 måneder

(14) ❑ 12 måneder

(15) ❑ Eldre enn 12 måneder

Hvor gammelt var barnet da det fikk følgende matvarer for første gang?

	Har ikke fått	0-2 måneder	3 måneder	4 måneder	5 måneder	6 måneder	7 måneder	8 måneder	9 måneder	10 måneder	11 måneder	12 måneder	Eldre enn 12 måneder	Vet ikke
Industriframstilt grøt/velling (eks. Nestlé, Hipp)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑	(10) ❑	(11) ❑	(12) ❑	(13) ❑	(14) ❑
Hjemmelaget grøt av mel/gryn/ris/kavring	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑	(10) ❑	(11) ❑	(12) ❑	(13) ❑	(14) ❑
Industriframstilt middag på glass (eks. Nestlé, Hipp)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑	(10) ❑	(11) ❑	(12) ❑	(13) ❑	(14) ❑

	Har ikke fått	0-2 måne der	3 måne der	4 måne der	5 måne der	6 måne der	7 måne der	8 måne der	9 måne der	10 måne der	11 måne der	12 måne der	Eldre enn 12 måne der	Vet ikke
Hjemmelaget middag (mos, puré eller biter)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑	(10) ❑	(11) ❑	(12) ❑	(13) ❑	(14) ❑
Industriframstilt frukt-/bærmos/smoothie fra glass, beger eller klemmepose	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑	(10) ❑	(11) ❑	(12) ❑	(13) ❑	(14) ❑
Hjemmelaget frukt-/bærmos/smoothie	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑	(10) ❑	(11) ❑	(12) ❑	(13) ❑	(14) ❑
Yoghurt	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑	(10) ❑	(11) ❑	(12) ❑	(13) ❑	(14) ❑
Brødmat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑	(10) ❑	(11) ❑	(12) ❑	(13) ❑	(14) ❑
Morsmelkerstatning som drikke	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑	(10) ❑	(11) ❑	(12) ❑	(13) ❑	(14) ❑
Kumelk som drikke	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑	(10) ❑	(11) ❑	(12) ❑	(13) ❑	(14) ❑
Vann	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑	(10) ❑	(11) ❑	(12) ❑	(13) ❑	(14) ❑
Fruktjuice	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑	(10) ❑	(11) ❑	(12) ❑	(13) ❑	(14) ❑

Hvor ofte pleier barnet å spise følgende måltider i løpet av en uke?

	En gang i blant	1 gang per uke	2 ganger per uke	3 ganger per uke	4 ganger per uke	5 ganger per uke	6 ganger per uke	Hver dag	Ikke aktuelt/spiser ikke denne typen måltid
Frokost	(1) ❑	(9) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑
Lunsj/formiddagsmat	(1) ❑	(9) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑
Ettermiddagsmat (mellommåltid mellom lunsj og middag)	(1) ❑	(9) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑
Middag	(1) ❑	(9) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑

	En gang i blant	1 gang per uke	2 ganger per uke	3 ganger per uke	4 ganger per uke	5 ganger per uke	6 ganger per uke	Hver dag	Ikke aktuelt/s piser ikke denne typen måltid
Kveldsmat	(1) ☐	(9) ☐	(2) ☐	(3) ☐	(4) ☐	(5) ☐	(6) ☐	(7) ☐	(8) ☐
Andre måltider/mellommåltider	(1) ☐	(9) ☐	(2) ☐	(3) ☐	(4) ☐	(5) ☐	(6) ☐	(7) ☐	(8) ☐

Pleier barnet å bli matet (en voksen holder skjeen eller deler opp maten og gir den bit for bit) eller spiser det selv?
Dersom barnet både spiser litt selv og blir noe matet i ett og samme måltid, velg det svaralternativet som gjelder for størsteparten av måltidet.

(1)   ☐ Spiser selv
(2)   ☐ Blir matet

Hvor ofte spiser barnet følgende måltider sammen med familien?

	Aldri/sjeldnere enn hver uke	1-3 ganger per uke	4-6 ganger per uke	Hver dag	Ikke aktuelt
Frokost	(1) ☐	(2) ☐	(3) ☐	(4) ☐	(5) ☐
Lunsj/formiddagsmat	(1) ☐	(2) ☐	(3) ☐	(4) ☐	(5) ☐
Ettermiddagsmat (mellommåltid mellom lunsj og middag)	(1) ☐	(2) ☐	(3) ☐	(4) ☐	(5) ☐
Middag	(1) ☐	(2) ☐	(3) ☐	(4) ☐	(5) ☐
Kveldsmat	(1) ☐	(2) ☐	(3) ☐	(4) ☐	(5) ☐
Andre måltider/mellommåltider	(1) ☐	(2) ☐	(3) ☐	(4) ☐	(5) ☐

Hvor ofte drikker barnet de nevnte drikkene?

	Aldri	Sjeldnere enn en gang per uke	1 gang per uke	2-3 ganger per uke	4-6 ganger per uke	1 gang per dag	Flere ganger daglig
Melk (usøtet melk f.eks lettmelk eller skummet kulturmelk)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Søtede melkedrikker (f.eks. biola eller sjokomelk)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Fruktjuice (uten tilsatt sukker)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Vann	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Drikke tilsatt sukker (saft, brus, nektar, iste, leskedrikk)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Drikke med kunstig søtning (lettsaft, lettbrus etc)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Smoothie laget av frukt og/eller bær	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑

Hvor ofte spiser barnet følgende frukt og bær?

	Aldri	Sjeldnere enn 1 gang i måneden	1-3 ganger i måneden	1-2 ganger per uke	3-4 ganger per uke	5-6 ganger per uke	1 gang per dag	2 ganger per dag	3 eller flere ganger per dag
Bær (friske/frosne)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Appelsin, klementin o.l	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Banan	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Eple, pære	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Druer	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Annen frukt (kiwi, melon, ananas etc)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Hermetisk frukt	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Rosiner	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Annen tørket frukt	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Usaltede nøtter/mandler	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑

Hvor ofte spiser barnet følgende grønnsaker?

	Aldri	Sjeldnere enn 1 gang i måneden	1-3 ganger i måneden	1-2 ganger per uke	3-4 ganger per uke	5-6 ganger per uke	1 gang per dag	2 ganger per dag	3 eller flere ganger per dag
Gulrot	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Kålrot	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Blomkål, brokkoli	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Frossen grønnsaksblanding	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Råkost, bladgrønnsaker (salat)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Løk, purreløk	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Spinat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Agurk	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Tomat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Erter, bønner, linser	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Mais	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Paprika	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Fennikel	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Sellerirot	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑
Andre grønnsaker	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑	(8) ❑	(9) ❑

Hvor ofte spiser barnet poteter, pasta og ris?

	Aldri	Sjeldnere enn 1 gang i måneden	1-3 ganger i måneden	1-2 ganger per uke	3-4 ganger per uke	5-6 ganger per uke	1 gang per dag	Flere ganger per dag
Poteter (kokt, most)	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Potetmos av pulver	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Pommes frites, stekte poteter	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑

	Aldri	Sjeldnere enn 1 gang i måneden	1-3 ganger i måneden	1-2 ganger per uke	3-4 ganger per uke	5-6 ganger per uke	1 gang per dag	Flere ganger per dag
Pasta (spaghetti, makaroni etc)	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Ris	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Couscous, bulgur	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
"Byggris"	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑

Hvor ofte spiser barnet følgende matretter?
(For eksempel til middag eller som varm lunsj)

	Aldri	Sjeldnere enn 1 gang i måneden	1-3 ganger i måneden	1-2 ganger per uke	3-4 ganger per uke	5-6 ganger per uke	Hver dag
Rent rødt kjøtt (f.eks. kjøttstykker av okse, svin eller lam)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Rent hvitt kjøtt (f.eks. filet eller lårkjøtt av kylling eller kalkun)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Oppblandet kjøtt (hamburger, karbonade, kjøttkaker, kjøttdeig)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Pølser	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Pizza	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Pannekaker	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Mager fisk (torsk, hyse, sei etc)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Fet fisk (laks, ørret, makrell, sild, kveite etc. Ikke som pålegg, spørsmål om det kommer senere)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Oppblandet fisk (fiskekaker, fiskepinner, fiskepudding, fiskegrateng)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑

	Aldri	Sjeldnere enn 1 gang i måneden	1-3 ganger i måneden	1-2 ganger per uke	3-4 ganger per uke	5-6 ganger per uke	Hver dag
Annen sjømat (eks. skalldyr)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Hjemmelagd suppe	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Hjemmelagde gryteretter (lapskaus, frikasse, curry)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Halvfabrikata (for eksempel suppe eller gryteretter fra pose)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Ferdigretter (eks. middager fra Findus eller Fjordland)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Industriframstilte middagsretter på glass (eks. Nestlé, Hipp)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑

Hvilken type fett bruker familien vanligvis til matlaging/steking?
Hvis du bruker flere typer, sett kryss for den du bruker oftest.

(1) ❑ Meierismør
(2) ❑ Melange
(3) ❑ Bremykt
(4) ❑ Myk plantemargarin som Vita og Soft
(5) ❑ Flytende margarin
(6) ❑ Olje (for eksempel oliven-, soya- eller rapsolje)
(7) ❑ Kokosfett/kokosolje
(8) ❑ Rapskokos
(11) ❑ Annet
(10) ❑ Bruker ikke fett til matlaging eller steking

Hvor ofte spiser barnet brød, grøt og frokostblandinger?

	Aldri	Sjeldnere enn 1 gang i måneden	1-3 ganger i måneden	1-2 ganger per uke	3-4 ganger per uke	5-6 ganger per uke	1 gang per dag	Flere ganger per dag
Fint brød/rundstykker, loff	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑

	Aldri	Sjeldnere enn 1 gang i måneden	1-3 ganger i måneden	1-2 ganger per uke	3-4 ganger per uke	5-6 ganger per uke	1 gang per dag	Flere ganger per dag
Grovt brød/rundstykker (minst 50 prosent sammalt mel, hele korn og kjerner)	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Grove knekkebrød eller kavringer	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Fine knekkebrød eller kavringer	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Havregrøt	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Industrifremstilt barnegrøt (eks. Nestle, Hipp)	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Musli/havregryn uten tilsatt sukker	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Andre frokostblandinger (Corn flakes, puffet ris etc)	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑

Hva smører du vanligvis på brødet til barnet?
Hvis du bruker flere typer, sett kryss for det du bruker oftest

(1) ❑ Bruker ikke smør/margarin
(2) ❑ Meierismør
(3) ❑ Bremykt
(4) ❑ Brelett
(5) ❑ Melange
(6) ❑ Soft Flora
(7) ❑ Vita margarin
(8) ❑ Lettmargarin (soft light, vita lett)
(9) ❑ Rapskokos
(10) ❑ Annen type margarin

Hva pleier barnet å spise av pålegg?

	Aldri	Sjeldnere enn 1 gang i måneden	1-3 ganger i måneden	1-2 ganger per uke	3-4 ganger per uke	5-6 ganger per uke	1 gang per dag	Flere ganger per dag
Brunost og vanlig prim	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Prim tilsatt jern (Sprett, Herkules)	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Hvitoster (Jarlsberg, Norvegia, Gouda etc.)	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Smelteoster (baconost, rekeost, skinkeost etc.)	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Leverpostei	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Servelat, skinke, salami eller annet kjøttpålegg	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Makrell i tomat, røkt laks eller annen fisk som pålegg	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Kaviar	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Egg	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Syltetøy eller honning	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Sjokoladepålegg, nøttepålegg, HaPå	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Peanøttsmør	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Majonessalater (f.eks. italiensk salat, rekesalat)	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Frukt som pålegg	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Grønnsaker som pålegg	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑

Hvor ofte spiser barnet kjeks, snacks og søtsaker?

	Aldri	Sjeldnere enn 1 gang i måneden	1-3 ganger i måneden	1-2 ganger per uke	3-4 ganger per uke	5-6 ganger per uke	1 gang per dag	Flere ganger per dag
Salte kjeks	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Søte kjeks, cookies	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑

	Aldri	Sjeldnere enn 1 gang i måneden	1-3 ganger i måneden	1-2 ganger per uke	3-4 ganger per uke	5-6 ganger per uke	1 gang per dag	Flere ganger per dag
Søtt bakverk (kaker, boller etc.)	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Salt snacks (chips, ostepop, popcorn etc.)	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Salte nøtter	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Søtsaker (godterier, sjokolade etc.)	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑
Iskrem, saftis, sorbet	(1) ❑	(9) ❑	(3) ❑	(4) ❑	(5) ❑	(10) ❑	(6) ❑	(7) ❑

Er det noen matvarer det kunne vært aktuelt å gi barnet, men som du unngår å gi fordi du er redd barnet kan reagere med allergi/intoleranse?

(1) ❑ Ja

(2) ❑ Nei

Har barnet fått påvist allergi eller intoleranse?

(1) ❑ Ja

(2) ❑ Nei

Har barnet problemer i forhold til spising/mat?
Her kan du sette flere kryss

(1) ❑ Nei, har ikke noen problemer

(2) ❑ Ja, barnet har dårlig matlyst eller er småspist

(3) ❑ Ja, vanskelig med tilvenning til med fast føde/vanlig mat

(4) ❑ Ja, allergi/intoleranse mot enkelte matvarer

(5) ❑ Ja, andre problemer

Hvis barnet har andre problemer med mat/spising enn det som var oppgitt, vennligst spesifiser her:

_____

_____

_____

_____

_____

_____

Hvor ofte får barnet tilskudd av tran, vitaminer og mineraler nå for tiden?

	Aldri	Sjeldnere enn ukentlig	1-3 ganger per uke	4-6 ganger per uke	1 gang per dag	2 eller flere ganger per dag
Multivitaminer, flytende multivitamintilskudd (sanasol, multi, biovit), vitaminbjørner	(1) ☐	(2) ☐	(3) ☐	(4) ☐	(5) ☐	(6) ☐
Vitamin D-dråper eller andre D-vitamintilskudd	(1) ☐	(2) ☐	(3) ☐	(4) ☐	(5) ☐	(6) ☐
Tran/fiskeolje, flytende, kapsler eller tyggetabletter	(1) ☐	(2) ☐	(3) ☐	(4) ☐	(5) ☐	(6) ☐
Annet kosttilskudd	(1) ☐	(2) ☐	(3) ☐	(4) ☐	(5) ☐	(6) ☐

Dersom barnet får andre kosttilskudd enn det som er oppgitt, skriv type(r) og hvor ofte barnet får det:

_____

_____

_____

_____

_____

_____

Hvilke grønnsaker liker barnet?

	Liker godt	Liker litt	Verken liker eller misliker	Liker ikke noe særlig	Liker ikke i det hele tatt	Har aldri smakt
Grønne bønner/aspargesbønner	(1) ☐	(2) ☐	(3) ☐	(4) ☐	(5) ☐	(6) ☐
Brokkoli	(1) ☐	(2) ☐	(3) ☐	(4) ☐	(5) ☐	(6) ☐
Spinat	(1) ☐	(2) ☐	(3) ☐	(4) ☐	(5) ☐	(6) ☐

	Liker godt	Liker litt	Verken liker eller misliker	Liker ikke noe særlig	Liker ikke i det hele tatt	Har aldri smakt
Gulrot	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Gresskar	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Søtpotet	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Mais	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Grønne erter	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Poteter (kokt, most, stekt)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Squash	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Kål	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Løk, purreløk	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Blomkål	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Rosenkål	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Salat og andre bladgrønnsaker	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Sellerirot	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Fennikel	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Tomat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Agurk	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Sopp	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Chili	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Aubergine	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Hvilke frukter liker barnet?

	Liker godt	Liker litt	Verken liker eller misliker	Liker ikke noe særlig	Liker ikke i det hele tatt	Har aldri smakt
Avokado	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Eple	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Pære	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Fersken, nektarin	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

	Liker godt	Liker litt	Verken liker eller misliker	Liker ikke noe særlig	Liker ikke i det hele tatt	Har aldri smakt
Banan	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Appelsiner, klementiner	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Melon	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Plommer	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Druer	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Mango	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Papaya	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Ananas	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Kiwi	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Rosiner	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Hermetisk frukt	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Bær	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Takk for at du har svart så langt! Dine svar er viktige for studien.
De neste spørsmålene handler om måltidssituasjoner og hvordan barnet forholder seg til ny mat.

"Det er lett å få barnet mitt til å spise, sammenlignet med andre barn på samme alder."
Hvor enig er du i dette utsagnet?

(1) ❑ Svært enig
(2) ❑ Enig
(3) ❑ Verken enig eller uenig
(4) ❑ Uenig
(5) ❑ Svært uenig

Hvor ofte avviser barnet ditt mat det får servert/tilbudt?

(1) ❑ Svært ofte
(2) ❑ Ofte
(3) ❑ Noen ganger
(4) ❑ Nesten aldri

(5) ❏ Aldri

Synes du barnet ditt er kresen eller sær i matveien?

(1) ❏ Svært kresen/sær

(2) ❏ Litt kresen/sær

(3) ❏ Ikke kresen/sær

(4) ❏ Usikker

De neste spørsmålene handler om hvordan barnet ditt reagerer på ny eller ukjent mat.

Hvor villig er barnet ditt til å spise nye matvarer det ikke har smakt før?

(1) ❏ Svært villig

(2) ❏ Villig

(3) ❏ Verken eller

(4) ❏ Motvillig

(5) ❏ Svært motvillig

Hvor enig eller uenig er du i påstandene under?

	Helt uenig	Nokså uenig	Litt uenig	Verken enig eller uenig	Litt enig	Nokså enig	Helt enig
Barnet mitt prøver stadig ny og ulik type mat	(1) ❏	(2) ❏	(3) ❏	(4) ❏	(5) ❏	(6) ❏	(7) ❏
Barnet mitt stoler ikke på ukjent mat	(1) ❏	(2) ❏	(3) ❏	(4) ❏	(5) ❏	(6) ❏	(7) ❏
Hvis barnet mitt ikke vet hva som er i maten vil han/hun ikke smake	(1) ❏	(2) ❏	(3) ❏	(4) ❏	(5) ❏	(6) ❏	(7) ❏
Barnet mitt er redd for å spise ting han/hun ikke har spist før	(1) ❏	(2) ❏	(3) ❏	(4) ❏	(5) ❏	(6) ❏	(7) ❏
Barnet mitt er veldig kresen på hva slags mat han/hun vil spise	(1) ❏	(2) ❏	(3) ❏	(4) ❏	(5) ❏	(6) ❏	(7) ❏

	Helt uenig	Nokså uenig	Litt uenig	Verken enig eller uenig	Litt enig	Nokså enig	Helt enig
Barnet mitt spiser nesten all slags mat	(1) ❏	(2) ❏	(3) ❏	(4) ❏	(5) ❏	(6) ❏	(7) ❏

Hvor ofte blir barnet ditt tilbudt nye/ukjente matvarer?

(1) ❏ Veldig ofte

(2) ❏ Ofte

(3) ❏ Noen ganger

(4) ❏ Sjelden

(5) ❏ Aldri

Hvor mange ganger tilbyr du barnet ditt en matvare før du avgjør om barnet liker matvaren eller ikke?

(1) ❏ Én gang

(2) ❏ To ganger

(3) ❏ 3-5 ganger

(4) ❏ 6-10 ganger

(5) ❏ 11 ganger eller flere

Hvordan reagerer du hvis barnet avviser en ny matvare som han/hun ikke har smakt før?

	Aldri	Sjelden	Noen ganger	Ofte
Antar at barnet ikke liker matvaren og slutter å tilby matvaren	(1) ❏	(2) ❏	(3) ❏	(4) ❏
Neste gang vil jeg blande matvaren i annen mat for å "gjemme" den	(1) ❏	(2) ❏	(3) ❏	(4) ❏
Jeg tilbyr matvaren igjen, men da sammen med andre matvarer som barnet mitt liker	(1) ❏	(2) ❏	(3) ❏	(4) ❏

Hender det at barnet ditt avviser mat som han/hun vanligvis spiser?

(1) ❏ Svært ofte

(2) ❏ Ofte

(3) ❏ Noen ganger

(4) ❏ Nesten aldri

(5) ❏ Aldri

Hvis barnet ditt avviser mat som han/hun vanligvis spiser, vil du...?
Sett et kryss for hver påstand.

	Aldri	Sjelden	Noen ganger	Ofte	Som oftest
insistere på at barnet skal spise maten	(1) ❏	(2) ❏	(3) ❏	(4) ❏	(5) ❏
tilby melk i stedet	(1) ❏	(2) ❏	(3) ❏	(4) ❏	(5) ❏
tilby en annen matvare som han/hun liker	(1) ❏	(2) ❏	(3) ❏	(4) ❏	(5) ❏
oppmuntre barnet til å spise ved å gjøre måltidet til en lek, for eksempel ved å late som om skjeen er et fly	(1) ❏	(2) ❏	(3) ❏	(4) ❏	(5) ❏
oppmuntre barnet til å spise ved å tilby en spiselig belønning, for eksempel dessert	(1) ❏	(2) ❏	(3) ❏	(4) ❏	(5) ❏
oppmuntre barnet til å spise ved å tilby en belønning som ikke er mat, for eksempel en leke eller å få se på tv	(1) ❏	(2) ❏	(3) ❏	(4) ❏	(5) ❏
la være å tilby mer mat fram til neste vanlige måltid, for eksempel kveldsmat	(1) ❏	(2) ❏	(3) ❏	(4) ❏	(5) ❏
godta at barnet kanskje ikke er sulten og ta vekk maten	(1) ❏	(2) ❏	(3) ❏	(4) ❏	(5) ❏
straffe barnet	(1) ❏	(2) ❏	(3) ❏	(4) ❏	(5) ❏

Hvem bestemmer hva barnet skal spise
-du (eventuelt en annen voksen) eller barnet?

(1) ❑ Kun du

(2) ❑ For det meste du

(3) ❑ Både du og barnet

(4) ❑ For det meste barnet

(5) ❑ Kun barnet

Hvem bestemmer hvor mye mat barnet skal spise
-du (eventuelt en annen voksen) eller barnet?

(1) ❑ Kun du

(2) ❑ For det meste du

(3) ❑ Både du og barnet

(4) ❑ For det meste barnet

(5) ❑ Kun barnet

Du vil nå bli bedt om å ta stilling til påstander knyttet til barnets matvaner.
Disse spørsmålene er hentet fra et spørreskjema som er beregnet for både små og større barn. Det kan derfor være at du synes enkelte av spørsmålene er lite relevante. Svar likevel så godt du kan.
Kryss av på det alternativet som passer best for deg og barnet ditt.

	Aldri	Sjelden	Noen ganger	Som oftest	Alltid
Lar du barnet ditt spise hva han/hun vil?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Tenk deg et middagsmåltid: lar du barnet velge den maten han/hun vil blant matvarene som serveres til middag?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Når barnet ditt blir masete, er det første du gjør å gi han/henne noe å spise eller	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

	Aldri	Sjelden	Noen ganger	Som oftest	Alltid
drikke selv om du ikke tror at han/hun er sulten?					
Gir du barnet ditt noe å spise eller drikke når han/hun kjeder seg, selv om du ikke tror han/hun er sulten?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Når barnet ditt er sint eller lei seg, gir du ham/henne noe å spise eller drikke selv om du ikke tror at han/hun er sulten?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Hvis barnet ditt ikke liker det som serveres (for eksempel til middag), lager du da noe annet til ham/henne?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Lar du barnet ditt spise snacks når det vil?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Får barnet ditt lov til å gå fra bordet når han/hun er mett, selv om resten av familien ikke er ferdige med å spise?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Oppmuntrer du barnet ditt til å spise sunn mat i stedet for usunn mat?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

	Uenig	Litt uenig	Verken enig eller uenig	Litt enig	Enig
Mesteparten av maten jeg har i huset er sunn	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Jeg har mye snacks (potetchips, ostepop, popcorn etc.) i huset	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Barnet mitt må alltid spise opp all maten på tallerkenen sin	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

	Uenig	Litt uenig	Verken enig eller uenig	Litt enig	Enig
Jeg tilbyr barnet mitt hans/hennes favorittmat dersom han/hun lover å oppføre seg fint	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Hvis jeg ikke passet på eller satte noen begrensninger for mitt barns matinntak, ville han/hun spise for mye av sin favorittmat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Flere ulike sunne matvarer er tilgjengelige for barnet mitt til hvert av måltidene som serveres hjemme	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Jeg tilbyr barnet mitt søtsaker (godterier, is, kaker, kjeks, boller etc.) som belønning for god oppførsel.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Jeg oppmuntrer barnet mitt til å prøve ny mat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

	Uenig	Litt uenig	Verken enig eller uenig	Litt enig	Enig
Jeg forteller barnet mitt at sunn mat smaker godt	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Hvis jeg ikke passet på eller satte noen begrensninger for mitt barns matinntak, ville han/hun spise for mye usunn mat.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Hvis barnet mitt sier, eller på annen måte viser, at han/hun ikke er sulten, prøver jeg å overtale ham/henne til å spise likevel.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

	Uenig	Litt uenig	Verken enig eller uenig	Litt enig	Enig
Jeg gir barnet mitt små porsjoner til måltidene for at han/hun ikke skal bli overvektig	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Jeg holder tilbake søtsaker/dessert som en reaksjon på dårlig oppførsel	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Jeg har mye søtsaker (godterier, is, kaker, kjeks, boller etc.) i huset	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

	Uenig	Litt uenig	Verken enig eller uenig	Litt enig	Enig
Jeg oppmuntrer barnet mitt til å spise variert (mange ulike matvarer og retter)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Hvis barnet mitt kun spiser en liten porsjon prøver jeg å få ham/henne til å spise mer.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Jeg må forsikre meg om at barnet mitt ikke spiser for mye av sin favorittmat.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Jeg må forsikre meg om at barnet mitt ikke spiser for mye søtsaker (godterier, kaker, kjeks, boller etc.)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Jeg er et forbilde for barnet mitt ved selv å spise sunn mat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Jeg prøver å spise sunn mat når jeg er sammen med barnet mitt, selv om denne maten ikke er min favorittmat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

	Uenig	Litt uenig	Verken enig eller uenig	Litt enig	Enig
Jeg viser barnet mitt at jeg virkelig liker å spise sunn mat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Når barnet mitt sier, eller på annen måte viser, at han/hun er ferdig med å spise prøver jeg å få han/henne til å spise en bit til (eller to-tre matbiter til)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

Tilleggsspørsmål i spørreskjemaet til intervensjonsgruppe 1:
Helt til slutt er det noen spørsmål om gjennomføringen av forskningsprosjektet Barns matmot på ditt barns avdeling i barnehagen.

Som en del av Barns matmot har foreldre fått tilgang til en internettside med oppskrifter.

	Ja	Nei
Har du vært inne på nettsiden?	(1) ❑	(2) ❑
Har du brukt noen av oppskriftene på nettsiden?	(1) ❑	(2) ❑

Hvordan likte du innholdet på nettsiden

	Veldig godt	Godt	Ikke særlig godt	Ikke i det hele tatt	Vet ikke/Ikke aktuelt
Hvordan likte du nettsiden som helhet?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Hvordan likte du oppskriftene med tanke på forklaring og bilder?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

I hvilken grad mener du at tiltakene i Barns matmot har ført til en positiv endring av mat- eller måltidssituasjoner for barnet som har deltatt i prosjektet?

(1) ❑ I svært stor grad

(2) ❑ I stor grad

(3) ❑ I hverken stor eller liten grad

(4) ❑ I liten grad

(5) ❑ Ikke i det hele tatt

I hvilken grad mener du at tiltakene i Barns matmot har ført til en positiv endring av mat- eller måltidssituasjoner for deg selv eller hos andre i familien din?

(1) ❑ I svært stor grad

(2) ❑ I stor grad

(3) ❑ I hverken stor eller liten grad

(4) ❑ I liten grad

(5) ❑ Ikke i det hele tatt

Alt i alt, hva synes du om prosjektet Barns matmot på ditt barns avdeling?

(1) ❑ Jeg likte det veldig godt

(2) ❑ Jeg likte det godt

(3) ❑ Jeg likte det ikke særlig godt

(4) ❑ Jeg likte det ikke i det hele tatt

(5) ❑ Jeg kjenner ikke til prosjektet "Barns matmot"

Dersom du har kommentarer til prosjektet vil vi gjerne at du skriver her:

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Tilleggsspørsmål i spørreskjemaet til intervensjonsgruppe 2:

Helt til slutt er det noen spørsmål om gjennomføringen av forskningsprosjektet Barns matmot på ditt barns avdeling i barnehagen.

Som en del av Barns matmot har foreldre fått tilgang til en internettside med oppskrifter og informasjonsfilmer.

	Ja	Nei
Har du vært inne på nettsiden?	(1) ❑	(2) ❑
Har du brukt noen av oppskriftene på nettsiden?	(1) ❑	(2) ❑
Har du sett videofilmene som ligger på nettsiden?	(1) ❑	(2) ❑

Hvordan likte du innholdet på nettsiden

	Veldig godt	Godt	Ikke særlig godt	Ikke i det hele tatt	Vet ikke/Ikke aktuelt
Hvordan likte du nettsiden som helhet?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Hvordan likte du oppskriftene med tanke på forklaring og bilder?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Hvordan likte du filmene med tanke på design, lyd og bilder?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Hvordan likte du filmene med tanke på budskap/informasjon?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

I hvilken grad mener du at tiltakene i Barns matmot har ført til en positiv endring av mat- eller måltidssituasjoner for barnet som har deltatt i prosjektet?

(1) ❑ I svært stor grad

(2) ❑ I stor grad

(3) ❑ I hverken stor eller liten grad

(4) ☐ I liten grad

(5) ☐ Ikke i det hele tatt

I hvilken grad mener du at tiltakene i Barns matmot har ført til en positiv endring av mat- eller måltidssituasjoner for deg selv eller hos andre i familien din?

(1) ☐ I svært stor grad

(2) ☐ I stor grad

(3) ☐ I hverken stor eller liten grad

(4) ☐ I liten grad

(5) ☐ Ikke i det hele tatt

Alt i alt, hva synes du om prosjektet Barns matmot på ditt barns avdeling?

(1) ☐ Jeg likte det veldig godt

(2) ☐ Jeg likte det godt

(3) ☐ Jeg likte det ikke særlig godt

(4) ☐ Jeg likte det ikke i det hele tatt

(5) ☐ Jeg kjenner ikke til prosjektet "Barns matmot"

Dersom du har kommentarer til prosjektet vil vi gjerne at du skriver her:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Tusen takk for at du tok deg tid til å svare på spørreskjemaet.

Med vennlig hilsen
Eli Anne Myrvoll Blomkvist
Doktorgradsstipendiat

Universitetet i Agder

barns mat
mot
2.0

Post-intervention questionnaire (Pedagogical leaders)

Kjære avdelingsleder,

tusen takk for at du tar deg tid til å delta i forskningsstudien Barns Matmot 2.0.
Spørreskjemaet dreier seg i hovedsak om barnehagens mat- og drikketilbud til barna født
i 2016 og om ditt forhold til måltidene i barnehagen og hvordan disse praktiseres.
Sett deg gjerne et sted hvor du kan sitte uforstyrret og svar så godt du kan.
Undersøkelsen vil ta cirka 15 minutter å besvare.

Trykk på "neste" for å komme i gang.

TUSEN TAKK FOR AT DU DELTAR!
Vennlig hilsen
Eli Anne Myrvoll Blomkvist
Doktorgradsstipendiat
Universitetet i Agder

Først noen spørsmål som dreier seg om rammer knyttet til mat og måltider på din avdeling
i barnehagen.

**Vurder på en skala fra 1-10 i hvilken grad mat og måltider er et av barnehagens
satsningsområder.**
1 = ikke et satsningsområde
10 = et hovedsatsningsområde

_____

Er barnehagen registrert som en "Fem om dagen-barnehage? Et prosjekt fra Opplysningskontoret for frukt og grønt.

(1) ❑ Ja

(2) ❑ Nei

(3) ❑ Vet ikke

Har barna mulighet for å spise følgende måltider i barnehagen? (I tillegg til lunsjen.)

	Ja	Nei	Av og til
Frokost	(1) ❑	(2) ❑	(3) ❑
Mellommåltid før lunsj	(1) ❑	(2) ❑	(3) ❑
Ettermiddagsmåltid	(1) ❑	(2) ❑	(3) ❑
Annet måltid	(1) ❑	(2) ❑	(3) ❑

Har barna med seg mat til noen måltider? I så fall hvilke(t) måltid(er) og dager?

	Aldri	1 dag i uken	2 dager i uken	3 dager i uken	4 dager i uken	5 dager i uken	Ikke aktuelt
Frokost	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Lunsj	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Ettermiddagsmåltidet	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Mellommåltid/andre måltider	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Drikke til ett eller flere måltider	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑

Har barnehagen en ordning hvor barna har medbrakt frukt/grønnsaker? (Det vil si barna har med frukt/grønt/bær hjemmefra til felles deling i barnehagen.)

(1) ❑ Ja

(2) ❑ Nei

(3) ❑ I blant

Hvor lang tid brukes det gjennomsnittlig på hovedmåltidet (lunsjen) på avdelingen/gruppen som deltar i studien?

(1) ❑ Mindre enn 20 minutter

(2) ❑ 20-30 minutter

(3) ❑ Mer enn 30 minutter

Har barnehagen ansatt en kokk, kjøkkenassistent eller lignende som har hovedansvaret for matlagingen?

(1) ❑ Ja, på heltid

(2) ❑ Ja, på deltid

(3) ❑ Nei

Hvis barnehagen ikke har kokk/kjøkkenassistent, hvem har hovedansvaret for matlagingen i barnehagen?

(1) ❑ Styrer

(2) ❑ Pedagogiske ledere

(3) ❑ Assistenter/fagarbeidere

(4) ❑ Andre

(5) ❑ Ingen faste personer

Noen spørsmål om barnehagens måltidspolitikk og bakgrunn for måltidspraksis.

Hvem bestemmer mat- og drikketilbudet i barnehagen?
(Her kan du sette flere kryss)

(1) ❑ Styrer

(2) ❑ Pedagogiske ledere

(3) ❑ Assistenter/fagarbeidere

(4) ❑ Kjøkkenassistent, kokk eller lignende

(5) ❑ Foreldrene

(6) ❑ Barna

(7) ❑ Kommunen/eier

I hvilken grad mener du det er behov for å forbedre praksis rundt måltider, mat og drikke i din barnehage?

(1) ❑ I svært liten grad

(2) ❑ I liten grad

(3) ❑ I verken liten eller stor grad

(4) ❑ I stor grad

(5) ❑ I svært stor grad

(6) ❑ Vet ikke

I hvilken grad mener du personalet har behov for kurs og kompetanseutvikling innenfor mat og måltider i barnehagen?

(1) ❑ I svært liten grad

(2) ❑ I liten grad

(3) ❑ I verken liten eller stor grad

(4) ❑ I stor grad

(5) ❑ I svært stor grad

(6) ❑ Vet ikke

Kjenner du til "saperemetoden"?

(1) ❑ Ja

(2) ❑ Nei

Anvendes "saperemetoden" på avdelingen/gruppen som deltar i studien?

(1) ❑ Ja

(2) ❑ Nei

(3) ❑ Vet ikke

Nå kommer noen spørsmål om barnehagens mat og drikketilbud til 2016-barna.
Les spørsmålene nøye og svar så godt du kan. Spørsmålene om mat og drikke er viktige.
Er du i tvil er det fint om du besvarer spørsmålene om mat og drikke med en som har
ansvar for mattilbudet, for eksempel kokk/kjøkkenassistent dersom dere har dette.

Hvor ofte tilbys frukt og grønnsakene som er angitt nedenfor?

	Aldri/sjeldnere enn 1 gang i måneden	1-3 ganger i måneden	1-2 ganger per uke	3-4 ganger per uke	5 dager i uken	Flere ganger daglig
Bær (friske/frosne)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Appelsin, klementin	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Banan	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Eple, pære	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Druer	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Annen frukt (kiwi, melon etc)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Hermetisk eller tørket frukt	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Gulrot	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Kålrot	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Blomkål, brokkoli	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Frosne grønnsaksblandinger	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Råkost/salat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Spinat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Løk/purreløk	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Agurk, tomat, paprika	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Erter, bønner, linser	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Mais	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Andre grønnsaker (fennikel, sellerirot, squash etc.)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Usaltede nøtter/mandler	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Hvor ofte tilbys barnegruppen som deltar i studien matvarene som er listet opp nedenfor?

	Aldri/sjeldnere enn 1 gang i måneden	1-3 ganger i måneden	1-2 ganger per uke	3-4 ganger per uke	5 dager i uken	Flere ganger daglig
Fint brød/rundstykker/loff	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

	Aldri/sjeldnere enn 1 gang i måneden	1-3 ganger i måneden	1-2 ganger per uke	3-4 ganger per uke	5 dager i uken	Flere ganger daglig
Grovt brød/rundstykker (minst 50 prosent sammalt mel, hele korn og kjerner)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Grove knekkebrød eller kavringer	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Fine knekkebrød eller kavringer	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Havregrøt	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Industrifremstilt barnegrøt (Nestlé, Semper etc.)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Musli/havregryn uten tilsatt sukker	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Andre frokostblandinger (Corn flakes, puffet ris etc)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Hvor ofte tilbys barnegruppen som deltar i studien matvarene som er listet opp nedenfor?

	Aldri	Sjeldnere enn hver måned	1 gang per måned	2-3 ganger per måned	1 gang per uke	Flere ganger per uke
Salte kjeks	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Søte kjeks, cookies	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Søtt bakverk (kaker, boller, sveler etc)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Salt snacks (chips, ostepop, popcorn etc)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Salte nøtter	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Søtsaker (sjokolade, godterier)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Iskrem, saftis	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Hvor ofte tilbys barnegruppen som deltar i studien følgende drikke i barnehagen?

	Aldri/sjeldnere enn 1 gang i måneden	1-3 ganger i måneden	1-2 ganger per uke	3-4 ganger per uke	5 dager i uken	Flere ganger daglig
Melk (usøtet melk, f.eks. lettmelk eller skummet kulturmelk)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Søtede melkedrikker (f.eks. biola, sjokomelk)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Fruktjuice (uten tilsatt sukker)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Vann	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Drikke tilsatt sukker (brus, saft, nektar, iste, leskedrikk)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Drikke med kunstig søtning (lettbrus, lettsaft etc)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Smoothie laget av frukt og/eller bær	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Hvor ofte tilbys det varm mat på avdelingen/gruppen som deltar i studien?

(1) ❑ 5 dager i uken
(2) ❑ 2-4 dager i uken
(3) ❑ 1 dag i uken
(4) ❑ 2-3 ganger hver måned
(5) ❑ 1 gang hver måned
(6) ❑ Sjeldnere enn hver måned
(7) ❑ Tilbyr ikke varm mat

Hvor ofte lages den varme maten fra bunnen av?

(1) ❑ Alltid
(2) ❑ Ofte
(3) ❑ Av og til
(4) ❑ Sjelden
(5) ❑ Aldri

Hvor ofte tilbys rettene som er listet opp nedenfor?

	Aldri/sjeldnere enn 1 gang i måneden	1-3 ganger i måneden	1 gang per uke	2-4 ganger per uke	Hver dag
Rent rødt kjøtt (f.eks kjøttstykker av okse, svin eller lam)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Rent hvitt kjøtt (f.eks filet eller lårkjøtt av kylling eller kalkun)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Oppblandet kjøtt (hamburger, karbonade, kjøttkaker, kjøttdeig)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Pølser	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Pizza	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Pannekaker	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Mager fisk (torsk, sei, hyse)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Fet fisk (laks, ørret, makrell, sild, kveite)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Oppblandet fisk (fiskekaker, fiskepinner, fiskepudding, fiskegrateng)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Annen sjømat (skalldyr)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Hjemmelagd suppe	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Hjemmelagde gryteretter (lapskaus, frikassé, curry)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Halvfabrikata (suppe eller gryteretter fra pose)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Ferdigretter (fra for eksempel Findus eller Fjordland)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Industriframstilt middag på glass (Nestlé, Semper, Hipp etc)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

Hvor ofte tilbys poteter/pasta/ris og grønnsaker som del av den varme maten?

	Aldri	1-3 ganger i måneden	1 gang per uke	2-4 ganger per uke	Hver dag
Poteter	(1) ❏	(2) ❏	(3) ❏	(4) ❏	(5) ❏
Pasta	(1) ❏	(2) ❏	(3) ❏	(4) ❏	(5) ❏
Ris	(1) ❏	(2) ❏	(3) ❏	(4) ❏	(5) ❏
Grønnsaker (kokte, stekte, rå, salat)	(1) ❏	(2) ❏	(3) ❏	(4) ❏	(5) ❏

Hvor ofte kuttes det opp frukt/grønnsaker til barna i barnehagen?

(1) ❏ 5 dager i uken

(2) ❏ 2-4 dager i uken

(3) ❏ 1 dag i uken

(4) ❏ En gang i blant

(5) ❏ Sjelden eller aldri

Hvor ofte deltar barna når det kuttes opp frukt og/eller grønnsaker eller lages varm mat

(1) ❏ Ofte/alltid

(2) ❏ Av og til

(3) ❏ Sjelden

(4) ❏ Aldri

Hvor ofte bakes det i barnehagen?

	5 dager i uken	2-4 dager i uken	1 dag i uken	En gang i blant	Sjelden eller aldri
Fint brød/rundstykker	(1) ❏	(2) ❏	(3) ❏	(4) ❏	(5) ❏
Grovt brød/rundstykker	(1) ❏	(2) ❏	(3) ❏	(4) ❏	(5) ❏
Boller/kaker/sveler/vafler	(1) ❏	(2) ❏	(3) ❏	(4) ❏	(5) ❏

Hvor ofte deltar barna når det bakes i barnehagen?

(1) ❏ Ofte/alltid

(2) ❏ Av og til

(3) ❑ Sjelden

(4) ❑ Aldri

(5) ❑ Ikke aktuelt (baker ikke i barnehagen)

Blir noen av 2016-barna matet?

Det vil si om en voksen holder skjeen eller deler opp maten og gir den bit for bit, eller om de spiser selv (har egen tallerken med mat og evt. bestikk).

	Alle spiser selv	De fleste spiser selv, men noen blir matet	Omtrent halvparten spiser selv og halvparten blir matet	De fleste blir matet, men noen spiser selv	Ingen spiser selv	Ikke aktuelt
Frokost	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Lunsj	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Ettermiddagsmat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Andre måltider	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Nedenfor følger noen spørsmål om ditt eget måltidsmønster i barnehagen

Har du som ansatt vanligvis med deg niste i barnehagen?

(1) ❑ Ja

(2) ❑ Nei

Hvor ofte sitter du ved bordet og spiser samme mat som barna i barnehagen?

	5 dager i uken	2-4 dager i uken	1 dag i uken	En gang i blant	Sjelden eller aldri	Ikke aktuelt
Frokost	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Lunsj	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Mellommåltid	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Andre måltider	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Hvor enig er du i følgende påstander?

	Helt uenig	Nokså uenig	Litt uenig	Verken enig eller uenig	Litt enig	Nokså enig	Helt enig
Jeg prøver stadig ny og ulik type mat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Jeg stoler ikke på ukjent mat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Hvis jeg ikke kjenner til hva som er i maten, vil jeg ikke smake	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Jeg liker mat fra ulike land	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Etnisk mat ser for merkelig ut til å spises	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
I middagsselskaper prøver jeg gjerne ny mat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Jeg er redd for å spise ting jeg ikke har spist før	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Jeg er veldig kresen på hva slags mat jeg vil spise	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Jeg spiser nesten all slags mat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Jeg liker å prøve nye etniske restauranter	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑

Du vil nå bli bedt om å ta stilling til en rekke påstander knyttet til 2016-barnas spisevaner. Disse spørsmålene er hentet fra et spørreskjema som er beregnet på både små og store barn. Det kan derfor hende at du synes noen av spørsmålene er lite relevante. Svar likevel så godt du kan.
Kryss av på det alternatviet som passer best for deg og barna på avdelingen som deltar i studien.

De første spørsmålene har svaralternatvivene aldri, sjelden, noen ganger, som oftest og alltid

	Aldri	Sjelden	Noen ganger	Som oftest	Alltid
Lar du barna spise det de vil når de er i barnehagen?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

	Aldri	Sjelden	Noen ganger	Som oftest	Alltid
Tenk deg et barnehagemåltid: lar du barna velge den maten de vil blant matvarene som serveres til måltidet?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Når et barn blir masete, er det første du gjør å gi barnet noe å spise eller drikke?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Gir du barna noe å spise eller drikke når de kjeder seg, selv om du ikke tror de er sultne?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Når et barn er sint eller lei seg, gir du barnet noe å spise eller drikke selv om du ikke tror at barnet er sulten?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Hvis et barn ikke liker det som serveres til et måltid, lager du da noe annet til det barnet?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Lar du barna spise snacks når de selv vil?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Får noen av barna lov til å gå fra bordet når de er mette, selv om resten av barnegruppen ikke er ferdige med å spise?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Oppmuntrer du barna til å spise sunn mat i stedet for usunn mat?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

De neste spørsmålene har svaralternativene uenig, litt uenig, verken enig eller uenig, litt enig og enig

	Uenig	Litt uenig	Verken enig eller uenig	Litt enig	Enig
Barna må alltid spise opp all maten på tallerkenen sin	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

	Uenig	Litt uenig	Verken enig eller uenig	Litt enig	Enig
Jeg tilbyr barna favorittmaten deres dersom de lover å oppføre seg fint	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Hvis jeg ikke passet på eller satte noen begrensninger for noen av barnas matinntak, ville de spise for mye av sin favorittmat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Jeg tilbyr barna søtsaker (godteri, is, kjeks etc.) som belønning for god oppførsel	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

	Uenig	Litt uenig	Verken enig eller uenig	Litt enig	Enig
Jeg oppmuntrer barna til å prøve ny mat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Jeg forteller barna at sunn mat smaker godt	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Hvis jeg ikke passet på eller satte noen begrensninger for barnas matinntak, ville de spise for mye usunn mat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Hvis noen av barna sier de ikke er sultne, prøver jeg å overtale de til å spise likevel	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

	Uenig	Litt uenig	Verken enig eller uenig	Litt enig	Enig
Jeg holder tilbake søtsaker/dessert som en reaksjon på dårlig oppførsel	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

	Uenig	Litt uenig	Verken enig eller uenig	Litt enig	Enig
Jeg oppmuntrer barna til å spise variert (mange ulike matvarer og retter)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Hvis noen av barna kun spiser en liten porsjon prøver jeg å få de til å spise mer	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Jeg må forsikre meg om at barna ikke spiser for mye av sin favorittmat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

	Uenig	Litt uenig	Verken enig eller uenig	Litt enig	Enig
Jeg må forsikre meg om at barna ikke spiser for mye søtsaker (godterier, kaker, kjeks etc.)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Jeg er et forbilde for barna ved selv å spise sunn mat.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Jeg prøver å spise sunn mat når jeg er sammen med barna, selv om denne maten ikke er min favorittmat.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Jeg prøver å vise entusiasme når jeg spiser sunn mat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Jeg viser barna at jeg virkelig liker å spise sunn mat	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Når et barn sier, eller på annen måte viser, at han/hun er ferdig med å spise prøver jeg å få barnet til å spise en bit til (eller to-tre matbiter til)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

Nå kommer noen spørsmål om deg selv:

Hvilket kjønn er du?

(1) ❑ Mann

(2) ❑ Kvinne

Hva er din alder?

(1) ❑ Yngre enn 20 år

(2) ❑ 20-25 år

(3) ❑ 26-29 år

(5) ❑ 30-39 år

(6) ❑ 40-49 år

(7) ❑ 50-59 år

(8) ❑ 60-65 år

(9) ❑ Eldre enn 65 år

Hvilken utdannelse har du?
Sett kryss for høyest fullførte utdannelse

(1) ❑ Mindre enn 10 års grunnskole

(2) ❑ Grunnskole

(3) ❑ Videregående skole (inkludert gymnas, yrkesskole, fagbrev)

(4) ❑ Universitet eller høyskole inntil 4 år

(5) ❑ Universitet eller høyskole mer enn 4 år

(6) ❑ Annet

Har du mat og helse som fordypning i din høyskole- eller universitetsutdannelse?

(1) ❑ Ja

(2) ❑ Nei

(3) ❑ Ikke aktuelt (har ikke høyere utdannelse)

Arbeider du heltid eller deltid?

(1) ❑ Heltid (100 prosent)

(2) ❑ Deltid (under 100 prosent)

Tilleggsspørsmål i spørreskjemaet til barnehageansatte i intervensjonsgruppe 1:
Helt til slutt vil vi stille deg noen spørsmål om hvordan du opplevde forskningsprosjektet Barns matmot på din avdeling.

Som en del av Barns matmot har avdelingen din servert varm lunsj tre dager i uken. Nedenfor er noen spørsmål om de varme lunsjrettene.

	I svært stor grad	I stor grad	I hverken liten eller stor grad	I liten grad	Ikke i det hele tatt	Vet ikke/Ikke aktuelt
Hvordan likte du å servere barna de varme lunsjrettene?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Hvordan opplevde du at barna likte å få servert de varme lunsjrettene?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Hvordan opplevde du at foreldrene likte at barna fikk servert de varme lunsjrettene?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Når du tenker tilbake på opplegget med de varme lunsjrettene, det vil si tilberening, servering og inntak av maten, hva opplevde du som det mest positive? Skriv svaret ditt under:

_____
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_____

Hva opplevde du som de største barrierene ved opplegget med de varme lunsjrettene? F.eks tilberedning, servering og inntak av maten. Skriv svaret ditt i skjema under:

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Som en del av Barns matmot har avdelingen hatt tilgang til en internettside med oppskrifter og evalueringsskjemaer.

	Veldig godt	Godt	Ikke særlig godt	Ikke i det hele tatt	Vet ikke/Ikke aktuelt
Hvordan likte du nettsiden som helhet?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Hvordan likte du oppskriftene med tanke på forklaring og bilder?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Hvordan likte du de ferdige rettene med tanke på smak og presentasjon?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

I hvilken grad mener du prosjektet Barns matmot har ført til positiv endring av mat- eller måltidssituasjonen for barnegruppen?

(1) ❑ I svært stor grad

(3) ❑ I stor grad

(4) ❑ I hverken liten eller stor grad

(5) ❑ I liten grad

(6) ❑ Ikke i det hele tatt

(7) ❑ Vet ikke/Ikke aktuelt

I hvilken grad mener du at prosjektet Barns matmot har ført til positiv endring av mat- eller måltidssituasjoner for deg selv eller hos andre i familien din?

(1) ❑ I svært stor grad

(3) ❑ I stor grad

(4) ❑ I hverken liten eller stor grad

(5) ❑ I liten grad

(6) ❑ Ikke i det hele tatt

(7) ❑ Vet ikke/Ikke aktuelt

Alt i alt, hva synes du om prosjektet Barns matmot på din avdeling?

(1) ❑ Jeg likte det veldig godt

(2) ❑ Jeg likte det godt

(3) ❑ Jeg likte det ikke særlig godt

(4) ❑ Jeg likte det ikke i det hele tatt

(5) ❑ Ikke aktuelt

Dersom du har ytterligere kommentarer til prosjektet kan du skrive her:

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Tilleggsspørsmål i spørreskjemaet til barnehageansatte i intervensjonsgruppe 2:
Helt til slutt vil vi stille deg noen spørsmål om hvordan du opplevde forskningsprosjektet Barns matmot på din avdeling.

Som en del av Barns matmot har avdelingen din servert varm lunsj tre dager i uken. Nedenfor er noen spørsmål om de varme lunsjrettene.

	I svært stor grad	I stor grad	I hverken liten eller stor grad	I liten grad	Ikke i det hele tatt	Vet ikke/Ikke aktuelt
Hvordan likte du å servere barna de varme lunsjrettene?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Hvordan opplevde du at barna likte å få servert de varme lunsjrettene?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Hvordan opplevde du at foreldrene likte at barna fikk servert de varme lunsjrettene?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Når du tenker tilbake på opplegget med de varme lunsjrettene, det vil si tilberening, servering og inntak av maten, hva opplevde du som det mest positive? Skriv svaret ditt under:

_____
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_____

Hva opplevde du som de største barrierene ved opplegget med de varme lunsjrettene? F.eks tilberedning, servering og inntak av maten. Skriv svaret ditt i skjema under:

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Som en del av Barns matmot har avdelingen din gjennomført Saperesamlinger.

	I svært stor grad	I stor grad	I hverken liten eller stor grad	I liten grad	Ikke i det hele tatt	Vet ikke/Ikke aktuelt
Hvordan likte du Saperesamlingene?	(1) ☐	(3) ☐	(4) ☐	(5) ☐	(6) ☐	(7) ☐
Hvordan opplevde du at barna likte Saperesamlingene?	(1) ☐	(3) ☐	(4) ☐	(5) ☐	(6) ☐	(7) ☐
Hvordan opplevde du at foreldrene likte Saperesamlingene?	(1) ☐	(3) ☐	(4) ☐	(5) ☐	(6) ☐	(7) ☐

Når du tenker tilbake på Saperesamlingene, hva opplevde du som det mest positive? Skriv svaret ditt under:

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Hva opplevde du som de største barrierene ved å gjennomføre Saperesamlingene? Skriv svaret ditt under:

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_____

Som en del av Barns matmot har avdelingen hatt tilgang til en internettside med oppskrifter, informasjonsfilmer og evalueringsskjemaer.

	Veldig godt	Godt	Ikke særlig godt	Ikke i det hele tatt	Vet ikke/ikke aktuelt
Hvordan likte du nettsiden som helhet?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Hvordan likte du oppskriftene med tanke på forklaring og bilder?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Hvordan likte du de ferdige rettene med tanke på smak og presentasjon?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Hvordan likte du filmene med tanke på design, lyd og bilder?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Hvordan likte du filmene med tanke på budskap/informasjon?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

I hvilken grad mener du prosjektet Barns matmot har ført til positiv endring av mat- eller måltidssituasjonen for barnegruppen?

(1) ❑ I svært stor grad

(3) ❑ I stor grad

(4) ❑ I hverken liten eller stor grad

(5) ❑ I liten grad

(6) ❑ Ikke i det hele tatt

(7) ❑ Vet ikke/Ikke aktuelt

I hvilken grad mener du at prosjektet Barns matmot har ført til positiv endring av mat- eller måltidssituasjoner for deg selv eller hos andre i familien din?

(1) ❑ I svært stor grad

(3) ❑ I stor grad

(4) ❑ I hverken liten eller stor grad

(5) ❑ I liten grad

(6) ❑ Ikke i det hele tatt

(7) ❑ Vet ikke/Ikke aktuelt

Alt i alt, hva synes du om prosjektet Barns matmot på din avdeling?

(1) ❑ Jeg likte det veldig godt

(2) ❑ Jeg likte det godt

(3) ❑ Jeg likte det ikke særlig godt

(4) ❑ Jeg likte det ikke i det hele tatt

(5) ❑ Ikke aktuelt

Dersom du har ytterligere kommentarer til prosjektet kan du skrive her:

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Tusen takk for dine svar!

Med vennlig hilsen
Doktorgradsstipendiat Eli Anne Myrvoll Blomkvist
Universitetet i Agder

NSD approval

Eli Anne Myrvoll Blomkvist

Institutt for folkehelse, idrett og ernæring Universitetet i Agder

Serviceboks 422

4604 KRISTIANSAND S

Vår dato: 21.10.2016   Vår ref: 49951 / 3 / ASF   Deres dato: Deres ref:

TILBAKEMELDING PÅ MELDING OM BEHANDLING AV PERSONOPPLYSNINGER

Vi viser til melding om behandling av personopplysninger, mottatt 13.09.2016. Meldingen gjelder prosjektet:

49951	*Barns matmot 2.0. En klyngerandomisert web-basert intervensjonsstudie blant ettåringer i barnehage for å fremme sunne matvaner som støtter optimal kognitiv utvikling og reduserer risiko for overvekt i barnealder*
Behandlingsansvarlig	*Universitetet i Agder, ved institusjonens øverste leder*
Daglig ansvarlig	*Eli Anne Myrvoll Blomkvist*

Personvernombudet har vurdert prosjektet, og finner at behandlingen av personopplysninger vil være regulert av § 7-27 i personopplysningsforskriften. Personvernombudet tilrår at prosjektet gjennomføres.

Personvernombudets tilråding forutsetter at prosjektet gjennomføres i tråd med opplysningene gitt i meldeskjemaet, korrespondanse med ombudet, ombudets kommentarer samt personopplysningsloven og helseregisterloven med forskrifter. Behandlingen av personopplysninger kan settes i gang.

Det gjøres oppmerksom på at det skal gis ny melding dersom behandlingen endres i forhold til de opplysninger som ligger til grunn for personvernombudets vurdering. Endringsmeldinger gis via et eget skjema, http://www.nsd.uib.no/personvern/meldeplikt/skjema.html. Det skal også gis melding etter tre år dersom prosjektet fortsatt pågår. Meldinger skal skje skriftlig til ombudet.

Personvernombudet har lagt ut opplysninger om prosjektet i en offentlig database, http://pvo.nsd.no/prosjekt.

Personvernombudet vil ved prosjektets avslutning, 01.08.2019, rette en henvendelse angående status for behandlingen av personopplysninger.

Vennlig hilsen

Kjersti Haugstvedt

Amalie Statland Fantoft

Kontaktperson: Amalie Statland Fantoft tlf: 55 58 36 41

Dokumentet er elektronisk produsert og godkjent ved NSDs rutiner for elektronisk godkjenning.

Vedlegg: Prosjektvurdering

Personvernombudet for forskning

Prosjektvurdering - Kommentar

FORMÅL
Målet med studien er å utvikle og måle effekten av to ulike tiltak i barnehagen som evalueres mot en kontrollgruppe. Tiltakene har til hensikt å fremme gode matvaner blant små barn, for å legge til rette for god kognitiv utvikling og samtidig redusere risiko for overvekt.

UTVALG
Utvalget består av ettåringer i barnehage og deres foreldre, samt barnehageansatte. Totalt vil det omtrentlig inngå 300 barn og deres foreldre. Antall barnehageansatte avhenger av størrelsen på barnehageavdelingene som blir med i studien.

Barnehagene, ved styrer, blir invitert til deltakelse via brev og telefon. Styrerne henvises til en nettside med informasjon hvor de gir samtykke til å delta. Barnehager som takker ja sender videre invitasjoner til foreldre og til personalet på småbarnsavdelinger. Foreldre og personal vil bli henvist til en nettside hvor de aktivt må avgi samtykke til å delta. Her mottar også foreldrene utfyllende informasjon om studien.

Deltakerne i studien informeres skriftlig og muntlig om prosjektet og samtykke til deltakelse. Informasjonsskrivene er godt utformet.

METODE
Dette er en klynge-randomisert studie hvor barnehager randomiseres til to ulike intervensjonsgrupper eller en kontrollgruppe.

- Tiltaksgruppe 1: Barnehageansatte lager og serverer mat i forhold til en gitt ukesmeny. Barnehagen vil få tilgang til nødvendig informasjon på en egen nettside.
- Tiltaksgruppe 2: Barnehageansatte lager og serverer mat i forhold til en gitt ukesmeny. I tillegg blir tiltaksgruppe 2 bedt om å gjennomføre konkrete tiltak for å stimulere barna til et variert kosthold. Barnehagen og foreldre i denne gruppen vil få tilgang til nødvendig informasjon på en egen nettside.
- Kontrollgruppe: Kontrollgruppen skal fortsette sin vanlige måltidspraksis og ikke gjøre noen endringer. Kontrollgruppen har en viktig funksjon fordi effekten av tiltaket måles ved å sammenlikne resultatet fra tiltaksgruppen med kontrollgruppen.

I tillegg skal utvalget besvare elektroniske spørreskjema. Barnehagestyrere skal svare på spørsmål knyttet til barnehagens mattilbud, og rammer knyttet til mat og måltid. Barnehageansatte skal svare på spørsmål angående måltidspraksis i barnehagen. Ansatte skal ikke besvare noen spørsmål om enkeltbarn. Foreldrene skal besvare et spørreskjema om egen og barnets mat- og spiseatferd, samt om barnets utvikling. Spørreskjemaene skal besvares før og etter intervensjonen.

SENSITIVE PERSONOPPLYSNINGER

Det behandles sensitive personopplysninger om etnisk bakgrunn og helseforhold.

KOMPENSASJON

Barnehagene som skal delta i prosjektet mottar følgende kompensasjon:

- Tiltaksbarnehagene: Mottar økonomiske ressurser slik at tiltaket kan gjennomføres uten at det går på bekostning av noe annet. Videre blir barnehagene subsidiert med 15 kr dagen per barn fordi avdelingen selv må stå for å lage maten.

- Kontrollbarnehagene vil ved prosjektets slutt motta gavekort på 3000 kr til kjøkkenutstyr.

Vi anser dette som kompensasjon for å delta i prosjektet, og mener at det ikke vil påvirke frivilligheten til deltakelse i prosjektet.

INFORMASJONSSIKKERHET

Personvernombudet legger til grunn at dere behandler alle data og personopplysninger i tråd med Universitetet i Agder sine retningslinjer for innsamling og videre behandling av forskningsdata og personopplysninger.

DATABEHANDLER

I meldeskjemaet har dere opplyst at dere skal ta i bruk den eksterne surveytjenesten SurveyXact og Rambøll. Vi legger derfor til grunn at foreligger en databehandleravtale. For råd om hva databehandleravtalen bør inneholde, se Datatilsynets veileder: http://www.datatilsynet.no/Sikkerhet-internkontroll/Databehandleravtale/.

PROSJEKTSLUTT OG ANONYMISERING

Forventet prosjektslutt er 01.08.2019. Ifølge prosjektmeldingen skal innsamlede opplysninger da oppbevares med personidentifikasjon til 01.08.2021 for oppfølgingsstudier. Utvalget er informert om at de kan bli kontaktet igjen dersom det blir aktuelt med oppfølgingsstudier.

Vi minner om at eventuelle nye studier må meldes til personvernombudet.

NSD change notifications and approvals

Endringsskjema

for endringer i forsknings- og studentprosjekt som medfører meldeplikt eller konsesjonsplikt

(jf. personopplysningsloven og helseregisterloven med forskrifter)

Endringsskjema sendes per e-post til: personvernombudet@nsd.no

1. PROSJEKT	
Navn på daglig ansvarlig: Eli Anne Myrvoll Blomkvist	Prosjektnummer: 49951
Evt. navn på student:	

2. BESKRIV ENDRING(ENE)	
Endring av daglig ansvarlig/veileder:	*Ved bytte av daglig ansvarlig må bekreftelse fra tidligere og ny daglig ansvarlig vedlegges. Dersom vedkommende har sluttet ved institusjonen, må bekreftelse fra representant på minimum instituttnivå vedlegges.*
Endring av dato for anonymisering av datamaterialet:	*Ved forlengelse på mer enn ett år utover det deltakerne er informert om, skal det fortrinnsvis gis ny informasjon til deltakerne.*
Gis det ny informasjon til utvalget? Ja: ____ Nei: ____ Hvis nei, begrunn:	
Endring av metode(r):	*Angi hvilke nye metoder som skal benyttes, f.eks. intervju, spørreskjema, observasjon, registerdata, osv.*
Endring av utvalg:	*Dersom det er snakk om små endringer i antall deltakere er endringsmelding som regel ikke nødvendig. Ta kontakt på telefon før du sender inn skjema dersom du er i tvil.*
Annet:	

3. TILLEGGSOPPLYSNINGER
Underveis i planleggingen med webutviklerne som skal lage Webside til prosjektet ser vi at det er hensiktsmessig å endre ordlyden i informasjonsbrevene. Vi har nå samlet informasjonen til foreldrene i ett og samme informasjonsbrev som alle foreldre får før de underskriver samtykke til å delta i studien. Ordlyden i informasjonsbrev til styrer er også noe endret. Vi har blant annet redusert kompensasjonen til kontrollbarnehagene fra 3000 kroner til 2000 kroner. Det er ikke gjort noen endringer i selve studien med tanke på metoder, innhenting/behandling av personopplysninger eller annet.

4. ANTALL VEDLEGG	
Informasjonsbrev til styrer Informasjonsbrev til foreldre Informasjonsbrev til pedagogisk leder	*Legg ved eventuelle nye vedlegg (informasjonsskriv, intervjuguide, spørreskjema, tillatelser, og liknende.)*

Har du spørsmål i forbindelse med utfylling av skjemaet, ta gjerne kontakt med Personvernombudet hos NSD, telefon 55 58 81 80

Fra: Lene Brandt <lene.brandt@nsd.no>
Sendt: fredag 17. mars 2017 11.31
Til: Eli Anne Myrvoll Blomkvist
Emne: Prosjektnr: 49951. Barns matmot 2.0. En klyngerandomisert web-basert intervensjonsstudie blant ettåringer i barnehage for å fremme sunne matvaner som støtter optimal kognitiv utvikling og reduserer risiko for overvekt i barnealder

Hei,

Vi viser til epost mottatt 28.02.2017. Vi registrerer å ha mottatt de oppdaterte informasjonsskrivene. Skrivene er godt utformet.
--
Vennlig hilsen,

Lene Christine M. Brandt
Rådgiver | Adviser
Seksjon for personverntjenester | Data Protection Services
T: (+47) 55 58 89 26

NSD – Norsk senter for forskningsdata AS | NSD – Norwegian Centre for Research Data
Harald Hårfagres gate 29, NO-5007 Bergen
T: (+47) 55 58 21 17
postmottak@nsd.no   www.nsd.no

Endringsskjema

for endringer i forsknings- og studentprosjekt som medfører meldeplikt eller konsesjonsplikt

(jf. personopplysningsloven og helseregisterloven med forskrifter)

Endringsskjema sendes per e-post til: personvernombudet@nsd.no

1. PROSJEKT	
Navn på daglig ansvarlig: Eli Anne Myrvoll Blomkvist	Prosjektnummer: 49951
Evt. navn på student:	

2. BESKRIV ENDRING(ENE)	
Endring av daglig ansvarlig/veileder:	*Ved bytte av daglig ansvarlig må bekreftelse fra tidligere og ny daglig ansvarlig vedlegges. Dersom vedkommende har sluttet ved institusjonen, må bekreftelse fra representant på minimum instituttnivå vedlegges.*
Endring av dato for anonymisering av datamaterialet:	*Ved forlengelse på mer enn ett år utover det deltakerne er informert om, skal det fortrinnsvis gis ny informasjon til deltakerne.*
Gis det ny informasjon til utvalget? Ja: _____ Nei: _____ Hvis nei, begrunn:	
Endring av metode(r): Gjennomføre telefonintervju med fem barnehageansatte som har deltatt i prosjektet.	*Angi hvilke nye metoder som skal benyttes, f.eks. intervju, spørreskjema, observasjon, registerdata, osv.*
Endring av utvalg:	*Dersom det er snakk om små endringer i antall deltakere er endringsmelding som regel ikke nødvendig. Ta kontakt på telefon før du sender inn skjema dersom du er i tvil.*
Annet:	

3. TILLEGGSOPPLYSNINGER

4. ANTALL VEDLEGG	
	Legg ved eventuelle nye vedlegg (informasjonsskriv, intervjuguide, spørreskjema, tillatelser, og liknende.)

Har du spørsmål i forbindelse med utfylling av skjemaet, ta gjerne kontakt med Personvernombudet hos NSD, telefon 55 58 81 80

Fra: Lasse Andre Raa <Lasse.Raa@nsd.no>
Sendt: torsdag 11. januar 2018 09.32
Til: Eli Anne Myrvoll Blomkvist
Emne: Prosjektnr: 49951. Barns matmot 2.0. En klyngerandomisert web-basert intervensjonsstudie blant ettåringer i barnehage for å fremme sunne matvaner som støtter optimal kognitiv utvikling og reduserer risiko for overvekt i barnealder

Hei.

Viser til innsendt endringsskjema for prosjektnr. 49951.

Vi forstår det slik at det skal gjennomføres intervjuer med barnehageansatte, og at disse allerede har fått informasjon om prosjektet. Vi legger til grunn at det innhentes samtykke (muntlig eller skriftlig) også til deltakelse i intervjuer.

Vi ber om å få tilsendt intervjuguide eller temaliste, slik at vi kan vurdere omfanget av personopplysninger som registreres i intervjuene.

Hører fra deg.

Med vennlig hilsen

Lasse André Raa
Rådgiver | Adviser
Seksjon for personverntjenester | Data Protection Official
T: (+47) 55 58 20 59

NSD - Norsk senter for forskningsdata AS | NSD - Norwegian Centre for Research Data Harald Hårfagres
gate 29, NO-5007 Bergen
T: (+47) 55 58 21 17
postmottak@nsd.no   www.nsd.no