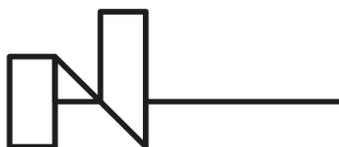


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Healthy lifestyle of children and youth

Project report



Norway
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Healthy lifestyle of children and youth – Module 1: Diet and physical activity: Measures to improve diet and increase the degree of physical activity in kindergarten children (1-6 years old)

A collaboration between
The Polish Ministry of Health
The Healthy Life Central in Verdal, Norway
&
Nord University, Norway

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Preamble

In 2019, Norway signed a new cooperation agreement with Poland on a new Programme under the Norwegian Financial Mechanism 2014-2021. The Polish Health Programme called "Improved prevention and reduced inequalities in health" has a total budget of 23,529,412 euros. The Programme consists of one open call and two pre-defined projects on e-health and telemedicine and on healthy lifestyle of children and youth. The Polish Ministry of Health is the Programme Operator, responsible for developing and implementing the Programme. The Norwegian Directorate of Health is the Donor Programme Partner, responsible for advising the Programme Operator and the donor through the development and implementation of the Programme.

The project "Healthy lifestyle of children and youth" has three separate parts with a total budget of 5 million euros. The Polish Ministry of Health is the Project Promoter, whilst Verdal Healthy Life Centre and the Norwegian Cancer Society are the Donor Project Partners. This report is one of the deliverables of this project, under module 1 in the field of nutrition and sport.

The Polish health care sector faces several challenges at different levels. Public health awareness is limited, so efforts are needed to inform the Poles, especially children and youth, their parents, teachers and caregivers, about the importance of positive health choices to prevent disease and promote well-being.

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Glossary

Nutrition: In this report, we use nutrition for the link between food, nutrients and human health.

Diet: In this report, we use diet for the total intake of food and drink a person consumes over a certain period of time, e.g. a week, a month or a year.

Physical activity: All bodily movement initiated by skeletal muscles resulting in a significant increase in energy expenditure beyond rest levels.

Training: Physical activity that is planned, structured and repeated and has the aim of improving or maintaining physical fitness – be it health-related fitness or athletic performance. In this report, we use "physical activity" as the overarching term, because children's activity is often spontaneous and play based.

Preventive and health promotion work: It is common to distinguish between preventive and health promotion work. Preventive work consists of reducing the factors that threaten people's health, that is, measures aimed at reducing disease, injury, social problems, mortality, or risk factors.

Health promotion work is aimed at ensuring the supply of factors that produce excess and enjoyment in people's everyday lives. In health promotion work, the focus is on factors that can give the population increased control over and opportunities to improve their own health. Health promotion measures therefore focus on the individual's resources, social functioning and the ability to make good health choices.

In this report we mainly focus on preventive measures, although some of the measures also aim to strengthen individuals' ability to make good health choices. A healthy and varied diet and adequate physical activity can also be health-promoting, as they can produce excess and improve the quality of life of the population.

“Best practice”: As a starting point, it makes sense to rely on existing frameworks and definitions when describing and defining concepts. The EU has developed a comprehensive framework that defines the term "best practice", as well as a selection of criteria for selecting "best practice" measures in preventive health care.¹ In this report, however, we consider it inappropriate to use this framework, because many promising and potentially good measures

¹ EU's framework and criteria for selecting “best practice” measures, are here:

https://ec.europa.eu/health/sites/health/files/major_chronic_diseases/docs/sgpp_bestpracticescriteria_en.pdf

that may have good effect could nevertheless be excluded because they do not meet *all* the criteria.

We have therefore chosen to use the term "best practice" for measures selected on the basis of predetermined inclusion and exclusion criteria (cf. Appendix 1), and define this as follows:

“Best practice” means all measures that meet target group requirements; which are aimed at diet and/or physical activity; which are or have been implemented in a Norwegian setting; which have either been evaluated or followed up, or which have been shown to have promising potential in the field of diet and/or physical activity in kindergarten children.

By "promising potential", we mean that experiences from practice (experience-based knowledge), practice-based knowledge or professional judgment indicate that the initiative is considered likely to lead to better diet in kindergarten children and/or increase the degree of physical activity in kindergarten children.

Introduction

The aim of this report

This report is part of the "Healthy lifestyle of children and youth" project. The report forms the first part of Module 1 and will be used as a knowledge base in the subsequent parts of the project.

The theme of the report is diet and physical activity in kindergarten children, aged 1-6 years. The report has been commissioned by the Polish Ministry of Health and will form the basis for measures to be taken in Poland, to improve the diet and level of physical activity for Polish kindergarten children.

In the report we will describe "best practice" measures that either improve the diet or the level of physical activity in kindergarten children, defined as the age group 1-6 years. The setting for the measures can be in kindergarten, at home, at various leisure venues or online initiatives.

The target groups for the measures are the children themselves; their parents or guardians (for children 1-6 years); staff in the kindergarten, sports coaches and/or other caregivers for children of kindergarten age. The measures will have been tried out on the equivalent target groups in Norway. They should occur at national, regional or local action levels. The measures will further promote good health habits for kindergarten children in the areas of diet and physical activity.

In the report we have chosen to describe some key characteristics of the Norwegian kindergarten sector in order to put the measures into a context and provide background information. In addition, we briefly describe the status of diet and physical activity for children aged 1-6 years, before the measures are presented.

Characteristics of Norwegian kindergartens

In Norway, there are both public and private kindergartens. Regardless of ownership, the Kindergarten Act, 2005, and the Framework Plan for Kindergartens regulate the activities of kindergartens (Directorate of Education, 2017).

According to the Kindergarten Act, all kindergartens, in cooperation and understanding with the child's home, must protect the child's need for care and play, and promote learning as a basis for all-round development. The kindergarten shall build on fundamental values of Christian and humanist heritage and tradition, such as respect for human dignity and nature, intellectual freedom, charity, forgiveness, equality and solidarity, values expressed in different religions and beliefs and that are rooted in human rights.

A characteristic of the Nordic kindergarten model is that it emphasises a holistic and integrated pedagogy where play, care, learning and education are protected. The kindergarten shall also have a holistic approach to children's development (Directorate of Education, 2017). The Kindergarten Act further states that kindergartens should meet children with confidence and respect and recognize the intrinsic value of childhood. The kindergarten will contribute to well-being and the enjoyment of play and learning and be a challenging and safe place for fellowship and friendship. The kindergarten shall promote democracy and equality and oppose all forms of discrimination (Kindergarten Act, 2005, §1). In addition, the kindergarten shall have a health promotion and a preventive function and contribute to reducing social inequalities (Kindergarten Act, 2005, §2).

In Norway, all children are entitled to a kindergarten place from the age of 1. This is a consequence of the Kindergarten Act. The running costs of Norwegian kindergartens are subsidised, and the parliament has, since 2009, set a maximum price, which from January 2021 is NOK 3230 per month (Directorate of Education, 2020a). This corresponds to approx. €320 a month. The maximum price applies to all types of kindergartens, regardless of whether they are public or private. Municipalities can choose to offer parents a lower price. In addition, kindergartens can charge for food. Norway is among the countries in Europe where parents pay the least for kindergarten, relative to the average income level (Yoopies, 2019).

In addition, parents have the right to sibling moderation (reduction in parental payment) if they have more than one child in kindergarten in the same municipality. Parents on a low income also have the right to reduce the maximum price. The Government's goal is for kindergartens to be accessible to all children, regardless of their parents' finances (Government, 2020). The municipalities finance the kindergarten grants, and they provide this to approved private, county and state kindergartens. Kindergartens must be treated equally when awarding grants.

As a result of effective extension of the kindergarten sector, high levels of occupational participation in both sexes and relatively low costs for parents, the vast majority of Norwegian children attend kindergarten. 92 % of Norwegian children between 1 and 5 years old went to kindergarten in 2019 (Directorate of Education, 2020b). Since parents are entitled to parental leave for a total of 12 months in connection with childbirth in Norway (Norwegian Labour Inspection Authority, n.d.), most children first start kindergarten when they are around one year old. There are hardly any children under the age of 1 who attend kindergarten, while around 75% of one-year-olds had a kindergarten place in 2019. For children between 2 and 5 years, the proportion of children attending kindergarten varies from 93.6% to 97.5% (Directorate of Education, 2020b).

A total of 97 per cent of children who attend kindergarten have a full-time place. Full-time place means agreed stay of at least 41 hours a week (Directorate of Education, 2020b). Most Norwegian kindergartens are open around 10 hours per day, from 7 in the morning to 16.30 or 17 in the afternoon. Normal working hours in Norway are 37.5 hours per week, so only a very few children spend as much as 10 hours in kindergarten daily.

In 2018, the parliament adopted a staffing standard for Norwegian kindergartens. It requires kindergartens to have a basic staffing equivalent to at least one employee per three children under three years of age and one employee per six children over three years of age. In addition, the regulation on educational staffing states that there should be at least one educational leader per 7 children under the age of three, and at least one educational leader per 14 children over three years (Directorate of Education, 2020c).

Diet for kindergarten children

As mentioned, around 9 out of 10 Norwegian children between 1 and 5 years of age attend kindergarten (Directorate of Education, 2020b). In kindergarten, the children eat up to three meals a day, five days a week. The food can consist of packed lunches/meals from home, the kindergarten offering full meals (up to three meals served, where one of the meals is hot food), or a combination thereof. Many kindergartens offer milk and fruit but rely on children bringing packed meals from home. This varies from kindergarten to kindergarten. During the years Norwegian children spend in kindergarten, they eat between 3000 and 4000 meals in kindergarten (The Norwegian Diet and Nutrition Association & the Norwegian Consumer Council, 2018). This accounts for between 40 and 60% of children's daily energy intake. Kindergarten food thus forms an important part of the children's total diet (Directorate of Health, 2018a).

The Directorate of Health has prepared a national guideline for food and meals in kindergarten. The guideline is designed as 12 short and specific points, with supplementary information for each point. The guideline emphasizes regular meals, serving a variety of food, fruit and vegetables every day, and taking pleasure in food and meals. It is based on current recommendations for nutrition. Among other things, the guideline emphasizes that meals served in kindergarten should be in line with national dietary advice. Figure 1 provides an overview of the advice in the guideline. The national guideline is normative and provides the recommended actions for food and meal activities in kindergarten.



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|---|---|
| <ol style="list-style-type: none"> 1. Barnehagen bør legge til rette for minst tre faste måltider om dagen, med medbrakt eller servert mat 2. Barna i barnehagen bør få god tid til å spise, minst 30 minutter 3. Mat og måltider som serveres i barnehagen bør være varierte og i tråd med Helsedirektoratets kostråd 4. Barnehagen bør servere grønnsaker og frukt eller bær hver dag 5. Barna bør få tilbud om lett- eller skummet melk og vann til måltidene i barnehagen, og vann bør alltid være tilgjengelig 6. Servering av kaker, kjeks, is, saft og liknende bør begrenses i barnehagen. Godteri, snacks og brus bør unngås | <ol style="list-style-type: none"> 7. Spisemiljøet i barnehagen skal fremme helse, mat- og måltids glede, og personalet bør delta aktivt i måltidet 8. Måltidene i barnehagen skal være en pedagogisk arena der barna får medvirke i mat- og måltidsaktiviteter 9. Det skal legges til rette for god håndhygiene i barnehagen, og håndvask bør gjennomføres før måltidene 10. Maten i barnehagen skal være lagret, tilberedt, servert og merket i samsvar med regelverk og råd fra Mattilsynet 11. Barnehagen skal ta hensyn til barn som har særlige behov knyttet til mat og måltider 12. Barnehagen bør ha en miljøvennlig praksis med lite matsvinn og et mattilbud hvor plantebaserte matvarer og fisk og sjømat er sentralt |
|---|---|

Figure 1. Overview of the points in the national guideline for food and mealtimes in kindergarten (Directorate of Health, 2018a).

National surveys of small children's diets have shown that low consumption of vegetables and fish has long been a challenge, along with high intake of sugary drinks (Øverby & Hillesund, 2019). However, the latest dietary surveys conducted among babies and small children in Norway show a positive development: there has been a clear decrease in the intake of added sugar over the past decade, as for the rest of the population. Children also eat more vegetables, fruit and berries than before (Norwegian Institute of Public Health, 2020). However, the intake of saturated fat is still a little high. For 2-year-olds, the latest dietary survey also shows that their fish intake was lower than recommended, but that it had increased since 2007 – from 25 to 33 g/day (Astrup, Myhre, Andersen & Kristiansen, 2020).

The most recent national dietary survey conducted among Norwegian four-year-olds also found that these children, to a large extent, had a diet in line with dietary advice, but they ate too little fruit and vegetables and too much saturated fat. Sources of saturated fats were meat products such as sausages and minced meat, and fatty dairy products such as butter and

cheese (Norwegian Institute of Public Health, 2017). The average fish intake for 4-year-olds was also somewhat low; around 30 g/day (Hansen, Myhre & Andersen, 2017).

When children are offered food in kindergarten, all the children are given the same food, regardless of their parents' socio-economic situation or their financial resources.

Kindergartens therefore have a unique opportunity to help reduce social inequalities in health, if they offer healthy, nutritious and varied food and follow the guidelines for food and meals and national dietary advice.

Several studies have looked at the stability of children's diets over time and find that eating habits established in childhood tend to carry on into adulthood (Craigie et al., 2011; Mikkilä et al., 2005). This emphasises the role of kindergartens as a central arena for establishing children's food and meal practices and shows that they form an important part of a country's public health work.

Along with the kindergarten and staff, home is another important setting that shapes children's diet, and their food and meal habits. When children are at home, it is mainly the parents who decide what kind of food the children eat through the food the parents buy, cook and serve to the children. The availability of various foods, price, location of food in the shop, food labelling and portion sizes often control the kind of food adults buy (Karevold et al., 2017).

According to Wansink and Sobal (2007), adults make more than 200 food choices every day. Many of these choices are made quickly and impulsively (Karevold et al. 2017), and as a rule, we tend to choose what we normally do; we follow our habits. Adults' food choices can therefore be largely influenced by the development and implementation of policies and measures at the system level (Torheim et al., 2020,p. III), such as differentiated taxes/subsidies on healthy and unhealthy foods (WHO, 2017). Any measure that affects which foods parents buy and eat themselves will be beneficial both in influencing parents as role models and affecting the availability of healthy foods at home – factors that have been shown to vary with parents' socio-economic status (Zarnowiecki, Dollman & Parletta, 2014).

Physical activity in children of kindergarten age

Steene-Johannessen et al (2019) found in the ungKan3 study² that 94 % of 6-year-old boys and 87 % of 6-year-old girls met the recommendations of at least 60 minutes moderate to high intensity physical activity every day. The Norwegian recommendations on physical activity were based on joint Nordic recommendations (Nordic Council of Ministers, 2014). The Norwegian Directorate of Health (2014) recommends that children and young people should be physically active for a minimum of 60 minutes each day at moderate or high intensity. The children who participated in the ungKan3 study were in first grade in elementary school when their activity level was measured.

Despite many children achieving the recommendations for physical activity, some children of kindergarten age are not physically active enough. Several Norwegian studies show that children of kindergarten age have too little physical activity while in kindergarten (Andersen et al., 2017; Danielsen, Mathisen & Stålesen, 2019; Giske, Tjensvoll & Dyrstad, 2010; Nilsen, Andersen, Ylvisaaker, Johannesen & Aadland, 2019a). In addition, a study by Kippe and Lagestad (2018) shows that children who were not physically active in kindergarten were not physically active in their spare time either. The kindergarten is therefore of significance for children's total physical activity. This is supported by Fossdal, Kippe, Handegaard and Lagestad (2018), who found that the kindergarten contributed 64% of children's total physical activity, while Nilsen and several (2019b) found that the kindergarten contributed 77% of children's total physical activity. Since such a large proportion of Norwegian children attend kindergarten, this is an important place where children's health, both in the short and long term, can be influenced. The kindergarten can also contribute to reducing social inequalities in physical activity, if measures are put in place that also reach those who are initially not physically active.

Previous Norwegian research shows that key factors which can contribute to increased physical activity for 4-6-year-olds are time, space and area, equipment, furnishing, facilitation, organisation and the role of staff. Norwegian studies show that children are more physically active outside than inside (Andersen et al., 2017; Giske et al., 2010). Furthermore,

² ungKan3 was a national survey of physical activity, in which physical activity is objectively measured using accelerometers

the research shows that working with the physical environment in kindergarten, through developing good play zones both inside and outside, and by adding enough materials and a diversity of materials, strengthens children's opportunities for physically active play (Sandseter & Storli, 2020). Storli and Sandseter (2019) argue that factors other than the physical environment create more physical activity outside. Culture, daily routines and organisation, as well as employee knowledge, perceptions and attitudes will be essential for children to use the opportunities the physical environment provides for physical activity. This is supported by Sando (2019), who argues that open spaces outside need equipment, active staff or other children to play with to stimulate physical activity. Inside, multi-use furnishing can contribute to increased physical activity and furniture can be moved to provide new opportunities for physically active play.

Facilitated and organised physical activity also increases children's physical activity rates (Dønnestad et al., 2015). This is supported by Bjørgen and Svendsen (2015), who claim that if staff enjoy the activity, this creates motivation in the children. An enthusiastic employee who starts, goes first and is passionate about the activity is key to stimulating motivation and desire (Bjørgen & Svendsen, 2015).

Method

To find initiatives that have been implemented in Norway and that have been evaluated, a specialist librarian conducted literature searches for this sub-project. The MEDLINE, NORART and ERIC databases were searched on 17 January 2021. Details of the search strategy and keyword details can be found in Appendix 2. In addition, a search was carried out in CRISTIN³ on 15 January 2021. Inclusion and exclusion criteria for selecting best practice measures in the areas of improvement of diet and physical activity in Norway, for children of kindergarten age (1-6 years), are included as Appendix 1 to this report.

It is worth noting that the measures can be either in kindergarten or elsewhere, as long as the measure or measures were aimed either at the children themselves, employees in kindergarten, parents/guardians of children 1-6 years, and/or coaches in sports teams etc., where the target group is children of kindergarten age – and where the purpose of the measure was to improve the diet or the level of physical activity in kindergarten children aged 1-6 years.

Both traditional "physical" measures, and digital measures were included in the search and in the review of articles. To be included in the final presentation, measures had to be implemented in Norway at national, regional or local level.

The literature search yielded a total of 264 hits, limited to articles published after the year 2000. We also searched EMBASE but found no relevant articles there. After eliminating all irrelevant matches according to the exclusion criteria given in Appendix 1, we were left with seven articles for three different evaluated measures to improve diet in kindergarten children. Five of these related to the same study. One measure had parents as the target group, while the others had both kindergarten children and employees as the target groups. All measures are presented in more detail in the results chapter.

³ CRISTIN (Current Research Information System in Norway) is a national research information system with the aim of collecting and making openly available information about all research conducted at all Norwegian institutions within the university and college sectors. CRISTIN covers all Norwegian universities and colleges, the health sector and the research institute sector.

On 28 February 2021, we conducted a supplementary search in Medline for initiatives to improve diet specifically aimed at parents/guardians of children 1-6 years of age, based on feedback we received from the client on the module's midway report. The search strategy for this search is in Appendix 3. This search resulted in 175 hits. After eliminating all irrelevant hits according to the exclusion criteria in Appendix 1, we were left with three hits, all on parent-focused e-health measures. These are presented in more detail in the results chapter.

The initiatives presented for physical activity were mainly chosen on the basis of how closely they were linked to the academic environments that carried out research on the effect, i.e. the extent to which the measures were evaluated. Measures that have proven to be in demand, such as the videos in the project "Active and Happy", are included in the report because they have promising potential.

In addition, we contacted several different networks for employees working on, researching or teaching about diet and/or physical activity in the kindergarten sector to identify measures that had not been evaluated or published in scientific articles. In selecting measures for this category, we applied the definition of "promising potential"; where experience from practice, experience-based knowledge or professional judgment suggested the measure was likely to lead to a better diet and/or increase the level of physical activity in kindergarten children. The following networks were contacted and received a written message describing the type of measures we wanted information about:

- National Network for Physical Nurture in Kindergarten Teacher Training (NNFF)
- Network for Employees in Kindergarten Teacher Training who teach about food and meals
- Network for Food and Health Teachers in the University and Higher Education sector

The feedback we received from these networks has been used in the presentation in the results section of this report.

Results

In this chapter we present the best practice measures, which aim to improve the diet and/or degree of physical activity in kindergarten children. The measures presented here are based on the literature searches described in the method chapter, a review of "grey literature", and on information we received from our professional networks about possible "best-practice" measures that have improved the diet and/or degree of physical activity in kindergarten children.

We have also chosen to include some experience-based knowledge and research findings related to various barriers that can prevent the effective implementation of such measures, and possible strategies to overcome them.

The client has expressed a wish for initiatives in the following areas to be included:

1. Role play and theatre performances or art workshops to promote a healthy lifestyle
2. Food preparation courses for children and their families
3. Sports activities
4. Educational toys or games/apps
5. Education/information for caregivers about healthy lifestyles
6. Buying in equipment

For role-play/theatre performances and art workshops, we found no relevant measures through the literature search. We found no studies about apps or games developed and evaluated for kindergarten children and their parents, which focused on diet/physical activity for the target group. Nor did we find any measures aimed at sports coaches for children aged 1-6 years, but one can assume that coaches might benefit from the same type of information as kindergarten staff and parents/guardians. For the other categories, various measures are presented below.

For sports coaches, it may be useful to know that the nutrition department at Olympiatoppen in Norway has developed 18 fact sheets on sports nutrition in cooperation with Tine.⁴ Topics for the fact sheets include: food at sports events; facts about food and drink before, during and after exercise; meal patterns and food choices; use of dietary supplements; protein and exercise; carbohydrates and exercise; fluid balance, bone health, etc. (Olympiatoppen, n.d.). The fact sheets are based on national dietary advice and other research-based knowledge. They can also be used in work with younger children. The nutrition department at Olympiatoppen (2013) has also developed a teaching programme for young athletes, which is based on the same principles as the fact sheets. The programme consists of a PowerPoint presentation and a manual for teachers/coaches. The target group for this teaching programme is somewhat older children and adolescents, but the scheme can still be used by coaches for younger children.

Measures to improve diet in kindergarten children

Information material, dietary advice and recommendations from national health authorities

Owner/provider: Directorate of Health / Food Safety Authority / Institute of Public Health.

Geographical level: National. The measure consists of dietary advice, guidelines for food and meals in kindergarten, information materials and recommendations from the health authorities. All materials are available digitally. The use of the advice is voluntary, while the guidelines for food and meals in kindergarten are professionally normative.

Purpose/aim: Inform about diet; make recommendations. Help to increase knowledge in the population about food, diet and health; reach the entire population with clear, easy-to-understand, linguistically facilitated and unified information on diet and nutrition.

Target groups: The general population; parents/guardians; kindergarten staff; sports coaches and others working with children.

Time period: Not given/various.

⁴ Tine is a Norwegian cooperative food group, where the core business is the production and sale of milk, cheese and other dairy products.

Organisation/implementation: The information material consists, among other things, of the Directorate of Health's Dietary Advice (Directorate of Health, 2015), national, professional guidelines for food and meals in kindergarten (Directorate of Health, 2018a) and information on food and meals on the website Helsenorge.⁵ Under the "diet for children and young people" tab on the Helsenorge.no website, parents and kindergarten staff can find information about diet for children between the ages of 2 and 5, tips for children's packed lunches and more (Helsenorge, 2020). On Helsenorge.no there are also tips on physical activity for children of different ages (0-2 years/ 2-5/ 6-9 years, etc.). This website is aimed at parents (Helsenorge, 2019a).

The Directorate of Health has produced a recipe booklet called "Good Food in Kindergarten – Advice, Tips and Recipes", which is publicly available and can be downloaded for free (Directorate of Health, 2018b).

The food and health authorities in Norway administer the keyhole mark, which is a shared Nordic public labelling scheme for foods containing less fat, less saturated fat, less sugar and salt and more fibre and whole grains. The keyhole mark was introduced in Norway in 2009. The aim of the labelling is to make it easy for the consumer to make healthier choices in store. The use of the labelling scheme is voluntary for the food industry (Helsenorge, 2019b).

The Norwegian Institute of Public Health (2021) has developed a theme page on diet and nutrition, which contains summarised research on diet and nutrition. The food and health authorities have their own themed page, called Matportalen (the Food Portal). Matportalen.no presents consumer-oriented information about healthy and safe food, and physical activity from public authorities. The goal of matportalen.no is to enable consumers to make informed choices. Matportalen.no provides information about food groups; diet and health; food labelling; food infection and hygiene; unwanted substances in food; advice on diet for specific groups and advice on physical activity (Matportalen, 2019).

Cost: All materials are free and openly accessible for everyone.

Effect: Not given.

Evaluation: The measures have not been evaluated, but the authorities measure the population's knowledge of and confidence in dietary advice and the keyhole mark annually. In

⁵ Helsenorge.no is a public, digital information base for the Norwegian population. The content is produced and delivered by various actors within the health sector, and the information is quality-checked and regularly updated. Among the content, there is information about health, lifestyle and disease.

2020, seven out of ten said they had confidence in the dietary advice. Familiarity with the individual parts of dietary advice is also high; three out of four are familiar with dietary advice about fruit and vegetables, fish and about whole grain products. Knowledge of the keyhole mark is consistently high and has been between 96 to 98 per cent between 2012 and 2020. In 2020, the share was 96 per cent. Two out of three think the keyhole mark is a good labelling scheme (Directorate of Health, 2020).

Limitations linked to Covid 19: All material is available digitally.

References: Institute of Public Health, 2021; Directorate of Health, 2015; 2018a and b; Helsenorge, 2019 a and b; Helsenorge, 2020; Matportalen, 2019.

Cooking classes for kindergarten children, kindergarten staff and parents

Owner/provider: Geitmyra Culinary Centre for Children. Geitmyra is a non-commercial foundation run on grants from private and public sources.

Geographical level: There are four local centres at Kristiansand, Oslo, Ringsaker and Trondheim. National for online courses. The initiatives are voluntary for participants.

Purpose/aim: Geitmyra's vision is to help as many children and young people as possible come to love food that is good for them. Geitmyra wants to excite curiosity, cultivate knowledge and increase the joy of food for the children who participate in courses and activities, and help the children learn to make good food choices.

Target groups: Kindergarten children, staff in kindergartens; other adults who work with children; parents; children and families.

Time period: From 2011 to today.

Organisation/implementation: Geitmyra holds courses for kindergartens; courses and hospitality for adults working with children; courses for parents of small infants, cooking classes for children and families and open family events.

Courses for kindergartens: The courses last about 2.5 hours and are called "Superdays for Kindergartens". Different themes: taste, fish and seafood, hiking food for kindergartens. The courses are for children 3-5 years; up to 12 kindergarten children together with employees. Geitmyra also has courses in Early Food Joy for Parents, which focus on making infant food. In January 2021 Geitmyra started the digital course "Early Food Joy", with the theme: How to make good and nutritious food for infants. The course runs via Facebook one hour each week

and is free and openly available to everyone. Geitmyra has also prepared teaching materials used by kindergartens and schools across the country: <https://www.geitmyra.no/verkty>

Cost: Kindergarten courses cost 500-700 kroner per kindergarten group of up to 12 children. Participation in courses for families costs 200-300 kroner per adult, but Geitmyra offers payment exemptions for families with poor finances.

Effect: The efficacy of the measure has not been evaluated. According to Geitmyra's annual report, 1,464 kindergarten children attended courses organised by Geitmyra in 2019, while 8,940 parents and children attended their family events in the same year (Geitmyra, 2020).

Evaluation: Not stated.

Limitations linked to Covid 19: Geitmyra enforces strict infection control rules to ensure that everyone who attends courses with them is kept safe. They keep up to date with infection control advice from national and local health authorities and have reduced the number of participants on their courses to comply with social distancing requirements. They have strict hygiene routines both before and during the course and have the following rules for their course participants: everyone who comes on a course must be healthy; everyone should keep a meter distance apart; there is a focus on hand washing (Geitmyra, 2021). From January 2021, the course "Early Food Joy" was carried out digitally.

References: <https://www.geitmyra.no/barnehage>; <https://www.geitmyra.no/foreldre-og-barn>

Courses on food and food preparation at Healthy Life Centres

Owner/provider: Various Healthy Life Centres in Norway.

Geographical level: National. The initiative is voluntary. In 2019, there were 262 Healthy Life Centres across Norway; 162 of these offered the Good Food course in 2019.

Purpose/aim: "Good Food for Better Health" is an inspirational course for changing eating habits and food choices, based on national dietary advice. The course will motivate, help and support participants to make positive changes in their diet and can be a good start to bring about lasting change. The course "Good Food for Expectant Parents and Toddler Parents" is tailored to those who are expecting or have just become parents and it focuses on the parents' and the child's dietary habits. The course aims to raise awareness of food and food choices, increase motivation to adjust habits, get practical advice on everyday life, increase understanding of food preparations and swap experiences.

Target groups: Good Food Course: for those who need and want to change dietary habits.
The course Good Food for Expectant Parents: expecting or new parents.

Time period: From 2010 to today.

Organisation/implementation: The course "Good Food for Better Health" is based on principles of motivational interview and can be a good start for bringing about lasting improvement in diet. The course is both theoretical and practical and emphasizes dietary change over time. Based on national dietary advice, the course addresses topics such as healthy food choices, five a day, regular meals, portion sizes, labelling, dietary fibre, salt and sugar, types of fat and convenient cooking. The Directorate of Health has developed a course leader booklet: "Good Food for Better Health", PowerPoint presentations, fact sheets, evaluation forms and various tools, to help course leaders deliver the course. The course is divided into five sessions of 2-3 hours, and the number of participants per course should be five to 10 people.

Cost: Contribution of about 500 NOK. for the "Good Food" course. Good Food courses for expectant parents and parents of infants are free at Verdal Healthy Life Centre.

Effect: Evaluation has shown that the "Good Food" course makes it easier to plan healthy meals and that it helped change eating habits. Participation in the course seems to provide increased knowledge of diet, increased motivation to change dietary habits, significantly reduced use of saturated fats and greater knowledge of saturated versus unsaturated fats (Directorate of Health, 2019).

Evaluation: Questionnaires before the course, at the end of the course and 6 months after the end of the course for participants in four counties. These measured participants' expectations for the course, benefit they experienced from the course and their intake of the food and drinks that were of particular focus on the course (Mortensen, 2012).

Limitations linked to Covid 19: The number of participants may have been reduced; somewhat less convenient cooking, focus on keeping physical distance, the use of hand gel for disinfection.

References: Mortensen, 2012; Directorate of Health, 2019;

<https://www.helsedirektoratet.no/tema/frisklivssentraler/tilbud-ved-frisklivssentraler-og-veilederkurs#kostholdogbramatforbedrehelse>

Teaching resources for student kindergarten teachers about food and meals

Owner/provider: National Centre for Food, Health and Physical Activity

Geographical level: National. The initiative is voluntary for users.

Purpose/aim: To provide student kindergarten teachers with expertise and specific tools to develop and carry out food and meal activities in kindergartens.

Target groups: Student kindergarten teachers. Also relevant for all staff in kindergartens

Time period: From 2015 to today.

Organisation/implementation: Through the teaching programme, students are introduced to the Sapere method; they can develop knowledge and understanding about food and the role of meals in kindergarten, and they should be inspired and motivated to work on activities that develop enjoyment of food. In addition, students will acquire knowledge about which nutrients and foods are important for children's development and health, and how they can increase children's intake of vegetables, fish and whole grain products (National Centre for Food, Health and Physical Activity, 2018a).

The teaching resource consists of three teaching sessions of 4 hours and one session work placement, where students will develop and carry out food and meal activities with the children in one of the kindergartens where they are doing work placement.

Session 1: The sensory qualities of food and children's eating development

Session 2: Nutrition, diet and health

Session 3: The mealtime, development of identify and socialisation

Cost: The teaching resource is accessible and free to use.

Effect: The effects of the initiative have not been evaluated.

Evaluation: The teaching resource has not been scientifically evaluated but was very positively evaluated by student teachers who have undergone the course.

Limitations linked to Covid 19: The teaching resource is available digitally. The practical part requires access to kitchen facilities. The practical task should be carried out physically in a kindergarten setting.

Reference: <https://mhfa.no/undervisningsressurs-for-barnehagelarerutdanningen>

HealthierKids (SunnereBarn)

Owner/provider: GreeNudge. GreeNudge is a network-based, not-for-profit organisation with multi-disciplinary expertise in food, health, environment and consumer behaviour. HealthierKids is one of GreeNudge's focus areas.

Geographical level: National. The initiative is web-based. Participation is voluntary.

Purpose/aim: To help children have better dietary habits and increased pleasure in food and mealtimes in kindergarten. The goal is also to improve and streamline work on food and meals in kindergarten and after-school care. HealthierKids also aims to help reduce social inequalities.

Target groups: Kindergarten staff, children in kindergartens; parents.

Time period: From autumn 2017 to today.

Organisation/implementation: HealthierKids consists of a competence package with courses and training materials for kindergarten staff. The package also includes the "Meal Check", which evaluates the food offered in the kindergarten. The initiative aims to facilitate and streamline work on food and meals in line with the framework plan for kindergarten. Subscriptions are for 1 year at a time.

The e-learning course for kindergarten staff consists of six modules, with the following themes: 1. Introduction to HealthierKids for kindergartens; 2. Directorate of Health's dietary advice and Norwegian children's diet; 3. The framework plan for kindergartens and guidelines for food and meals; 4. More fruit and vegetables in the kindergarten - practical tips for implementation; 5. More fish and seafood in the kindergarten - practical tips for implementation, and 6. Sustainability and environmentally friendly practice - practical tips for implementation.

Subscribers gain access to various tools, such as ready-made shopping lists, a menu planner, games to use in play with children, smart food tips and the activity of the month. The food tips are all about packed lunches, portion sizes, drinks, food at birthday celebrations and food to take on trips. The activity of the month shows how the kindergarten can work with food and mealtimes at the same time as other disciplines in the framework plan such as language, motor skills and social learning.

HealthierKids cooperates with commercial operators who offer ready-made planned meals for the kindergartens, and with a large grocery chain. The website [sunnerebarn.no](https://www.sunnerebarn.no) also contains a knowledge base with information relevant to kindergartens, about diet, physical activity and mealtime routines. HealthierKids has published a book, "Diet and Physical Health", which is a short course book for use in the education of kindergarten teachers. The book provides basic knowledge about diet and health and how kindergartens can work with food and mealtimes. On the HealthierKids website, there is material that can be used in dialogue with parents. Themes include packed lunch tips, tips on portion sizes, drinks, shopping lists, smart food for trips and tips for food at birthday celebrations.

Cost: Participation is free, but participants have to sign up for a year. The initiative begins in January and August each year. Signing up gives access to a competence pack. The project is financed by the Gjensidige Foundation.⁶

Effect: The effect of the initiative has not been scientifically evaluated yet. As of March 2021, fewer than 5 % of Norwegian kindergartens subscribed to HealthierKids (250 of 5620).

The meal check shows that kindergartens which have participated in HealthierKids for over a year have increased the use of sandwich fillings with the keyhole mark, and this has contributed to improving the quality of food served. They have also increased the use of fish, fish-based fillings, low-fat dairy products, vegetables and fruits and wholegrain rice/wholegrain pasta, and several of the kindergartens are planning to offer food in line with the "Guidelines for food and meals in kindergarten" after a year of participation.

Evaluation: The meal check is a simple, digital scoring tool which evaluates the kindergarten's work with food and meals. The check can be used by kindergartens to evaluate their own practice and progress in their work with diet. Kindergartens are sent the meal check when they join HealthierKids and every year after.

Limitations linked to Covid 19: As the measure is online, it can be implemented regardless of infection control.

Reference: <https://www.sunnerebarn.no/>

⁶ The Gjensidige Foundation is Norway's biggest financial foundation and has two main purposes. One is to support projects which are of benefit to society, and the other is as the main owner of Gjensidige Insurance ASA.

Fish Fun (Fiskesprell)

Owner/provider: Cooperation between the Ministry of Health and Care Services, the Ministry of Trade, Industry and Fisheries, and the Norwegian Seafood Council which, together with the Norwegian Fishermen's Sales Organisation, fund the initiative.

Geographical level: National. The initiative is voluntary.

Purpose/aim: To get children and young people to eat more fish and seafood, and to help reduce social inequalities in diet.

Target groups: Employees in kindergartens; others who work with children; students training to become kindergarten teachers; pupils studying child and youth work courses ("BUA pupils") in upper secondary schools.

Time period: From 2007 to today.

Organisation/implementation:

Fish Fun is a national dietary programme, where the Directorate of Health and the Institute of Marine Research are professional contributors. Fish Fun disseminates knowledge and inspiration related to children and fish/seafood through courses, materials and support, and is based on the Directorate of Health's dietary advice. The work is rooted in the Partnership for Public Health in Norwegian counties. Every year, all of Norway's counties can receive funding from Fish Fun. Fish Fun offers free whole-day courses to kindergarten employees in cooperation with the county authorities, and Trøndelag County Council organizes Fish Fun courses as part of their regional public health work. The courses consist of a theoretical section about children, diet and seafood, and a section with practical cooking. Kindergartens and schools can also receive support for the purchase of fish and seafood for events where seafood is prepared and served to parents/guardians.

Cost: Taking part in the courses is free. In addition, Fish Fun offers financial support for buying in fish and seafood for teaching and for various events in kindergartens and schools, e.g. events for parents.

Effect: From 2007 to 2017 almost 13 000 kindergarten staff, after-school staff and BUA-pupils have taken part in Fish Fun courses. Kindergartens which have had staff on the courses use more seafood in their hot food serving, as sandwich fillers and food for trips/hiking, and have a greater focus on healthy food than kindergartens which have not taken part, according to Fish Fun's own studies and Directorate of Health studies of meals, physical activity and

environmentally oriented health in kindergartens (Directorate of Health, 2012). Ipsos' impact evaluation from 2020 showed that Fish Fun appears to have an effect on the consumption of seafood in kindergartens, and that there is a greater proportion of children who like fish in kindergartens which have attended courses. In addition, employees say they feel more competent, and have a lower threshold for making different seafood dishes. The survey shows a positive relationship between the competence of the adults and the serving rate of seafood in the kindergarten (Ipsos, 2020).

Evaluation: A major evaluation of the impact of Fish Fun measures targeting kindergartens was carried out in 2020. The evaluation consisted of a questionnaire and in-depth interview (Ipsos, 2020).

Limitations linked to Covid 19: Many planned Fish Fun events were postponed or cancelled due to the coronavirus pandemic. This included courses for employees in kindergartens and kindergarten visits. Fish Fun instead posted short films with possible activities that could be carried out outdoors, with few participants and in a socially distanced way:

<https://vimeo.com/405404504> (in Norwegian, only).

References: <https://fiskesprell.no/>; Fish Fun in Trøndelag:

<https://www.trondelagfylke.no/vare-tjenester/folkehelse-idrett-frivillighet/folkehelse/prosjekter/fiskesprell/>;

Evaluation: <https://fiskesprell.no/om-fiskesprell/resultater-og-effekter/>;

About Fish Fun in English: <https://fiskesprell.no/om-fiskesprell/about-fiskesprell/>

Five-a-day for kindergarten

Owner/provider: Information Office for Fruit and Vegetables (OFG).⁷

Geographical level: National. The initiative is voluntary.

Purpose/aim: Increase access to vegetables, fruit and berries in kindergartens; vegetables, fruit and berries should be a natural part of all kindergarten meals.

Target groups: Kindergarten children; staff in kindergartens; parents.

Time period: From 2006 to today.

Organisation/implementation: Five-a-day for kindergarten is a concept whereby OFG wants to inform and inspire kindergartens, children and parents through increased knowledge and inspiration for staff, learning through play for children, and information and inspiration for parents. All kindergartens that sign up receive a free inspiration package with materials and information. The inspiration package consists of an apple slicer; a potato masher; three children's aprons; posters; information brochures; information for parents; "five a day" stickers; a fruit and vegetable lottery game, and books featuring two characters, Mons and Mona. The kindergarten receives information, tips and materials to help to focus on diet in kindergarten. The children receive materials to learn through play, while parents receive information through a brochure developed for families, and through newsletters. OFG has also developed an information film for parents, which can be used at parent meetings:

<https://www.youtube.com/watch?v=a2yScdNrpSI&t=21s> Staff in kindergarten receive a free e-learning course containing articles on diet in kindergarten, the benefits of a greener diet and practical tips: <https://www.frukt.no/barnehage/e-laringskurs/steg-1/>.

Five-a day kindergarten has its own Facebook page:

<https://www.facebook.com/5omdagenbarnehage/>. The concept also has its own pages on the OFG website: www.frukt.no/barnehage/ where articles are published aimed at kindergarten staff and including tips and ideas about how to increase the amount of vegetables, fruit and

⁷ OFG is a foundation, and a joint organization for commercial players in the fruit and vegetable industry in Norway. Its purpose is to increase the consumption of fresh fruits, berries, vegetables and potatoes in Norway. OFG was created to provide generic (neutral) information and marketing work to benefit anyone who produces and sells fresh fruit and vegetables foods. OFG is financed under the Agricultural Agreement in Norway by receiving part of the sales tax on horticultural products.

berries eaten in kindergarten. All kindergartens which become members of five-a-day kindergartens receive regular newsletters with competitions, information, recipes and news.

Effect: The initiative has not been scientifically evaluated. As of May 2020, 3850 kindergartens were registered with the initiative (67 % of all kindergartens in Norway). Over 3000 kindergarten staff did the e-learning course in 2020.⁸

Evaluation: In 2016 Kantar TNS undertook a survey on diet in kindergartens, commissioned by the OFG. The study focused on fruit and vegetables. Kantar TNS found that the kindergartens that were five-a-day kindergartens had a greater focus on health when celebrating birthdays than kindergartens that were not part of the initiative and served much more homemade soup. (Kantar TNS, 2016).

Limitations linked to Covid 19: None reported.

Reference: <https://www.frukt.no/barnehageartikler/velkommen-til-5-om-dagen---barnehage/>

The BRA-study: An intervention to increase the intake of vegetables in kindergarten children

Owner/provider: Department for Nutrition, University of Oslo.

Geographical level: Regional; 73 kindergartens in Vestfold and Buskerud counties.

Purpose/aim: Develop, implement and evaluate a theory- and knowledge-based intervention to promote the intake of vegetables among kindergarten children (3-5 years), by changing food-related practices at home and in kindergarten. The study was a group randomised, controlled study.

Target groups: Kindergarten children aged 3-5 years, staff in kindergartens; parents/guardians.

Time period: 2015-2016. The intervention itself lasted 6 months.

Organisation/implementation: The intervention aimed to increase the amount of vegetables for each meal; increase the frequency that vegetables were offered each day, and increase the variety of vegetables offered over a month by influencing the supply and availability of

⁸ OFG informs us that there was major take-up of the course during 2020 when kindergartens were closed because of Covid-19 and the staff had time for other tasks – usually there are a few hundred people taking the course each year.

vegetables at home and in kindergarten, encouraging tasting/eating vegetables at home and in kindergarten and by influencing parents and kindergarten staff to be good role models for vegetable intake at home and in kindergarten. The intervention programme consisted of an inspiration day for the kindergartens involved with a practical and theoretical part. In the practical part, the kindergarten staff cut up raw vegetables and made minestrone soup. The theoretical part focused on offer, accessibility, encouragement and role models.

Kindergartens also received material: a hand blender, several posters/posters developed for the BRA study, brochure on the BRA study, Lotto games, children's aprons, the Directorate of Health's dietary advice brochure, and a poster with the national guidelines for food and meals in kindergarten. All parents in the involved kindergartens were given material with information about the study, brochures with tips and recipes, activity sheets, Post-it notes to write shopping lists/reminders as well as mini-books about the characters Mons and Mona, and inspiration to play tasting games with vegetables. Both kindergartens and parents had access to relevant websites with tips and advice; recipes; vegetable reviews and food booklets / other materials (parents); and courses and training (kindergarten staff):

<https://www.med.uio.no/imb/forskning/prosjekter/bra-studien/ressurser/>

Cost: The intervention was financed by the Norwegian Research Council and Throne Holsts Foundation for nutritional research.

Effect: The study found only a slight increase in vegetable intake among children in the kindergartens which took part. The effect of the intervention corresponded to an increase of one cherry tomato per day. The effect on children's intake of vegetables at home was negligible (Kristiansen et al., 2019).

Evaluation: The impact evaluation on vegetable intake, possible determinants and food-related practices were measured using data collection in spring 2015, spring 2016 and spring 2017 among intervention kindergartens and parents and control kindergartens and parents. The evaluation consisted of two web-based questionnaires for parents and observation of two meals in one day in kindergartens.

Limitations linked to Covid 19: Not stated.

References: <https://www.med.uio.no/imb/forskning/prosjekter/bra-studien/> ; Kristiansen et al. (2019).

Parent focussed e-health initiative to influence nutrition in small children: Early Food for Future Health and Food4toddlers

Owner/provider: The Priority Research Centre for Lifecourse Nutrition, University of Agder

Geographical level: National; participation was voluntary.

Purpose/aim: Promote good meal practice with parents and a healthy diet for children (Early Food for Future Health); make parents aware of the importance of the environment to their child's eating development and the establishment of good food habits (Food4toddlers).

Target groups: Parents of children aged 6 to 12 months (Early Food for Future Health); parents of children aged 12 to 18 months (Food4toddlers).

Time period: 2016-2017 (Early Food for Future Health); 2017-2018 (Food4toddlers).

Method: *Early Food for Future Health* was an e-learning programme, where parents in the intervention group received a monthly email with links to the web page of the month. There they could see a short film on age-adapted themes within infant nutrition and development of eating habits, and they could find recipes and short films showing how to make your own food for children simply.

Food4toddlers: Participants in the intervention group were given access to the Food4toddlers website for six months. The first two lessons of the intervention were available when participants were given access to the website. Then a new lesson became available each week. In total, the intervention consisted of 22 lessons. The website contained information about diet, films on how to create a healthy food and eating environment as well as articles, recipes and discussion forums. The lessons focused on the availability of good food and how parents can be good role models.

Cost: Both studies were financed by the University of Agder. Participation was free for parents.

Effects: *Early Food for Future Health:* The children in the intervention group were served fruits/vegetables more often and had tasted more different types of vegetables than the children in the control group. A greater proportion of the children in the intervention group ate breakfast and dinner with their family most of the week, and they less frequently watched TV or tablets while eating (Helle et al., 2019).

In *Food4toddlers* the researchers found an increase in vegetable intake of approximately 0.5 servings per day for the children in the intervention group when the intervention was

complete. There was no effect on the fruit intake or intake of energy-dense food. At follow-up, six months after the intervention, the researchers found no effect, but the drop-off in the study was relatively large. The researchers ask whether closer follow-up is needed to have a long-term effect of such interventions, or whether individual adaptation of the intervention, based on information about the parents' own diet and physical activity, will lead to better effect (Røed et al., 2021).

Evaluation: Measures of children's food intake and eating habits, meal routines, and how parents gave their child food (*Food for Future Health*); (Food4toddlers).

References: Helle et al., 2019 ; Røed et al., 2021.

Measures which focus on both diet and physical activity

Active and Happy (Aktiv og glad) – web-based activity for kindergartens and schools

Provider: Trenpånnett.no AS

Geographical level: The whole of Norway

Purpose/aim: Contribute to a physical break in everyday kindergarten and school life

Target groups: Children in kindergarten

Time period: 2015-to date. Only started working with kindergarten children in March 2020.

Method: Active and Happy is an online activity programme for kindergartens and schools throughout the country. The service is clear and simple and requires no training. Activities can be carried out anywhere, without special equipment, for example in the classroom, or in a room in the kindergarten with a smartboard/screen. The activity videos are recorded by child instructors, while choreography, content and structure are prepared by physiotherapist, personal trainer and group instructors. With children as instructors, the idea is that the threshold for participating should be lower. The videos contain simple stretches and exercises focusing on circulation and posture; funny dances that increase energy and pulse; family exercise: training videos that the whole family can use at home; yoga; strength, coordination, motor skills and balance.

The measure also has a dietary component; "Smart food". Smart food comprises videos that show how to make a healthy breakfast, lunch, healthy snack and snack meals easily with

recipes and tips for a healthy diet. The videos can be used as inspiration either in kindergarten or at home with children and are prepared by a nutritionist.

Cost: For kindergartens taking part: 2500 kroner per year; both the kindergarten and the parents have access to the videos, so they can be used at home and at kindergarten.

Effect: As of March 2021, 40 kindergartens had an annual subscription to Active and Happy.

Evaluation: The measure has not been formally evaluated. At the request of parents and teachers to adapt activities to children, the online service Active and Happy came into being.

Note: This project can be developed further towards 0-3-year-olds in kindergarten.

References: Email: post@aktivogglad.no; <https://aktivogglad.no/>

Good habits start early – The growing-up programme in Nord-Trøndelag

Provider: Trøndelag county

Geographical level: Regional; 120 kindergartens in the northern part of Trøndelag county (Nord-Trøndelag)

Purpose/aim: Better diet, increase physical activity and develop better motor skills in kindergarten children.

Target groups: Kindergarten staff and children.

Age group of children: 0-6 years.

Time period: 2014-2016.

Method: There were specific requirements for kindergartens that wanted to participate: The children should be able to go on walks one or two days a week; a physical or motor activity would be organised every day where the focus was on the inactive children; a fish meal should be served at least once a week; fruit and vegetables should be served daily; the kindergarten would record the activities organized and the food served; the employees would attend courses under the auspices of the initiative, and the kindergarten would have physical activity, motor development and diet as the theme on one planning day each year.

250 kindergarten employees from 70 different kindergartens participated in a day course for competence building in physical activity and motor skills, outdoor activities and diet. The course participants were given a recipe booklet with recipes for food with vegetables, fish

meals, simple homemade soups and wholegrain bread. The project coordinator gave a lecture on the importance of physical activity and a nutritious diet at staff meetings in kindergartens, so that all employees had the same increase in competence. The project team also attended parent meetings where desired. Each kindergarten was given a backpack with equipment such as first aid equipment, knife, rope, saw, tarpaulin,⁹, barbecue grate, campfire pan, compass, magnifying glass, flora book, booklet "Good food in the kindergartens" and hiking tips. The equipment was free. The initiative also had a website where kindergartens could pick up recipes, hiking activities, outdoor activities and templates for planning work, and all kindergartens that participated received a year's free use of the website "Active and Happy".

Cost: Free for participating kindergartens. Total annual cost of project: around 1.5 million kroner.

Effect: The initiative has not been scientifically evaluated. However, 111 kindergartens received a questionnaire that 56 answered. Kindergartens reported that they were mostly more focused on all three areas: healthier diet; increased levels of hiking and outdoor activities; and increased physical activity and motor exercise after participation in the initiative.

Evaluation: The kindergartens found that these were relevant topics, and it was a well-founded initiative. They also highlighted that it was free and easy to attend courses because they were short, and took place in the vicinity of the kindergartens (the same municipality)

References: Trøndelag county c/o project coordinator Merete Haugen. Email: merete.haugen@verdal.kommune.no; <https://mhfa.no/gode-vaner-starter-tidlig--oppvekstprogrammet-i-nord-trondelag>

⁹A tarpaulin is a light, strong cloth with ropes attached, which can give shelter overhead from rain and wind.

Eighteen thousand hours – health promotion in kindergartens and primary schools

Provider: Østfold county, Østfold Health, Partnership for Public Health in Østfold.

Geographical level: Regional; nine municipalities in Østfold county

Purpose/aim: Contribute to well-being and coping in children and young people, good learning outcomes and for students to complete the 13-year education system. One of the sub-objectives was to anchor health promotion work in the organisation's management documents and in the working methods of the organisation.

Target groups: Kindergartens in Østfold county.

Age group of children: 0-6 years.

Time period: 2014-2016.

Method: The work was rooted in the organisation's management documents. The project was based on the involvement of staff, children and parents alike. The staff were given lectures on the importance of risk-filled play for children. All participating organisations submitted proposals for measures within the subject areas of the project: physical activity, nutrition, mental health and well-being. Four out of nine measures from kindergartens involved work with physical activity.

Measure a) A fixed monthly activity day as inspiration for increased and more varied physical activity the other kindergarten days.

Measure b) All 0-6-year-olds to have an hour of exercise in the gymnasium every week.

Measure c) Joint activity days for kindergarten and after-school care. The organisations to lead the activities on alternate occasions.

Measure d) "Micromotus" with basic motor activities to music and stories for toddlers and older children's section four times per week. Two of the measures were aimed at diet in kindergarten. Measure e) National guidelines for food and meals in the kindergarten are met.

Measure f) The kindergarten will offer fruit and vegetables every day.

Cost: Local funds.

Effect: Measure a) The staff were positive, and the children enjoyed the activities.

Measure b) The measure was not person-dependent and was well incorporated into weekly plans. Measure c) The measure reached many people and contributed to reducing social inequality. Measure d) Everyone can take part and achieve something.

The initiative reduces social inequalities. Kindergartens facilitate all children to become physically active for 60 minutes every day. A greater proportion of kindergartens reported planning work on diet and nutrition after implementing the measures, and more offered fruit and vegetables daily.

Evaluation: The measure has not been scientifically evaluated, but a final report has been prepared for the project (Brenne, 2016). Criteria have also been drawn up with a guide for the approval of kindergartens as health-promotion kindergartens, which the county follows up. Certified kindergartens are ambassadors within their municipality. A network has been established for health-promotion kindergartens.

References: Elsie Brenne, Public Health Advisor in Viken county: elsieb@viken.no; <https://ostfoldhelsa.no/ukategorisert/helsefremmende-barnehager-og-skoler/>; <https://mhfa.no/attentusentimer>

Measures to improve the level of physical activity in kindergarten children

EnCompetence – Competence in developing the kindergarten's indoor and outdoor environment

Provider: Queen Maud University College of Early Childhood Education ¹⁰, OsloMet, National Knowledge Centre for Kindergartens, Espira Training Workshop and Trondheim council.

Geographical level: Eight kindergartens which are either hosts for trainee kindergarten teachers at these training colleges, or who were involved in the project as a partner.

Purpose/aim: To investigate how the environment helps promote play, learning, psychosocial and physical health. The project also aimed to increase expertise on planning, design and development of kindergartens' physical indoor and outdoor environments, as well as developing criteria and practical tools for how to improve the physical environment in existing and planned kindergartens.

Target groups: Researchers in kindergarten studies, kindergarten owners, kindergarten staff, architects, landscape architects and relevant professions; children in kindergarten

Age group of children: 3-4 years

¹⁰ DMMH: Queen Maud University College of Early Childhood Education.

Time period: 2017-2018

Method: Design-based research (design experiment in education) with the use of both quantitative and qualitative methods. In this study, the physical outdoor environment was changed to see if it increased the degree of play. Phase 1 consisted of video observation and analysis of 80 3-4-year-olds' use of the existing environment in kindergartens. In phase 2: criteria were developed for optimal indoor and outdoor environments in kindergarten and an intervention was carried out to change these environments. Phase 3: Observation and analysis of children's use of the environment after the intervention. Interviews of children and employees in the kindergarten. Phase 4: Further develop criteria for optimal environments and develop internet-based tools for the improvement of the physical environment in kindergartens. Physical activity was measured using observation (osrac-p observation protocol). Physical activity was encoded on a scale of 1-5, where 1 is complete rest and 5 is fast movements and high energy.

Cost: Financed by the Norwegian Research Council. Sum not disclosed.

Effect: The main results show how important it is that kindergartens promote children's free play and environments that invite many different types of play, because this is positively related to the children's involvement, well-being and physical activity levels. The results show that working with the physical environment in the kindergarten, developing good play zones both inside and outside, and adding enough materials and a range of materials, strengthens children's opportunities for play. By facilitating areas, fixtures and play materials that invited physical, gross motor play, the results showed that the boys, to a much greater extent, took this opportunity for romping around and play fighting. This type of play is called "rough-and-tumble play". In rough-and-tumble play children do things like climb over each other, wrestle, roll around and even pretend to fight. Children of both sexes play together, both with body contact and individually, while having a shared experience of doing something that is fun together.

Evaluation: Video observation of the children in kindergarten before and after intervention; interviews with children and employees of the kindergarten after the intervention.

Note: Criteria with tips on how to develop the physical environment of kindergartens are available on a dedicated online resource: <https://barnehagemiljo.no/>

Reference: Sandseter & Storli (2020).

Play, movement and relaxation. Kindergarten's indoor space as an educational development project

Provider: The Danish School of Education and Vestfold University College

Geographical level: Local; three kindergartens in Copenhagen and three in Tønsberg

Purpose/aim: Develop knowledge on the influence of the room's furnishings and organisation in the kindergarten on 0-6-year-olds' movement play, rest and relaxation.

Target groups: Student kindergarten teachers and student architecture students, educational staff, architects, builders, managers.

Age group of children: 0-6 years

Time period: Not given.

Method: Phase 1. Room assessment form to analyse the situation and point out the desired changes taking into account the intended function of the room. Mapping and planning. Phase 2. Logging of activities and events. Phase 3. Observation of how the children used the furniture and artifacts. Phase 4. Semi-structured interview

Cost: Unknown

Effect of the intervention: In one kindergarten, the room change giving less floor space and more movable furniture meant that the children could be active to a much greater extent indoors and that more activities could take place at the same time. The staff felt they observed a clear decline in physical conflicts such as fighting and physical bullying. Large and tumultuous movements indoors gained more acceptance among the staff group. In another kindergarten, staff argued that new areas for movement appealed to more children, that more children could play undisturbed with minor conflicts and that the fellowship between children from different departments had been strengthened through the room changes that led to different areas of activity. A large room with a large open floor surface that had created chaos and domination by the older boys was replaced with furniture that gave the children options for various activities at the same time. The relaxation area, with adults present, was a success. A third kindergarten did not experience an increased level of physical activity among the children; However, the staff found that the sofa and mattresses were very effective for the children to relax and rest. Mattresses and mats were popular to lie on and provided an inviting reading arena with greater peace and concentration. The result was more reading.

Evaluation: Through the changes and adaptations to the space, the educational intentions were largely achieved. The space evaluation form was an appropriate tool for the project and contributed to increased awareness and reflection in the staff group. In two out of three kindergartens, it turned out that the relaxation and rest areas became more prominent than the activity area. The staff believed they had developed a new and more dynamic understanding of the space. Only when staff actively look at and jointly address the space as an educationally significant and dynamic, or changeable area, will it produce effects. The knowledge and professionalism of the staff must be used consciously to take the children's perspective when it comes to assessing and optimizing the physical environment of the kindergarten.

Reference: Moser (2012).

HOPP – Growing up Healthy in Horten

Provider: Horten municipality.

Geographical level: Local; kindergartens in Horten municipality

Purpose/aim: Promote health, development, learning and well-being among children and young people in Horten municipality, and reduce social inequalities in health. It was also a goal that HOPP activities would be carried out every week in all kindergartens, and that kindergartens move from HOPP activities to more holistic thinking where physical activity is a natural part of the learning environment in kindergarten.

Target groups: Children and young people.

Age group of children: 0-6 years / 6-12 years for the schools included in the measure.

Time period: 2013.

Method: The physiotherapist in Horten municipality surveyed kindergartens' work with physical activity using a questionnaire. Learning networks were established where kindergartens could share good practice in physical activity, diet and recipes with each other. A HOPP coordinator worked with the kindergartens on the operation and further development of the HOPP project. Activity leader courses were carried out to ensure that all age sections in all kindergartens had an activity leader. At staff meetings, a HOPP break was held where everyone in the staff group participated in a short physical activity or shared good experiences.

Cost: The project requires close cooperation within the municipal focus area of childhood. The project was funded using existing internal resources and frameworks.

Effect: HOPP is developing an activity booklet with a number of activities that are reviewed on the activity leader courses. The activities have clear goals. They have also made a list of materials that the kindergartens have purchased and have available in a HOPP toolbox.

Evaluation: Horten municipality will evaluate the project in cooperation with Kristiania University College, Department of Health Sciences. The results show that all 6-12-year-olds who participated in the project had over 60 minutes of physical activity of moderate or high intensity (MVPA)¹¹ every day (Deng & Fredriksen, 2018). Unfortunately, physical activity was not measured for the kindergarten children who participated in this intervention.

References: Horten municipality, project leader Linda Jakobsen. Email: linda.jakobsen@horten.kommune.no; Deng & Fredriksen (2018).

Children in Motion in Sandefjord municipality

Provider: Sandefjord municipality in cooperation with the University of South-Eastern Norway (USN).

Geographical level: Local; 11 municipal kindergartens in Sandefjord- municipality.

Purpose/aim: Increase physical active play in kindergarten children, and to create a dialogue-based, reflexive and integrated practice around physically active play.

Target groups: Kindergarten staff.

Age group of children: 3-4 years.

Time period: February - May 2015.

Method: This is a contextual intervention design in which staff in kindergartens largely helped to design and implement the objectives and content of interventions in their respective kindergartens. Children in Motion was a randomised controlled study in which physical activity levels were measured before and after the intervention period.

Cost: Funded by the Directorate of Education. Amount not specified.

¹¹ MVPA stands for “Moderate to vigorous physical activity”

Effect: The intervention showed an increased level of physical activity and a reduction of sedentary time in the intervention kindergartens compared to the control group. Staff have assessed the effectiveness of the intervention and highlighted that they set common goals for the kindergarten on what activities and measures should be used to increase physical activity, practical activities have been started in joint meetings and physically active play has become a topic in staff's professional collaboration as the most prominent effects.

Evaluation: 3-4-year-olds increased their physical activity in MVPA by 50 minutes per week in kindergarten and reduced sedentary time by 70 minutes after the intervention (Andersen et al., 2021). Factors that seem to have an impact on successful implementation were the inclusion of the entire personnel group, the staff's (co-) ownership of the project and the dissemination of practical ideas from the project managers. Implementation of a written reflection practice was difficult to implement. Kindergartens, to a greater extent, have an oral rather than written culture of reflection (Øvreås et al., 2020).

References: Andersen et al. (2021) and Øvreås et al. (2020).

Nature Pilots

Provider: National Knowledge Centre for Kindergartens in Cooperation with the National Kindergartens Association (PBL) and Norsk Friluftsliv (Norwegian Outdoor Life)

Geographical level: National; private and municipal kindergartens throughout the country. Participation is voluntary.

Purpose/aim: Educating nature pilots in kindergartens, who will inspire colleagues, children and parents make better use of the kindergarten's natural surrounding areas for large and small trips.

Target groups: Kindergarten staff.

Age Group Children: 0-6 years.

Time period: 2017-2019.

Method: In the autumn 2017, 2018 and 2019, Nature Pilots published the brochures "Nature as a Learning Arena" in conjunction with Outdoor Life week. In the brochures, kindergartens get tips for various activities and food they can make outside. All activities are linked to the new framework plan for kindergartens. The day course "Nature Pilots – out with the

kindergarten in local nature” was offered to all private and municipal kindergartens throughout the country.

Cost: Not stated.

Effect: Not stated.

Evaluation: The course was requested, and in 2016 the project was transferred from the Private Kindergartens Association to the National Knowledge Centre for Kindergartens.

Reference: National Knowledge Centre for Kindergartens. (2019).

Live and Move

Provider: Vestfold and Telemark counties and Bamble municipality.

Geographical level: Regional; municipalities in Vestfold and Telemark.

Purpose/aim: The programme should contribute to better living conditions among kindergarten children in Vestfold and Telemark through: increased physical activity and joy in movement; healthy and inclusive meals; and mental and social well-being. The sub-intervention on physical activity should help children be physically active for at least 60 minutes daily.

Target groups: Kindergartens and schools. In kindergartens: children, staff, parents.

Age group of children: 0-6 years

Time period: 2018 – ongoing.

Method: Dissemination and implementation of Live and Move using a guide. The interactive guide describes how Live and Move can be anchored in the kindergarten, information about various research and knowledge-based tools, and working methods for achieving the goals of Live and Move. There is also an overview of both mandatory and voluntary courses in diet, physical activity and work on attitudes. Role descriptions with responsibilities and tasks for the different target groups in Live and Move are clearly described. In addition, free all-day courses with themed physical activity and joy of movement are offered. An activity box, a digital idea and resource bank with various activities for increased activity in kindergarten, and an activity folder with activities that can be done with children of different ages.

Cost: A total of 12 million kroner for the entire training course, from kindergarten, primary and lower secondary school and after-school care, to health and care topics in upper secondary school (equivalent to approx. 1.17 million euros). Funded by the Sparebank Foundation DNB and Vestfold and Telemark Counties.

Effect: The programme creates good learning environments, increased well-being and better results through inclusion and active learning.

Evaluation: The measure has not been scientifically evaluated, but the organisers believe it is highly likely that the measure will lead to both better diet in kindergarten children and that it will increase the level of physical activity in kindergarten children. The programme is ongoing.

References: Jorunn Borge Westhrin, project leader in Live and Move in Telemark. Email: jorunn.westhrin@vtfk.no; <https://www.vtfk.no/meny/tjenester/opplaring-og-folkehelse/folkehelse/liv-og-rore/liv-og-rore-i-barnehager/>

Groruddalen Project

Provider: Grorud District (greater Oslo area), Department for Children and Young People
Geographical level: Local; Groruddalen¹²

Purpose/aim: Help children establish good living habits. The objective is for all children to meet the health authorities' recommendations for diet and physical activity.

Target groups: Children in kindergartens.

Time period: 2013-2015.

Method: In August 2014, seven sports educators were employed across five kindergartens in the Grorud district. The sports educators were responsible for planning, implementing and assessing public health work at local level, and they took on tasks related to competence building in parents and employees at the kindergarten and unit level. An objective measurement of physical activity was carried out with 107 children aged 3-6 years using accelerometers. In addition, kindergarten employees took part in a theme day about physical

¹² Groruddalen is a joint name for the north-eastern districts in Oslo.

activity where they gained knowledge about the importance of physical activity, what affects children's activity levels and how to facilitate physical activity in kindergarten, and an activity leader course focusing on planning and carrying out physical activity with children. Common guidelines for diet and physical activity were prepared. Themed days about physical activity were also conducted for parents.

Cost: In the letter of intent entered into between the state and the municipality of Oslo in August 2015, a new decade-long cooperation with an area-oriented focus on Groruddalen was agreed, which was to be co-financed by the parties. The financial framework for the initiative will be clarified in the annual budget processes in central and local government for the 2017 budget year onwards.

Effect: The proportion of children meeting the recommendations for 60 minutes of daily activity increased from 16 per cent in October 2013 to 56 per cent in June 2015. At the same time, the proportion of children active less than 30 minutes per day has been reduced by 77 per cent.

Evaluation: On the basis of good experience with sports educators in kindergartens, the district has decided that in the long term there should be one specialist in all departments in the borough with children aged 3 to 6 years to increase progress in public health work and ensure the quality of the measures at the kindergarten level. A programme description has been prepared for the Groruddalen project 2017-2026.

References: Dønnestad, Kleppe & Strandmyr (2015);

https://www.regjeringen.no/contentassets/374dbc4902874d71875cc671b02df58d/endelig_programbeskrivelse_med_underskrift.pdf

“Friskuser i farta”

Provider: Bamble municipality

Geographical level: Local; Bamble municipality

Aim/purpose: Work systematically with kindergarten children being physically active and to ensure that kindergartens in the municipality have physical activity as a common priority area.

Target groups: Children in kindergarten

Time period: 2016 – to date.

Method: A measure the child physiotherapist in Bamble municipality has initiated in kindergartens is "Fiffen – Friskusene on the move", which is a group of activity contacts. All kindergartens, both private and municipal, have one or two employees participating in the group. The activity contacts are given training in facilitating activities for the children and they act as a support for boards, a motivator for fellow employees and a driving force for physical activity in kindergartens. The "Fiffen – Friskusene on the move" group meets four to six times a year, under the direction of the paediatric physiotherapist. At the meetings, experiences and good examples of how to facilitate daily physical activity are shared. This is done, among other things, by the fact that the activity contacts are hosted in each other's kindergartens. One kindergarten is then responsible for communicating one of their activities to the others. "Fiffen – Friskusene i fart" has developed an activity folder that is given to the kindergartens in the municipality. The activities are taken from an activity booklet developed by one of the kindergartens participating. In addition, all kindergartens have contributed one activity each. In 2016, "Fiffen – Friskusene i fart" developed activity cards – one for the youngest children (0-3 years) and one for the oldest (3-6 years). This is short and contains a number of activities to be ticked off when they are completed. When a section in a kindergarten has ticked off at least 15 activities, the card is delivered to the child physiotherapist and the section is included in a draw for activity prizes.

Cost: Support from Telemark county. The funds have been used to hire in course speakers, to buy activity equipment, as well as prizes. A kite and a GPS have been purchased for all kindergartens. The GPS is used for geocaching, which is a treasure hunt for the GPS coordinators.

Effect: All kindergartens in Bamble municipality are still actively working on the topics of physical activity and health. They follow the health authorities' recommendations on diet and are included in Fish Fun. Daily physical activity indoors is arranged, and in the outdoor area or on trips in nearby natural areas.

Evaluation: The initiative has not been formally evaluated.

References: Mette.wisloff@bamble.kommune.no;

<https://mhfa.no/praksiseksampler/friskuser-i-farta-i-bamble-kommune/>

BUA and similar arrangements: Loan of sports and outdoor equipment

Provider: BUA¹³ Levanger, which is a partnership between Levanger municipality, LevaFro AS,¹⁴ NAV Levanger (Job Centre), Levanger Volunteer Centre and Levanger Sports Council.

Geographical level: Local; Levanger municipality. Similar projects across the country.

Purpose/aim: BUA Levanger's aim is to get inhabitants of all ages out and involved in more varied activity, with special focus on children on young people. BUA's vision is that all young people will regularly be able to do physical exercise without increased costs.

Target groups: All age groups but especially children and young people.

Time period: 2014 – to date.

Method: BUA Levanger is like a library for borrowing sports and leisure equipment. The equipment includes cross-country and slalom ski equipment, ice-skates, sledges, tents, bicycles, tricycles, bike trailers for carrying children, skateboards, roller skates/rollerblades, protective equipment, helmets, canoes, fishing equipment, life jackets, games etc.

Cost: All loans and equipment are free. BUA is owned and operated by municipalities, sports teams and associations. The equipment is mainly purchased new with funds from foundations or public subsidy schemes, while some equipment is donated by private individuals. BUA is a non-profit, voluntary, nationwide organization. It was founded in 2014 by social entrepreneurs, who wanted to help more children and young people become more physically active. BUA also aims to improve public health, contribute to reducing social inequalities and reducing consumption.

Effect: Not shown, but the BUA-network consists of 152 lending projects in 126 municipalities where 126 lending projects are up and running while 26 are being established.

Evaluation: Not shown.

References: <https://www.bua.io/bua-levanger/>; <https://www.bua.io/artikkel/om-oss>

¹³ "Bua" means guard-house, shack, shed or storage room.

¹⁴ LevaFro is an adapted workplace, which offers work training for people who could not otherwise use work services without adaptation.

The “Activity ToolBox”

Provider: National Centre for Food, Health and Physical Activity commissioned by the Directorate of Health.

Geographical level: National. Use of the activity toolbox is voluntary.

Purpose/aim: Pleasure and success in movement, and that everyone can take part.

Target groups: Staff in schools; kindergarten employees, staff working at after-school care centres and others who want tips for physical activity in everyday life.

Time period: Not given.

Method: The activity box consists of a digital activity bank containing activities and exercises for use for daily physical activity in kindergarten, school, physical education and at after-school care. The activity box is operated by the National Centre for Food, Health and Physical Activity, on behalf of the Directorate of Education. The activity box contains different activities for children and should facilitate regular/daily physical activity. Users can choose between different activities based on the age of the children (e.g. 0-2 years; 3-5 years), the exercise environment (e.g. open space; mountain areas, forest and field; snow/ice; indoor space), the type of activity (basic exercise; coordination; strength; endurance and mobility), multidisciplinary activities (focus on communication, counting, interaction, digital expertise; exploration and creativity) and activity form (ball activities, outdoor activities; games and relays; music and dance activities; orienteering; water activities; winter activities and adapted activities).

Cost: The activity box is openly available to everyone, and free to use.

Effect: Not given.

Evaluation: The measure has not been evaluated, but the content has been reviewed and quality assured by the National Centre for Food, Health and Physical Activity, in cooperation with the Inland University College.

References: <https://aktivitetskassen.no/om/> ; <https://mhfa.no/fysisk-aktivitet-i-barnehagen--ideer-og-erfaringer>

Barriers that can prevent effective implementation of measures and possible strategies to overcome these

Through the work on this report, we have found many measures with promising potential. The main challenge, however, is that most measures lack good quality evaluation studies. This emphasises the importance a greater degree of testing and evaluation of measures, so that we can strengthen the knowledge base. In addition, requested and widely used measures should be evaluated scientifically.

Some of the challenges associated with *implementing* preventive measures in kindergarten are that implementation is often highly dependent on the employees of the kindergarten and the educational environment. Sometimes the measure relies on a single "dedicated" individual, and thus becomes very person dependent. Experience shows that many measures "die out" when the project period is over, when a dedicated person leaves or when the experts go home. This can be rectified by entrenching the project both in the management of the kindergarten and in the human resources group, so that employees experience support from management, and have enough time and resources both to implement measures, and to maintain those that have a good effect.

Another challenge is that it is often difficult for kindergarten employees to implement new measures, and implementation can come at the expense of other disciplines or priorities in kindergarten. Most kindergartens have limited staff resources and limited finances, and implementing new measures requires both time and resources.

Several studies have looked at factors that could prevent the effective implementation of measures, and possible strategies for overcoming these barriers: In 2011, the Directorate of Health surveyed kindergartens' work on diet, physical activity and environmental health protection. The survey showed that the biggest barriers to good meals in kindergartens were low staffing, staff skills on food, nutrition and health, and time. Many kindergartens also had limited facilities and lacked equipment to prepare food. The survey showed that it was important to anchor work on food, including food brought in from home, to the kindergarten's annual plan (Directorate of Health, 2012). Surveys have shown that kindergartens that do this

have healthier meals than kindergartens that do not anchor the work on food and meals in the annual plan (Norwegian Ministries, 2017).

According to Kantar (2016), the kindergarten's attitudes towards food and diet are the main drivers of a healthy diet in kindergarten, while employees' knowledge and expertise is the second biggest driver. This requires that the education of kindergarten teachers focuses enough on diet, physical activity and health, and that the employees in the kindergarten either have professional competence from their education, or can acquire knowledge, skills and expertise while in work.

In 2018, the Norwegian Diet and Nutrition Association & the Norwegian Consumer Council presented examples of kindergartens that have succeeded in providing children with a healthy and varied diet. They also presented success criteria for achieving good food care for the youngest and point out one factor that was consistent among the kindergartens that succeeded: anchoring the theme in the organisation's management, whether it was the management of the individual kindergarten, in the municipality or in the kindergarten chain for private kindergartens. When management anchoring is in place, kitchen facilities, employee competence building and money for raw materials are prioritised (The Norwegian Diet and Nutrition Association & the Norwegian Consumer Council, 2018, p. 6).

Johannessen et al (2018) examined the experiences of kindergarten employees in implementing a multi-component intervention that, among other things, would promote healthy meal practice among kindergarten staff and parents. They reported several challenges related to the implementation, including the meal principles that were part of the intervention, to unfamiliar situations when the children were going to eat. This can be said to be an undesirable effect of an intervention. Kindergarten staff also expressed that cooking other food was time-consuming and left less time for other tasks. The researchers concluded that the intervention created several challenges related to cooking and meal habits and practices, and that it is necessary to have sufficient time and resources to cook if kindergarten is to be a suitable setting for promoting good food and meal habits for young children (Johannessen et al., 2018).

Himberg-Sundet et al (2019a) found that kindergartens that collect food money from parents served a greater variety of vegetables, and that written guidelines on what food and drink to offer in kindergarten led to the children eating more vegetables. In other words, this study emphasises the need for sufficient financial resources to provide healthy and varied food.

Himberg-Sundet et al (2019b) also studied the working environment and culture in Norwegian kindergartens in connection with food and meals. They found that perceived *commitment* to the organisation and support from management were two key factors in the working environment and work culture, and recommended that future interventions must address these factors, as they were associated with a more beneficial food and meal practices among kindergarten staff.

The project "Good Habits Start Early" in Trøndelag concluded that one of their success criteria was that the intervention was free for participating kindergartens. This applied to both the equipment the kindergartens received, the courses they were offered, and the support they received from the project coordinator. The project coordinator emphasized that *all* employees in the kindergarten must be involved if similar measures are to have an effect. She also pointed out that information must be easily accessible and free for all participants. This is in line with the findings of Øvreås et al, who found that the following factors seem to have an impact on successful implementation: inclusion of the entire staff group, staff co-ownership of the project and the dissemination of practical ideas from the project managers (Øvreås et al., 2020).

The "Good Habits Start Early" project also emphasized the importance of anchoring the work on diet and physical activity in the framework plan, creating dietary and activity groups, self-assessment of physical activity and diet in kindergarten, parental involvement and focus on the physical environment inside kindergartens (National Centre for Food, Health and Physical Activity, 2018b).

In 2020, the JANPA WP6 consortium ¹⁵ examined various policy options to improve children's nutrition by targeting the food environment in and around kindergartens and schools. They concluded that in order to take effective measures, countries must combine various, mutually reinforcing policies, including providing healthy food, reducing the availability of unhealthy foods, limiting the marketing of less healthy foods and promoting education. The message conveyed must be coherent, and a wide range of stakeholders and sectors must be engaged (Kovacs et al., 2020). In other words, there is a need for a long-term and coherent effort from many stakeholders to create healthier food environments for children.

Success factors for successful implementation of initiatives

In conclusion, it seems to be important that *all* employees in the kindergarten are included in the measure to be implemented. They need to have sufficient competence building and understand why the measure or measures are being implemented. The measures must be entrenched in management, among the employees and in the kindergarten's planning system.

Kindergarten staff need to experience *ownership* of the measures. It is therefore important that the measures are close to practice and contextually adapted, which can be challenging for highly structured measures and measures based on impact studies. Sufficient time, knowledge, and financial resources are important, as changing habits is demanding. Employees therefore need support.

Experience from measures already implemented indicates that competence-building among employees, with a focus on practical skills in addition to theory, seem to be important. In this context, it may be useful to make use of what Hnatiuk et al. (2019) call "*hands-on*" workshops, where employees are allowed to carry out practical activities, as this seems to increase employees' knowledge of children's physical activity. Through practical learning, kindergarten employees gain more experience, so that the activities can become routine and incorporated into the ordinary situation of the kindergarten.

¹⁵ JANPA: Joint Action on Nutrition and Physical Activity

Kindergartens must also dare to prioritise certain areas, and perhaps downgrade others - at least for a time – and this must be a conscious prioritisation both for employees and management. It must be taken into account that implementing new initiatives requires time and resources, and that no-one can do everything at the same time.

Sepp et al (2016) conducted a literature review on the development of children's taste. As part of this literature review, they also looked at the measures that could promote good eating habits among children and young people. They concluded that broad and long-term measures that take into account children's physiological, social and educational needs are most likely to succeed. For this work to be perceived as meaningful by the children, it is important that they are invited in and allowed to participate. By involving both children and employees in the planning of food and meals, and by taking account of children's interests, meals can become a natural part of the educational activities in kindergarten (Sepp et al., 2016).

Measures aimed at parents and opportunities to reduce social inequality in health

As mentioned, the Directorate of Health has developed and published several tools that provide information to parents about what a healthy diet consists of (cf. the description of measure 1). The Directorate of Health and the Directorate of Children, Youth and Family Affairs has also developed the themed booklet "Children and physical activity – with emphasis on the age group 0-16 years": The booklet is digitally available and addresses parents as role models for physical activity, and advises on active leisure, etc. (Mjaavatn & Fjørtoft, 2008, chapter 3).

As with kindergartens, however, the challenge is often that those parents who have the greatest need to change lifestyle habits are least interested in measures. Thus, measures where parental participation is voluntary may tend to increase social inequality in health. How can this be counteracted? Measures that focus on system changes and target the entire population appear to be beneficial in helping to reduce social inequality in diet (Norwegian Ministries, 2017). This can be changing factors such as price, availability of foods, the composition of food stuffs etc.

The University of Agder has tested out several e-health interventions aimed at parents. The advantage of such interventions is that they can reach a large group using relatively limited resources. In the Food4toddlers study, the researchers found that the use of the digital intervention varied according to parents' educational attainment and how many children the family had: parents with more than four years of university education, and with only one child, used the web page more often than parents with shorter education and with more children (Røed et al., 2020). This shows some of the challenge of such measures; that they can increase social inequalities in health-related behaviour.

Røed et al used self-recruitment via social media in their study and found that their participants had a significantly higher level of education than the national average. This is also a challenge. The more closely participants in such measures are followed up, the better the participation and implementation of the various modules in the intervention seem to be. Participants with low education seem to prefer personal follow-up in addition to e-health interventions, and studies that have included personal follow-up and/or follow-up by phone appear to have higher participation and implementation rates (Røed et al., 2020). However, this requires more time and resources and will increase the cost of the intervention.

Summary and conclusion

In this report we have presented various measures that have been implemented to improve the diet and increase the level of physical activity for children of kindergarten age (1-6 years). We have also highlighted some of the barriers that can prevent the effective implementation of such measures and suggested possible strategies to overcome them. Most of the measures we have found have the kindergarten as the setting and are primarily aimed at the staff. Some of these measures also have a parental component. Measures that reach all the children in kindergarten will have the potential to reduce social inequalities in diet and physical activity.

We have also presented various cooking classes that target parents, but for these we have less knowledge about the effect of the measures. There are also promising dietary measures aimed only at parents, particularly online measures, where the main challenge seems to be reaching more vulnerable groups.

When future decisions are made between different measures to improve the diet and/or increase the level of physical activity for children aged 1-6 years, we hope that the content of this report can help. In particular, we would encourage practitioners and decision-makers alike to evaluate any initiatives they use, preferably by measuring the direct impact on children's diet or physical activity levels both *before* and *after* the implementation. We also see that more studies are needed on how to reach vulnerable parent groups, thereby helping to reduce social inequalities in health through preventive measures, rather than increasing them.

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Attachment 1: Inclusion / exclusion criteria for selection of best practice measures

Selection of papers – first reading

-Does the abstract of the paper describe a measure / programme / course / tool (hereafter called “measure”) to improve the diet or degree / amount of physical activity for kindergarten children (1-6 years old)?

- If yes → include.
- If no → exclude.

-If the abstract describes a measure aiming to improve the diet or degree / amount of physical activity, where the abstract unequivocally shows that the target group does not consist of Norwegian children / a Norwegian setting, where the age group is wrong, or other, decisive demands / criteria:

- Exclude

-Important note: The setting for the measure could be both within the kindergarten and outside the kindergarten itself, as long as the measure is focussed on the pre-defined target groups: Kindergarten children themselves; kindergarten staff; parents / guardians / carers of children 1-6 years old and sports coaches working with children 1-6 years old.

Selection of papers – second reading

(Go through selected papers from first reading more thoroughly according to the following criteria)

- Measures should aim at improving the diet of kindergarten children and / or to increase their degree of physical activity.
- Measures should be directed towards kindergarten children themselves (1-6 years old); kindergarten staff; parents / guardians / carers of kindergarten children, and /or sports coaches working with children 1-6 years old.
 - If directed towards children; the age group should be 1-6 years old
 - Settings: Kindergartens, at home, leisure time activities; digital measures etc.
- The measure should be in current use, or should have been applied previously in a Norwegian setting (nationwide, regional or local setting)
 - Preferably: Measure should be in current use as per 2021.

- Measures that have been completed / terminated should also be included, if monitoring/ evaluation shows that the measure has been effective, or if experience, practice-based knowledge or professional judgment indicate that this is a measure with “promising potential”.
- In this report, our understanding of “promising potential” is there is a high probability that the measure will lead to improvements in diet and / or level of physical activity among kindergarten children /aged 1-6 years).
- The measure ought to have been evaluated / monitored.
 - This criterion was used in the first round of the second reading. Measures that were not monitored/ evaluated were not excluded, but stored separately, to be considered as measures with promising potential in the next round.

Exclusion criteria for measures presented in the report for module 1

-Measures focussing on children *older than* 6 years of age

-Measures that *do not focus* on diet / physical activity

-Measures *exclusively* directed at specific sub-groups of children (such as children with special needs; children with severe disabilities; children with severe food allergies; children with severe over- and / or underweight). Such groups may be included in a broader and more general target group, but we are aiming at population-wide measures in this report; hence excluding measures tailor-made for sub-groups with particular needs.

Attachment 2 Search strategy for the first literature search

Database: OVID MEDLINE

Date: 17.01.2021

Hits: 198

#	Searches	Results
1	Child, Preschool/ or exp Child Day Care Centers/	932873
2	(daycare cent* or day care cent* or kindergarten* or nurser* or preschool* or pre-school* or "early childhood education and care").ti,ab,kf.	54143
3	1 or 2	953304
4	Diet/ or Diet, Healthy/ or exp Exercise/	358962
5	(physical* activ* or exercis*).ti,ab,kf.	404558
6	(diet* or food or nutrition* or nutrient intake* or (healthy adj2 eating) or ((vegetable* or fruit? or fish) adj2 intake?)).ti,ab,kf.	1144743
7	4 or 5 or 6	1583523
8	3 and	757337
9	(norway* or norwegian* or svalbard).ti,ab,kf. or Norway/	61996
10	8 and	9237
11	limit 10 to yr="2000-current"	198

Database: ERIC (EBSCO)

Date: 17.01.2021

Hits: 19 [1 relevant article was imported]

#	Query	Results
S11	S9 AND S10	19
S10	TX norway* or norwegian* or svalbard	5,839
S9	S7 AND S8	2,379
S8	S3 OR S4 OR S5 OR S6	61,502
S7	S1 OR S2	75,430
S6	TI ((diet* or food or nutrition* or nutrient-intake* or (healthy N1 eating) or meal# Or vegetable* or fruit# or fish) N1 intake#) OR AB ((diet* or food or nutrition* or nutrient-intake* or (healthy N1 eating) or meal# Or vegetable* or fruit# or fish) N1 intake#) OR SU ((diet* or food or nutrition* or nutrient-intake* or (healthy N1 eating) or meal# Or vegetable* or fruit# or fish) N1 intake#))	649

- S5 TI (((physical* W0 activ*) or exercis*)) OR AB (((physical* W0 activ*) or exercis*)) OR SU (((physical* W0 activ*) or exercis*)) 42,858
- S4 DE "Physical Activities" OR DE "Athletics" OR DE "Dance" OR DE "Exercise" 17,259
- S3 DE "Eating Habits" OR DE "Food" OR DE "Food Standards" OR DE "Nutrition" 12,602
- S2 TI ((daycare-cent* or day-care-cent* or kindergarten* or nurser* or preschool* or pre-school* or "early childhood education and care")) OR AB ((daycare-cent* or day-care-cent* or kindergarten* or nurser* or preschool* or pre-school* or "early childhood education and care")) OR SU ((daycare-cent* or day-care-cent* or kindergarten* or nurser* or preschool* or pre-school* or "early childhood education and care")) 75,430
- S1 DE "Preschool Education" OR DE "Preschool Evaluation" OR DE "Preschool Children" OR DE "Preschool Teachers" OR DE "Nursery Schools" 45,488

Word search (Ordsøk): barnehage* AND (kosthold OR måltid OR diett OR ernæring OR "Fysisk aktivitet")

Database: CRISTIN

Date: 15.01.2021

Manual search

Search terms: barnehage måltid (kindergarten meal)

Search terms: Barnehage kosthold (kindergarten diet)

Search terms: barnehage "fysisk aktivitet" (kindergarten «physical activity»)

This search resulted in 24 hits, all of which have been gone through manually and searched for measures / interventions / programmes to improve diet and / or level of physical activity for kindergarten children.

Attachment 3 Search strategy supplementary literature search

Database(s): Ovid MEDLINE(R) and Epub Ahead of Print, In-Process, In-Data-Review & Other Non-Indexed Citations and Daily 1946 to February 28, 2021

Search Strategy:

#	Searches	Results
1	Child, Preschool/ or exp Child Day Care Centers/	937035
2	(daycare cent* or day care cent* or kindergarten* or nurser* or preschool* or pre-school* or "early childhood education and care").ti,ab,kf.	54403
3	1 or 2	957493
4	Diet/ or Diet, Healthy/ or exp Exercise/	362267
5	(physical* activ* or exercis*).ti,ab,kf.	406658
6	(diet* or food or nutrition* or nutrient intake* or (healthy adj2 eating) or ((vegetable* or fruit? or fish) adj2 intake?)).ti,ab,kf.	1151110
7	4 or 5 or 6	1592262
8	3 and 7	757735
9	(norway* or norwegian* or svalbard).ti,ab,kf. or Norway/	62151
10	8 and 9	9239
11	limit 10 to yr="2000-current"200	
12	Child, Preschool/ or exp Child Day Care Centers/	937035
13	(daycare cent* or day care cent* or kindergarten* or nurser* or preschool* or pre-school* or "early childhood education and care" or early childhood or toddler* or small child*).ti,ab,kf.	93005
14	("one year old" or "two year old" or "three year old" or "four year old" or "five year old" or "six year old" or "seven year old" or "eight year old" or "nine year old" or "ten year old" or "eleven year old" or "twelve year old" or "thirteen year old" or "fourteen year old" or "fifteen year old" or "sixteen year old" or "seventeen year old" or "eighteen year old" or "1 year old" or "2 year old" or "3 year old" or "4 year old" or "5 year old" or "6 year old" or "two years old" or "three years old" or "four years old" or	

- "five years old" or "six years old" or "2 years old" or "3 years old" or "4 years old" or "5 years old" or "6 years old").ti,ab,kf. 84964
- 15 (age? adj3 (one? or two? or three? or four? or five? or six? or 1- or 2- or 3- or 4- or 5- or 6- or 1# month? or 2# month? or 3#? month?)).ti,ab,kf. 466793
- 16 12 or 13 or 14 or 15 1330445
- 17 Diet/ or Diet, Healthy/ or Food/ or Fruit/ or Vegetables/ 248450
- 18 (diet* or food or nutrition* or (health* adj2 eat*) or vegetable* or fruit? or fish or cook? or cooking).ti,ab,kf. 1379410
- 19 17 or 18 1432550
- 20 16 and 19 89946
- 21 (norway* or norwegian* or svalbard).ti,ab,kf. or Norway/ 62151
- 22 20 and 21 418
- 23 limit 22 to yr="2000-current"335
- 24 23 not 11 175