



Western Norway
University of
Applied Sciences

Abstract Book

Conference on school meals
Bergen 8 - 10 June 2022



Nasjonalt senter
for mat, helse og
fysisk aktivitet



Western Norway
University of
Applied Sciences



**CENTRE FOR
NUTRITION**



**The Research Council
of Norway**

NIPH

Norwegian Institute of Public Health

With funding from
The Research Council of Norway

WEDNESDAY

Keynote speakers

Lorrene Ritchie, Ph.D. Director of the Nutrition Policy Institute (NPI), The University of California Division of Agriculture and Natural Resources, USA.

Impact of school meals on student nutrition and health: Experiences from the United States

The National School Lunch Program in the U.S. began in 1946, followed by the School Breakfast Program in 1966. Since then, several other school nutrition programs have been added, including summer feeding, afterschool snacks, and fresh fruit and vegetable snacks. The federal government provides cash and commodity foods to schools for serving meals meeting nutrition requirements. Depending on family resources, students receive meals at no cost, for a reduced price, or pay full price. Schools with a relatively large proportion of students from families with low income can qualify to provide free meals to all students. Prior to the pandemic, an average of 30 million children received school lunch each school day, the majority for free or at a reduced price. During the pandemic, free school meals were provided to all students regardless of income and several states have adopted new policy requiring all schools provide universal free breakfast and lunch beginning the fall of 2022. This presentation will focus on the history of the major school meal programs in the U.S., how they have evolved over time in terms of who is served and how, and the impacts on student food security, diet quality, academic performance, and health. School meals have been shown to be the healthiest options for students in the U.S., thanks in large part to legislation passed in 2010 to reform the nutrition standards, but challenges - politically, financially, logistically and nutritionally - remain. Limitations and lessons learned to inform improvements to school meal programs in the future will be discussed.

Petur Bendik Juliusson, PhD, Professor, Bergen, Norway.

Child obesity in Norway

Juliusson is a professor at the Department of Clinical Science, University of Bergen, Norway, director, Department of Health Registry Research and Development, Norwegian Institute of Public Health and senior consultant at the Department of Pediatrics, Haukeland University Hospital, Bergen, Norway. Juliusson does research on childhood growth, pubertal development and overweight and obesity in children and adolescents. In his presentation, he will discuss trends in the prevalence of overweight and obesity, and the current treatment of severe obesity in children and adolescence.

Lotte Lauritzen, prof. University of Copenhagen, Denmark

The effect of marine omega-3 fatty acids on cognitive performance in children

School diet programs improve the nutritional quality of children's diet and several studies show that diet quality is associated with school performance. We found improved reading skills in a trial that compared nutritionally balanced school meals with usual packed lunches. Major dietary changes in schools are hard to achieve, but focus on specific foods may be feasible and our study indicates that fish is a good candidate. Marine n-3 fatty acids (n-3LCPUFA) are accreted in brain areas involved in cognitive and socioemotional function and n-3LCPUFA deficiency affects neurological outcomes in rodents. Maternal seafood intake is associated with improved infant neuro-development and studies indicate effects on cognitive and behavioral outcomes in infants up to 2 years after maternal n-3LCPUFA supplementation. A number of studies have shown effects of fish oil supplementation on cognitive and socioemotional outcomes in children. A few randomized trials in healthy preschool children and adolescents have reported beneficial effects of fish consumption on cognitive performance but found no benefits on intelligence or mental health. Results from a trial, where we compared effects of oily fish and poultry (~300 g/week) on domain-specific cognitive and socioemotional function in schoolchildren showed dose-dependent increases in cognitive performance, driven by improvements in attention and cognitive flexibility. The fish intervention also reduced parent-rated socioemotional difficulties, primarily internalizing behavior. Some studies have reported potential adverse and sex-specific effects, which need to be explored. Moreover, although the studies show that n-3LCPUFA can affect brain function and support fish recommendations, long-term implications for educational attainments remain uncertain.

Jorunn Randby (MSc), Department of Nutrition, University of Oslo/Department of Child and Adolescent Health, Norwegian Directorate of Health

Implementation and compliance of the national guidelines for food and meals in the school

Background: Norwegian municipalities' responsibility to work systematically to promote and protect health is laid out in legislation. National guidelines for school meals are a promising tool in this regard. Implementation is, however, often inadequate. This project aimed to understand determinants for meal practices, develop questionnaires to measure guideline compliance, and test a multi-strategy intervention to increase guideline compliance.

Methods: Interviews with school staff and children were conducted to study implementation barriers and enablers. Cognitive interviews and a test-retest reliability study were carried out to develop and evaluate questionnaires to assess compliance. Effectiveness and implementation of an intervention to increase guideline adherence were evaluated through a non-randomized controlled trial.

Results: Implementation barriers were identified at macro, school and individual level, and included weak mandates and administrative leadership for school meals. Whole-school discussions enabled implementation. Cognitive interviews supported the development of questionnaires to evaluate guideline compliance, subsequently found sufficiently reliable

for use in evaluation and research. An implementation strategy based on training for appointed teachers and facilitation of school-based workshops increased guideline compliance.

Conclusion: Inadequate implementation of national school meal guidelines undermines their potential contribution to public health work. Low-intensity strategies that address implementation barriers and involve teachers directly, may strengthen schools' public health role.

1A Parallel session: Health and Nutrition

Hege Wergedahl

Nordic school meals and effect on classroom learning behaviour

Wergedahl H^{1*}, Hörnell, A², Olafsdottir AS³, Lagström H⁴

¹ Western Norway University of Applied Sciences, Bergen, Norway

² Umeå University, Sweden

³ Iceland University, Iceland

⁴ Turku University, Finland

* Corresponding author: hwe@hvl.no

Academic achievement is an indicator of future outcome and life opportunities. Several factors may affect children's academic performance. Some evidence supports an independent effect of dietary behaviours on academic performance, but the studies have focused mostly on food adequacy, intake of micronutrients and breakfast consumption. Most studies focused on cognition or academic achievement; while few studies examined on-task behaviour, despite its relevance for academic performance.

The present study is part of the cross-sectional Nordic project "Prospects for promoting health and performance by school meals in Nordic countries" (ProMeal), with pupils from Norway, Sweden, Finland and Iceland, totally 837 pupils aged 10 years. We measured dietary intake at lunch, classroom learning behaviour 1-2 hours after lunch (on-task or off-task), and self-reported breakfast intake and sleep duration for 5 days.

The results showed a small negative correlation between intake of added sugar and learning behaviour. Pupils with low or no intake of added sugar had significantly higher on-task learning behaviour compared to those with a high intake of added sugar. However, the most prominent effects on classroom learning behaviour were found with breakfast consumption, where pupils eating breakfast showed a significantly higher on-task learning behaviour compared to students who did not eat breakfast on the day of the classroom learning behaviour measurement.

In conclusion, there seem to be a relation between dietary intake and classroom learning behaviour, but the most important factor seems to be the breakfast consumption.

Neha Kishan Lalchadani

Sneak Peek: Lunchbox contents of preschool and primary school children in South Australia

Lalchadani NK^{1*}, Hendrikx J², Giles L¹, Miller C^{1,3}, Crabb S¹, Hume Clare¹

¹ School of Public Health, University of Adelaide, Adelaide 5000, Australia

² KESAB environmental solutions, Flinders Park, 5025, Australia

³ Health Policy Centre, South Australian Health and Medical Research Institute (SAHMRI), Adelaide 5000, Australia

*Corresponding author: neha.lalchandani@adelaide.edu.au

In Australia, home-packed lunchboxes are the predominant source of children's nutrition during the school day. They are also a source of avoidable packaging and waste. The objective of this observational and exploratory study was to determine the contents of packed lunches of South Australian pre- and primary school children, by examining nutritional quality, packaging, and leftover food characteristics.

Lunchboxes were photographed at two time points i.e. pre- and post- snack/lunch. Contents were coded into a novel audit tool designed using REDCap which captured the range of unique food/beverage items. Approximate amount of leftover food was also recorded. To determine the nutritional quality of lunchboxes, food and drinks were classified into Green/Amber/Red categories based on local and national dietary guidelines and the NOVA food classification system. The same classification system was applied to the packaging waste component of the study based on the local bin system. Coded data was reported descriptively.

14 preschools and 9 primary schools in low (n=8), medium (n=7), and high (n=8) socioeconomic areas of Adelaide, South Australia were part of this study. In total, 681 lunchboxes were audited across 23 sites. At least one item from each of these food/beverage categories were found in lunchboxes: Vegetables (25.7%), Fruits (77.8%), Grains/Cereals (91.9%), Protein and alternatives (9.3%), Dairy and alternatives (32%), Snacks or extras (60.8%), Mixed meals (1.2%), Drinks (4.7%). Lunchboxes of preschool children contained more 'nude' food variety compared with primary school children that had a higher proportion of packaged discretionary foods. Overall, there was a high proportion of single use packaging in lunchboxes and considerable proportion of food waste.

This lunchbox audit study helps quantify contents of school lunchboxes and provides an indication of food and packaging characteristics using the traffic light system. This is an important first step towards developing interventions to improve the nutritional quality and sustainability of school lunchboxes for children's health and planetary well-being.

Siri Løvsjø Solberg

Evaluating health and sustainability profile of school meals through consumption data analysis

Solberg SL^{1*}, Brenne E²

¹ Matvalget, Norway

² Department of public health, Viken County, Norway

*Corresponding author: siri.solberg@matvalget.no

Schools in Viken county should offer healthy and sustainable food to students. In 2021, the county municipality started a project of 13 schools/canteens to implement free school meals. The schools/canteens have received guidance from Matvalget. To monitor and evaluate the health and sustainability profile, we developed an analysis tool for school consumption data. We collect data on all food and drink products purchased by the canteens.

All purchases are then classified in four variables; HDir (yes, limit, no), organic (organic, conventional), extent of industrial processing as in the NOVA classification (minimally processed, culinary ingredient, processed, ultraprocessed), and food group (eg. vegetables, sugars-sweetened beverages (SSBs)).

Each school is profiled every third month, showing how their purchases distributes in each variable (NOK). Over 4000 different food and drink products are classified, and we have profiles for 13 schools since January 2020. Profiles varies between schools. Schools spend up to 50 % of their purchases on beverages, most of which are SSBs. There is a potential to increase consumption of vegetables, fruits, legumes, whole grains, fish and seafood. 10/13 schools spend more than 15% on organic food.

Three schools have worked towards healthy, sustainable canteens since 2018, with profiles that are in adherence with HDir, purchase more than 25% organic foods and use few ultra-processed foods.

The analysis are a useful tool for monitoring and evaluating sustainability and health profiles of school meals. In addition, the analysis have proven a tool for invoking change. For example, one school decided to stop all sales of SSBs after seeing their profile on adherence to HDir.

Jakub Adamczewski

The school lunch of the future. How Polish children imagine meals in 2050?

Adamczewski J^{1*}, Nymś-Gorna A²

¹ Faculty of Educational Studies, Adam Mickiewicz University in Poznan, Poland

² Faculty of Sociology, Adam Mickiewicz University in Poznan, Poland

*Corresponding author: Adamczewski J

School lunches are consumed by millions of children every day from the late XVIII century. There are yet limited number of countries that serve free or reduced price school meals to all pupils in compulsory education (i.e. England, Sweden, Finland, Estonia, India, China). Some of the countries do not provide school meal arrangement with food providers and

children typically bring packed lunch from home (i.e. Norway, Denmark) or can buy from a private company in partnership with the school. In many cases, the free lunch is only given free to the children from the disadvantage social background (the USA, Japan). Poland is an interesting example in this case, as all of the models mentioned above are in use and the decision in many cases is up to the school and parents committee.

Why is it important to talk about the future of school meals? We are convinced that by 2050, world population may experience climate change (or even apocalypse), a shortage of food, poverty, new school models or economic crisis. Are we all aware of that? As a consequence, we want to get the children and teachers attention to their eating habits and vision of the future. We were curious if the school meals created by them in our study will differ from their present food choices or not. What is more, we tried to examine if those future school meals are possible to appear and be edible for humans. The current research on the future of school meals is almost non-existing as the potential data has not been investigated yet.

The abstract builds on a national creativity project we have conducted with the partnership of over a dozen primary schools in Poland. Together with the primary school teachers we asked children (age 9) to design the school lunch that will be served in Polish schools in 2050. First, we sent the worksheet on which children could create weekly school bill of fare and draw its picture. Next to that, children were asked to mark their answer (yes/no) with tick for the following questions: Is your lunch easy to make? Is it healthy? At the end, they needed to identify if their lunch can consist any food allergies.

The final stage of our study was to analysis the worksheets and pick out the common aspects of future lunch. Based on the papers, we created the weekly school lunch schedule that can be interested to see for other researchers. The findings from our study show how qualitative research in this type of educational setting has the potential to contribute knowledge and understanding of children's perspective on the school meals. Although future research with international comparison could be even more comprehensive. The creativity mission taken by the kids gave as insight in their planning skills and general knowledge about healthy eating habits.

1B Parallel session: Barriers and Facilitators

Laura Terragni

Changing meals practices in Norwegian school: challenges in implementing school meals programs fully realizing their potential

Terragni L^{1*}, Mauer S¹, Prestbakmo M¹, Torheim LE¹

¹ Oslo Metropolitan University, Norway

* Corresponding author: lterragn@oslomet.no

Norway is one of the few European countries not having a national program for school meal provision. However, in the last years, attempts have been made at the local and regional levels to organize school meal provisions. Evaluation of these experiences provides contrasting results. This study aims to provide an understanding of the challenges met when establishing a school meals system.

This study is based on qualitative studies conducted in 14 primary and lower secondary schools in Norway, providing school meals. Observation and qualitative interviews with teachers, children, and parents have been conducted. The data were analyzed adopting a thematic approach.

Results from our studies indicate that common schools' meals provide an important arena for socialization. However, offering a meal may not be enough for assuring children's participation. School meals face competitions both with the traditional packed lunch and, for the older children, with opportunities to buy food outside school. Meeting children's - and parents' - preferences regarding taste and quality. School meals seem also to struggle with long terms plans; as programs are to a large degree based on the efforts of highly motivated teachers and few resources.

School meals in Norway have a low degree of institutionalization. Efforts need to be made in establishing new practices. As offering school meals can greatly contribute to children's health, reduce social inequalities in diets, and promote sustainability, we need more knowledge about how to meet the challenges related to implementing school meals programs fully realizing their potential.

Aija Laitinen

The "Tasty School" Model Is Feasible for Food Education in Primary Schools

Laitinen LA^{1*}, Antikainen a¹, Mikkonen SA², Kähkönen K¹, Talvia S³, Varjonen S⁴, Paavola S⁴, Docent Karhunen L¹, Tilles-Tirkkonen T¹

¹ Department of Clinical Nutrition, Institute of Public Health and Clinical Nutrition, University of Eastern Finland, 70211 Kuopio, Finland

² Department of Applied Physics and Department of Environmental and Biological Sciences, University of Eastern Finland, 70211 Kuopio, Finland

³ School of Applied Educational Science and Teacher Education, University of Eastern Finland, 80101 Joensuu, Finland

⁴ Finnish Society for Food Education Ruukku, 00620 Helsinki, Finland

* Corresponding author: aija.laitinen@uef.fi

Background: The "Tasty School" is a tailored teacher-delivered food education model for primary schools in Finland. The aim of the current study was to investigate the feasibility of the Tasty School model in primary schools. Furthermore, the aim was to assess changes during the intervention in the class teachers' perspectives and experiences related to food education and school dining.

Methods: Quasi-experimental study with intervention and control groups. A total of 130 class teachers from 15 intervention and 10 control schools from five municipalities in Finland participated in the study during one school year. The theoretical framework of acceptability (TFA) was utilized to evaluate feasibility using frequencies. The comparison data were analyzed with a mixed effects model for repeated measures to account for the intervention effects and selected standardizing effects.

Results: Teachers reported the model being highly acceptable and easily integrated into the school environment. Support from principals and colleagues was the most important facilitator of food education, and lack of time was the barrier. Teachers at the intervention

schools were more likely to consider school meals healthy after the intervention, and they reported having sufficient materials and supplies for food education.

Conclusions: The Tasty School was shown to be a feasible model for food education in primary schools. The current study especially found that the whole school commitment and principals' role are crucial in the implementation of food education. The factors that support the implementation must be strengthened and efforts must be made to reduce the barriers.

Kaisa Kähkönen

Implementation of food education in school environments improves pupils' eating patterns and social participation in school dining

Kähkönen K^{1*}, Laitinen LA¹, Antikainen A¹, Mikkonen S¹, Talvia S¹, Varjonen S¹, Paavola S¹, Karhunen L¹, Tilles-Tirkkonen T¹

¹ University of Eastern Finland, Finnish Society for Food Education, Ruukku, Finland

*Corresponding author: kaisa.kahkonen@uef.fi

A school could be an effective arena for food education. The aim of the study was to investigate pupils' eating patterns and experiences related to school dining and the effects of Tasty School food education and its implementation intensity.

A total of 25 primary schools and 1480 pupils aged 8-12 years from five municipalities in Finland participated in the quasi-experimental study during one school year. The intervention schools implemented the Tasty School food education model. The data were analyzed with a mixed-effects model for repeated measures accounting for the implementation intensity and selected standardizing effects.

A total of 10% of pupils ate a balanced school meal every school day, and 46% could be classified as eating competently at baseline. Percentages of pupils eating a balanced school meal increased in schools where food education was implemented actively. In addition, pupils' experience of social participation in school dining strengthened in schools where the Tasty School model was implemented.

Healthy eating patterns could be promoted by active implementation of food education in primary schools. The Tasty School offers a promising tool for developing healthy eating patterns and increasing social participation among pupils.

Implementation of food education in school environments improves pupils' eating patterns and social participation in school dining.

Hillevi prell

"I did not go to college for three years to cook porridge": Barriers and possibilities to promote healthy eating habits in preschool

Prell H^{1*}, Larsson C¹

¹ Department of Food and Nutrition and Sport Science, University of Gothenburg, Sweden

* Corresponding author: hillevi.prell@ped.gu.se

Preschool is an important arena for developing healthy eating habits among children, and as such a pedagogic opportunity for health promotion. However, to what extent food and meals are being used as a resource for pedagogic activities varies in regard to methodological approaches, degree and success. The aim was to explore preschool staffs' notions and experiences regarding perceived barriers and possibilities to promote healthy eating habits among children.

Seven semi-structured interviews (five in pairs, and two individual) were conducted with staff with different professional backgrounds (pedagogues, preschool manager, chef and food service manager). Qualitative data analysis, framed by social learning theory, was carried out using NVivo 12 Pro.

Lack of interest, insufficient knowledge regarding food and nutrition and a stressful environment acted as salient barriers for pedagogues. The perceived barriers were related to the pedagogical activities, meal service and organizational border processes. The competence among meal service staff were questioned and political decisions complicated the promotion of healthy eating. Communication between pedagogues and meal service staff was considered an obstacle, due to lack of management, meetings and approaches in common. Participants claimed that possibilities to reflect on food and meals together, across organizational and professional borders, would be fruitful and contribute to improved communication and the potential to regard food and meals as a pedagogic activity. Thus, a supportive management, an engaging meal environment and education in food and health, is required.

To promote healthy eating habits in preschool, cooperation between pedagogues and meal services needs to be underpinned.

THURSDAY

Keynote speakers

Inger Johanne Lyngø, Dr.art. Food Lessons, Oslo Met/SIFO, Norway

The Oslo-Breakfast: Rethinking and Reshaping a Historical School Meal

From the 1880s, children of Oslo (then Kristiania) were offered a hot meal at school. This meal was strongly criticized by dr. med. Carl Schiøtz, who since 1918 was Head of the school health service in Oslo. Instead of dinner at noon, from 1932 onwards school children were offered a meal consisting of bread (sandwiches), milk in glass or in bottles, slices of oranges or carrot and severed before school day. In his view, this was an «optimal meal» containing all nutrients and vitamins young bodies needed. In addition, it was not

part of the poor relief, but of public health. The meal became a great success, and got the name «the Oslo-Breakfast».

It was a free meal, but parents had to apply. Protocols from the municipal schools, shows that participation never was 100 percent, not even in working class areas. The peak years were after WWII, but during the 1950s the Oslo-breakfast was replaced by a packed lunch [matpakka] consisted of the same ingredients. While the sandwiches and the fruit were the responsibility of the homes, the schools organized the milk. Since the 1950s this has been the Norwegian school meal. Matpakka has even got an emblematic status in Norwegian food culture.

Today this meal is strongly criticized and discussed. For decades, politicians have promised children and families a hot meal and a free lunch, but only exceptionally has this promise been realized, often with voluntary efforts.

In my presentation I will draw attention to the history of the Oslo-breakfast, show by examples how and why it became such a great success. I will also ask; what happens if we look at Matpakka as cultural heritage? Do we then want to throw it away or is it conceivable that it can be transformed and reshaped into new forms of practices?

Gurpinder Lalli, Phd. Associate professor in Education at School of Education, University of Wolverhampton, England

'Come dine with me!': Commensality and school mealtime'

School mealtime is a crucial part of the day in which children come together in which nourishment is prioritized. However, the social aspect of eating is underrepresented, and social learning is one area in which places a focus on the 'whole child'. So, what does it mean to educate? What is the purpose of school? What can be gained from social interaction during mealtime? These are the key questions under the microscope and ethnography enables me to unpack the social and cultural aspect of school mealtime.

Poster presentations

School meal acceptance and plate waste in Swiss school canteens

Rouchon P^{1*}, Bourcet C¹, Harms E¹

¹ Bern University of Applied Sciences BFH, School of Agricultural, Forest and Food Sciences HAFL

*Corresponding author: pauline.rouchon@bfh

Switzerland is not being spared from food waste. 14% of avoidable food waste occurs in the catering industry. Studies from other countries indicate that 110-130 g of a child's meal are wasted, which reveals a high potential to reduce food waste in school canteens. However, such data is not available in Switzerland. Therefore, a pilot study has been run to demonstrate the correlation between the acceptance of served meals and the amount of food waste in school canteens. Outcomes could help to develop measures to reduce food waste in Swiss school canteens.

Children (n = 564) who participated in two schools were aged between 7-12 years old. They evaluated in total 14 school lunches by rating their liking of each meal component on a 5-points smiley scale. Production quantities, table waste, and plate waste were weighted for each component.

On average, 28.2 % of food was wasted. Of this, 20.6 % was overproduction and 7.6 % plate waste. Vegetables and salad were significantly less liked and the most wasted components.

The research questions arise: How can children's preferences be considered in vegetable preparation to increase its consumption? How could portion sizes be considered in the lunch planning to avoid over-production? By enhancing palatability and age-related adequate adjustment of portion sizes, the amount of wasted food could be reduced. Close cooperation and coordination with kitchen managers are needed to address these questions.

Secondary school canteens' adherence to national guidelines for school-based nutrition have little short-term impact on adolescents' dietary behavior: a non-randomized experimental study

Bottolfs M¹, Schmidt SS², Oellinggrath I³, Svendsen M⁴, Bratland-Sanda S²

¹ Faculty of Humanities, Sports and Educational Science, Department of Sports, Physical Education and Outdoor Studies, University of South-Eastern Norway, Campus Vestfold

² Faculty of Humanities, Sports and Educational Science, Department of Sports, Physical Education and Outdoor Studies, University of South-Eastern Norway, Campus Bø

³ Faculty of Health and Social Sciences, Department of Nursing and Health Sciences, University of South-Eastern Norway, Campus Porsgrunn

⁴ Section for Occupational medicine, Telemark Hospital, 3710 Skien

*Corresponding author: marthe.bottolfs@usn.no

We know that Norwegian adolescents have an overall diet with low intakes of wholegrain, fish, fruits and vegetable, and high intake of sugar. The purpose in the study was to examine secondary school canteens' adherence to national guidelines for school-based nutrition, and whether this affected the pupils' school and overall diet.

A non-randomized experimental pretest-posttest design with six intervention schools and nine control schools was conducted during school year 2017/2018. The intervention schools changed content in canteens according to the Norwegian national guidelines for school-based nutrition. Assessment included interviews with canteen staff (n=13) and survey among 8th grade pupils (n=611).

From pretest to posttest, all intervention schools and two out of nine control schools changed their canteen content in accordance with the national guidelines for school-based nutrition. Changes mainly consisted of removal of sugary products and replacement of white bread with wholegrain bread. One intervention school involved their pupils in this change. The intervention had no effect on adolescents' self-reported school or overall dietary behaviour, yet a higher frequency in the intervention group met recommendations for intake of whole-grain bread and fish in their overall diet. The most

significant contributor to adolescents' school-diet were restrictions about leaving school area during school hours.

Making secondary school canteens' content healthier provided no short-term effects on adolescents' self-reported diet. To achieve dietary effects on individual level, stronger involvement of pupils in the process and longer follow-up assessments of the changes are suggested.

Free school breakfast experiences in Agder County

Knudsen ECM¹, Bjørkkjær T¹, Johannessen B¹

¹ University of Agder, Norway

*Corresponding author: elsechr.knudsen@getmail.no

In 2019 the initiative of a free breakfast in all upper secondary schools was initiated in Agder county. The intention of this study was to gain information about the experiences employees and pupils had from the free school breakfast initiative. The data collection was conducted through short individual interviews (8-10 minutes) with pupils and employees at their schools.

The project intended to interview one employee and five pupils per school. The interviews were recorded and transcribed verbatim. 23 semi-structured interviews were conducted in the spring and fall of 2021 at four upper secondary schools in Agder. The total number of informants were 23, 19 students and four employees. The method used for the analysis is based on a qualitative method; Systematic Text Condensation by Kirsti Malterud.

Five themes with zero to four subthemes emerged from the analysis. The results indicated that the following were important; time aspect, the social aspect, a free meal, the variety of food, and communication according to the informants.

The participants talked about time as an important factor to be able to eat the breakfast with school schedule and transportation issues mentioned. Several talked about the school breakfast being a social event. Many of the participants said it was positive with a free breakfast. Several talked about the necessity of variety of food. One factor for not eating was for some of the pupils that they were not aware about their school serving free breakfast, highlighting communication issues.

The Swedish School Meal Heritage - Memories of Food, Taste and Togetherness (or not)

Prell H^{1*}, Sporre CM¹

¹ Department of Food and Nutrition and Sports Science, University of Gothenburg

*Corresponding author: hillevi.prell@ped.gu.se

In Sweden, school lunch has been served for more than a hundred years, but it was not until 1997 that it became a democratic right to all school children. Today, about 1.3 million hot school meals are served daily. Over the years, the school meal quality has been associated with different opinions and subject to much debate.

In the present study, we explored school meal food and taste memories in a web based survey with open questions, distributed in social media in the summer of 2020. The 246 respondents attended school between the 40s and the beginning of the 2000s and shared freely their views and experiences of the food and different tastes, but also of the atmosphere and feelings. A thematic qualitative analysis was carried out using NVivo 12 Pro, resulting in two overarching themes.

The traditional school food heritage theme consisted of accounts of traditional Swedish food through the ages and meanings attached to it. Positive, as well as negative memories were connected to likes and dislikes of certain foods and dishes. The social school food heritage theme tells us about coercion, control and peer pressure, but also about joy, friendship and togetherness. For some pupils, it was the only proper meal that they ate during the day.

The Swedish school meal is a shared experience surrounded by strong feelings and memories regarding the food and the context. The school meal means a lot both culturally and socially and acts as a carrier of a common food heritage.

"Little Boarders" between the two World Wars. Examination of the foodways of working-class children in Northern Hungary after the WW2

Nickel VR¹

¹ Research Centre for the Humanities Institute of Ethnology, nickel.reka@abtk.hu

The present study attempts to capture the oldest memories related to the foodways of children attending school in the Ózd and Salgótarján steelworks colonies and aims to serve as a basis for a future, long-term study of the history of child nutrition in the (former) industrial colonies of northern Hungary. What has the canteen taught us and what are we teaching our children through our current eating habits? How has public catering shaped Hungarian society in the last 70 years? The public catering and general work obligation, which started in the Rákosi era and culminated in the Kádár era, significantly changed the eating habits of families. Since the youngest members of today's Hungarian society spend most of their (waking) lives and childhood not with their families, but in public education, the role of the school is enormous not only in the transfer of lexical knowledge but also in training, including the basic rules of healthy eating as well as restaurant dining.

I made historical research in the Archives of Nógrád, Heves and Borsod County and also made so many interviews like a member of the interdisciplinary research group focused on school canteens in Hungary. The project supported by National Research, Development and Innovation Fund of Hungary.

Although the Soviet-style general public catering was already available to everyone in Ózd and Salgótarján in the 1950s, in the first two decades it was not used by children from households where the older female family members were homemakers, so 1949 was not considered a starting point of the new epoch. Prior to World War II, as in the first half of the 1950s, the foodways of the children of the workers and clerks of the steelworks in Salgótarján and Ózd were determined solely by family customs. The public catering and general work obligation, which started in the Rákosi era and culminated in the Kádár era, significantly changed the eating habits of families. The traditional elements characteristic

of a locality have disappeared as the globalization efforts of socialism were accomplished. The number of meals, the timing of the meals, and of course the menu items have all changed. An examination of the menu shows that Palóc and Slovak customs clearly dominated in the Salgótarján and Ózd colonies as well before the 1960s.

Eating habits, everyday and holiday foods have defined individual and community identity in the former peasant and bourgeois cultures, and they have a significant influence in shaping society even today, notwithstanding the introduction of Soviet-style public catering after the Second World War that radically transformed not only the menu items but also our eating habits.

A study on how students in secondary school experience the lunchbreak - with focus on the social meal

Fauskanger TS¹, Aadland EK¹, Fossgard E¹, Bjørndal B^{1*}

¹ Department of Sport, Food and Natural Sciences, Western Norway University of Applied Sciences, Bergen, Norway

*Corresponding author: Bodil.Bjorndal@hvl.no

Background: The Norwegian Education Act states that all pupils have the right to a safe and good school environment that promotes health, well-being, and learning. However, the potential of the school meal as a social arena has not been a focus area in Norwegian schools. The aim of this study was: How does different spatial and practical organisation of the meal influence pupils' perception of the school lunch?

Methods: A comparative case study of two different secondary schools in Norway was performed, one in Trøndelag county spring 2020 (school A) and one in Vestland county fall 2021 (school B). The study used a mixed method approach combining observation, focus group interviews and questionnaire. The participants were from the 8th (age 13-14) and 10th grade (age 15-16) and the questionnaire was answered by 243 students at School A and 131 students at School B.

Results: The students at school A ate in a cafeteria with optional seating, where they could also buy food and had 20-40 minutes available for their lunch. The students at school B were restricted to their classroom during the meal and had 10-20 minutes available for their lunch. Students at both schools brought lunch packs from home. Students from school A who ate in the cafeteria were more satisfied with the organization of their lunch than the students at school B who ate in the classroom. The students at both schools agreed that the lunch was their break from teaching, and it was important for them to choose who to eat with. In addition, students at school B were unhappy with the lack of a cafeteria to buy food. The majority at both school A and B answered that they prefer to talk to their friends during lunchtime. 23% of the students at school B answered that they sat alone during meals, while at school A less than 2 % answered that they sat alone, and this was confirmed by observations. The students at both schools agreed that 20 minutes was enough time to eat, and the students at school B were pleased that the eating schedule increased from 10 to 20 minutes during the study period. Observations showed that the students at school B spent a lot of time on their mobile phones during lunchtime, while school A was a mobile-free school. The students at school B were positive about the use of mobile phones and believed that it did not affect the social aspects of the meal. The

students at school A did not often mention mobile phones as a topic, but a few participants in the focus groups said that they liked that mobile phones were not allowed at the school.

Conclusion: Based on the data material, the possibility to sit with friends in other classrooms during lunch or a cafeteria with optional seating could contribute to increased well-being among the students, as it may facilitate a more social meal. A mobile phone-free lunch could also contribute to a more social meal, although this is doubted by students used to having access to their mobile phones.

Students breakfast habits and socioeconomic status: A comparison of two high schools with a free breakfast meal

Cornelia Blytt^{1*}, Mia Folkestad^{1*}, Despoina Theofylaktopoulou¹, Iselin Thowsen Vildmyren¹, Cathrine S. Kolve², Elling Bere², Arnfinn Helleve², Bodil Bjørndal¹

¹ Department of Sport, Food and Natural Sciences, Western Norway University of Applied Sciences, Bergen, Norway

² Norwegian Institute of Public Health, Oslo, Norway

*Equal contribution

Background: Inequality in health related to socioeconomic status (SES) can be seen in the population at an early stage in life. This makes it important to facilitate good and healthy eating habits early, and the school is an important arena. Vestland county offers a free school breakfast at all senior high schools, but the organisation and content of the meal differs between schools. The purpose of this study was to examine breakfast habits among students in two schools with a free school breakfast and determine whether the program reaches students with a low SES.

Method: Data from the School meal survey 2021, developed and distributed by the Norwegian Institute of Public Health, was analysed, and two senior high schools in Vestland county with different organisation of a free school breakfast was selected. We used a score for cultural capital and Family Affluence Scale (FAS) to measure the students' SES.

Results: At school A, 217 students (27.7 %) and at school B, 297 students (31.7 %) answered the survey. The organization of the school breakfast differed in that school A served the meal during the first free period, while school B served the meal before the school day started. The number of students with a low cultural capital was higher among participants at school A (32 %) than school B (9 %), while FAS did not differ between schools. The students' general breakfast habits were similar at the two schools, and approximately half of the students in both schools had breakfast five days a week. A higher percentage of the students with high cultural capital-score had breakfast five days a week than those with medium and low scores. However, more of the students at school A ate breakfast at school compared to school B ($p < 0,001$). 54 % of students at school A ate breakfast at school three or more days a week, while only 13 % in school B did the same. In addition, 24 % at school A seldom or never ate breakfast at school versus 74% in school B. 51 % of the students who ate breakfast three or more days at school B had a low cultural score, 59 % had a medium cultural score, and 36 % had a high cultural score.

Conclusion: This study shows that self-reported breakfast habits were connected to cultural capital but not FAS. School A had a significantly higher participation in the school breakfast program compared to school B, and the breakfast in school A was used by students with different SES, when measured by cultural capital. The study suggests that the school breakfast program has the potential to affect the food habits of students with low SES and may increase their breakfast frequency, but this depends on the organization of the school meal.

Keynote speakers

Linda Berggren, Phd. Associate professor at Department of Food, Nutrition and Culinary Science, Umeå University, Sweden.

“It’s not really about the food, it’s about everything else”: Pupil, teacher and head teacher experiences of school lunch in Sweden

School lunch is a well-established cultural phenomenon in Sweden, a country that holds a long tradition of providing, by law, nutritious, tax-funded, served school lunches. The overall responsibility for school lunch lays with the municipality, the school and the head teacher. This thesis highlights the school lunch situation from the perspectives of pupils, teachers and head teachers in Sweden. The overall aim is to contribute with a deeper understanding of how these school actors perceive and experience the school lunch. The thesis is based on a qualitative descriptive research design using focus group discussions, empathy-based stories, individual interviews and a qualitative analysis of open comments from a questionnaire. The main theoretical base is based on Henri Lefebvre’s theoretical framework of social production of space. The results show that the perceptions and experiences of school lunch are negatively affected by the way the school lunch is framed and organized at both school and municipality level, and that favorable conditions for the school lunch situation do not always exist. This in turn has an impact on, for example, the valuable school lunch interactions. The unfavorable conditions for school lunch also has an impact on the possibility of influencing practices and adherence to policies. Results from the thesis indicate that the physical and organizational dimensions of school lunch need to be acknowledged.

Patricia Eustachio Colombo, PhD. Researcher, Department of Global Public Health, Karolinska Institutet, Stockholm, and Career Development Fellow at the MRC Epidemiology Unit, University of Cambridge.

Fostering sustainable dietary habits through optimized school meals - the OPTIMAT project

Committing to the fulfilment of the Paris Agreement and the Sustainable Development Goals 2, 3, 12 and 13 requires fundamental changes in food production and consumption. Due to their reach and scale school meals have considerable potential to shape children’s diets and reduce food-related GHGE—in both the short and long term.

The OPTIMAT project commenced in 2016 and aimed to contribute to healthy and sustainable dietary habits in Sweden through school meals optimized to have reduced climate impact while being nutritionally adequate, affordable and acceptable. OPTIMAT consisted of four sub-studies: The first assessed the contribution that school meals make to children's total dietary intake among a representative sample of 2,002 Swedish school children. Results indicate that school meals are somewhat more nutritious than meals consumed outside of school and that they can play a beneficial role in compensating for lower quality meals in families with a low socioeconomic status. The second sub-study was a methodological paper describing the development of a strategy to reduce GHGE in the Swedish school food supply by linear programming, without compromising its nutritional adequacy, affordability, and cultural acceptability. The third sub-study was a real-life intervention testing a four-week lunch menu plan with a 40% reduced climate impact based on this optimization strategy. The evaluation showed no significant increase on food waste, and no change in consumption or pupils' school meal satisfaction. The fourth sub-study was qualitative and concerned barriers and facilitators of implementation of the new climate-friendlier school meals as experienced by pupils and meal staff.

The OPTIMAT project has the potential to contribute to more nutritious and sustainable dietary habits through public procurement and thus to more efficient use of public resources, and to fulfilment of the Agenda for Sustainable Development and the Paris Agreement.

2A Parallel session: Cultural and organizational aspects on school meals

Jason O'Rourke

Food Education in schools: why do some headteachers make this a priority?

O'Rourke J¹

¹ Washingborough Academy, England, jasonorourke@yahoo.com

My recent doctoral research focused on the reasons why some primary school headteachers in England include Food Education so prominently in their school's pedagogical curriculum. My study investigates if there are other reasons why a set of recognised leaders in Food Education include this learning focus in their school's curriculum.

This qualitative research study is based on semi-structured interviews with ten primary school headteachers in England. The responses were submitted to Reflective Thematic Analysis. The theoretical framework takes a social constructionist approach, focusing on the interpretation of the school leaders' views, and experiences of including Food Education into their school's curriculum.

My findings reveal that the headteachers do not use Food Education solely to support the healthy eating agenda. By shaping the school ethos and culture through the communication of their personal and professional values and vision, they are able to extend the wider benefits of Food Education to positively influence other aspects of the school and wider community. Their use of the 'pedagogical curriculum' as a stimulus has enabled them to enact what I call 'pedagogical commensality' which supports school

connectedness and has the potential to have wide ranging benefits to both the children's academic and health outcomes and the wider community.

This thesis claims new knowledge in relation to how Food Education can be used as an embodiment of the headteacher's values-based leadership approach; and how 'pedagogical commensality' can be used as a tool to support the personal and social development of the children and the school community.

Kristiina Janhonen

Promoting food sense through school meals

Janhonen K¹

¹ University of Helsinki, Finland, kristiina.janhonen@helsinki.fi

The project FOOD SENSE aims to support students' food related learning in schools with a focus on sustainability, and investigates opportunities and barriers for change in alliance with school meal services and subject based teaching. The project is funded by the Academy of Finland (ref. no. 322598). Execution takes place at the University of Helsinki, Faculty of Educational Sciences, and it is coordinated by postdoctoral researcher Kristiina Janhonen. The study's pilot school is situated in the Uusimaa region, Finland.

The study leans on the novel concept of food sense (Janhonen et al., 2015; 2016a; Janhonen et al., 2018), and Dewey's pragmatist learning theory (e.g., 1916; 1938; 1958). The project implements practice-based, experiential and active learning in a process of co-development. The research design leans on a participatory action research approach (e.g., Kemmis et al., 2007; Kindon et al., 2007; Koshy, 2005). The empirical execution includes qualitative interviews, material of multiprofessional meetings, students' digital learning diary data, as well as feedback questionnaire data from students and the school's personnel.

The presentation provides an overview of the FOODSENSE-project, and presents preliminary results particularly from the first action research cycle of the study (2020-2021). The collaborative school subject at this stage was home economics, and the execution leant on qualitative data.

Opportunities and barriers for school meal pedagogy needs more systematic evaluation, including examinations of the opportunities to support students' school meal related learning across spaces in schools (e.g., the dining room and classrooms).

Báti Anikó

The role of the school food (Hungarian example)

Anikó B¹

¹ Institute of Ethnology, Research Centre for the Humanities, Budapest, Hungary,
bati.aniko@gmail.com

The presentation examines the school food through the example of selected settlements (in addition to the capital, 3 smaller towns, two villages.) based on the work of the author's research group comprised of ethnographers and dietitians. Canteens operators differing by settlements, be it the state, the church, or the local government. Because of all of this, they may operate in a different way in the capital, or in a village. This ongoing study focuses on the operation and social embeddedness of school canteens and, the at-home eating habits of the families involved. Through questionnaires, interviews, fieldwork observations we collect information on cooking, serving, and meal courses, habits, preferences, and nutritional knowledge of students, teachers, kitchen staff, and parents. Many people are dissatisfied with school canteens, leftovers generate a great deal of waste, and many quit school lunch programs. Some examples based on our research highlight the special role of the centrally regulated school food in the local food culture; difficulties with social, historical roots which on occasion hamper school lunch to become socially accepted model of a healthy diet. The project supported by National Research, Development and Innovation Fund of Hungary.

Melissa Vargas

School food nutrition guidelines and standards for safeguarding children and adolescents' right to food

Vargas M¹

¹ Food and Nutrition Division, Technical Advisor Nutrition Guidelines and Standards, Food and Agriculture Organization of the United Nations, Rome, Italy

Background: The development and application of nutrition guidelines and standards (NGS)* for national school meal programmes, has the potential to not only improve the quality and adequacy of meals provided to children and adolescents, but also be used as an instrument to support the right to adequate food in these vulnerable population groups. Furthermore, creating meaningful synergies with food and nutrition education has been recommended globally to support children, adolescents and their families' food and nutrition capacity development and resilience-building.

Despite their relevance, many countries currently have no official nutrition standards (or have some criteria that needs revision) to guide the composition of the food and meals that are provided on a daily basis to students. NGS go beyond setting nutrient-based targets and require an evidence-based and context-specific process to be effective. However, this process is resource-intensive, require technical capacities and involve the coordination of different sectors, thus is not often carried out or when NGS exist, they are not evaluated or linked with other critical aspects of the school food system. Currently, there is no clarity upon the best processes to follow to develop NGS.

Methods: FAO and WFP are currently implementing a three-year project to address these gaps, by creating a global methodology for countries to develop cost-effective, feasible, participatory, context-specific, flexible and (food) systems-based school meal NGS, and to promote tools and complementary measures (i.e. food education and food environment strategies) that can enhance their impact, as well as their integration into national legal frameworks anchored in the Right to Food.

This process involves collection and analysis of food consumption data, analysis of nutrition issues, school policy analysis, understanding of the value chain and procurement possibilities, acknowledgment of regional/local consumption patterns, assessment of school-level infrastructure and equipment, consideration of food safety risks and evaluation of programme's aims and resources, including human capacities. Environmental sustainability considerations are also starting to be more commonly addressed in the development process of NGS, as well as the active involvement of children and adolescents.

The methodology will be used in Cambodia and Ghana, and the resulting NGS will be pilot-tested at subnational level and compared with usual school meals to identify dietary effects. The whole process will also document lessons learned and will be used to improve the methodology. Global and country level capacity development, guidance communication and advocacy strategies will also be conducted to further support and complement the methodology.

Expected results: The project is currently in its initial phase. The expected results include:

1. Nutrition guidelines and standards and complementary measures (food education, food policy) are developed, strengthened and applied, using a food systems approach, by Ghana and Cambodia.
2. Capacities to effectively design, implement, evaluate and revise NGS and complementary measures are enhanced in Ghana and Cambodia.
3. A validated methodology and complementary tools for designing NGS are available for use by target institutions in priority countries.
4. The global dialogue around the need, priority and potential of systems-based NGS is strengthened.
5. Guidance to incorporate NGS as a legal requirement to fulfil children's and adolescents' right to food is available for priority countries.

* NGS: Defined here as a set of rules, principles and recommendations, based on sound nutrition science and the national/local situation, designed to improve the nutritional quality and quantity and/or adequacy of foods and meals available/provided in schools.

2B Parallel session: Sustainability of school meals

Sara Frödén

Rethinking School Meal as a part of Environmental and Sustainability Education

Frödén S¹

¹ School of Humanities, Education and Social Sciences, Örebro University, Sweden, sara.froden@oru.se

Food is an important sustainability issue. It is a politically and emotionally charged subject, raising complex questions that entail varying interrelated themes - ranging from health and identity to environmental problems and globalization. Free school lunches for all pupils in Swedish primary and secondary schools provide unique opportunities to promote healthier and more sustainable food and eating habits. Drawing on John Dewey's educational philosophy and a didactic model of sustainability commitment, the aim of the study is to explore the challenges and possibilities of integrating the school meal in environmental and sustainability education (ESE).

The study is based on semi-structured interviews with pupils, teachers, and school kitchen staff in four schools in Sweden.

The results show that the school meal, as a common everyday experience, can provide concrete food-related examples addressing both the social, environmental, and economic dimension of sustainable development and highlight various content areas such as (un)sustainable food production and consumption, global and local food cultures, and food waste. However, to support the pupils' sustainability commitment, the teacher must offer a variety of learning experiences. For instance, engaging the pupils in meaningful hands-on exercises and experiments as well as offering theoretical and problem-solving discussions.

It is concluded that rethinking school meal as a pedagogical tool for ESE instead of viewing it as merely a lunch break is possible, but it requires that the teacher has sufficient knowledge about food as a sustainability issue.

Tina Bowley

SUSTAINABLE SCHOOL LUNCH A mixed methods study of the economic, environmental and social perspectives of the mid-west region in southern Sweden

Bowley T¹

¹ Serviceförvaltningen - Skolrestauranger, Malmö Stad, Malmö, Sverige

Background: Worldwide school meals have been identified as a fundamental setting for addressing public health challenges, and sustainable food consumption is no exception. Yet, little is known about the implications of shifting to sustainable eating patterns in large-scale public settings such as primary schools.

Aim: The aim of this study was to gain a holistic understanding of the economic, environmental, and social perspectives influencing the feasibility of implementing sustainable school lunches in a Swedish school meal setting.

Methods: A mixed methods approach included three empirical datasets. These comprised three informal interviews on the economic perspectives of school meal provision; a sample of consumed school foods from the 2015/2016 school year was used to estimate the environmental impact and; a survey was conducted on nine pupils' sustainable school lunch preferences. Each dataset was integrated with a structured literature search and three frameworks of respectively Good Governance, One Planet Plate and Reciprocal Determinism.

Results: The interviews showed that unsustainable school meal consumption is not holistically addressed. Policies lack enforceability and are weak in systematically monitoring compliance.

The food list sample showed that animal-source foods emit nine times as much greenhouse gas emissions, are 44% higher in weight and cost almost the triple of plant-based foods. The survey showed that pupils are willing to try novel foods but not all meals can be substituted for sustainable options.

Conclusion: Sustainable school lunches are feasible only when there is a coherence between the economic, environmental, and social perspectives. It is advised that further action is taken if school meal provision in this region is to reach the sustainable development goals.

Ulrike Liisberg

«Food jungle» - an initiative to promote sustainable food habits for children at after-school facilities in Norway

Liisberg U^{1,2,*}, Bjørkkjær T³, Fossgard E²

¹ Oslo Nye Høyskole, Norway

² Høgskolen på Vestlandet, Norway

³ University of Agder, Norway

*Corresponding author: ulrike.liisberg@oslonh.no

After-school facilities possess a great potential as an arena to promote awareness of sustainable food habits in Norwegian children. The Food jungle (Matjungelen), an initiative directed towards after-school facilities in Norway, has the overall purpose to increase children's knowledge about food in accordance with both health and sustainability.

The objective of this study was to investigate how the Food jungle can contribute to an increased focus on and knowledge about sustainable food habits at after-school facilities.

Semi-structured group interviews with both children and employees at four different after-school facilities attending the Food jungle were performed. Food jungle activities were also observed. The interviews were recorded, transcribed and a thematic analysis was performed to identify patterns and obtain relevant information.

The Food jungle was highly welcomed by the employees who see the need for increased knowledge about sustainability for both themselves and the children.

The monthly themes, activities and recipes highlight sustainable food habits both direct (growth of vegetables, local food, recycling and an increased use of fish and vegetables) and indirect (exploring new tastes and - food). Most children showed great enthusiasm during the activities and when talking about the activities and discussions related to sustainability.

The program is likely to increase an overall focus on sustainable food habits at the after-school facilities through activities and themes initiating exploration, interest and discussions related to sustainability.

FRIDAY

Keynote speaker

Dorte Ruge, Ph.D., Associate Professor UCL University College, Odense, Denmark

School foodscapes in Greenland and Denmark - critical perspectives on equity and social justice.

Ruge D^{1*}, Mitdlarak L²

¹ UCL University College, Odense, Denmark

² MIO National Advocacy Center working for Children's Rights in Greenland, Denmark

*Corresponding author: doru@ucl.dk

The objective of this abstract is to present and discuss critical perspectives on school food in Greenland and Denmark. The two countries are closely connected through a shared colonial history, where Denmark dominated Greenland culture, policy and exploited the natural resources for decades. The Danish hegemonic system also had an impact on the social systems and the establishment of a welfare state in Greenland with reference to the Danish social system. Today, however, the Greenland care and welfare for children encompass free school meals - this is opposed to the situation in Denmark, where there is no national school food program. Rather, a well-funded supermarketization seems to dominate food and meals for children in Danish Schools.

The researchers apply a qualitative method, based on critical discourse analysis (CDA) of relevant documents and texts. The documents include policy texts and market-based advertisements. The discursive elements and directions are compared and the implications are discussed.

Results indicate that the Greenland school foodscape is based on a holistic, WHO, integrated approach that seek to reduce inequity and social injustice among children and youth. In comparison, the Danish general school foodscape seems to be dominated by supermarkets and corporations that do not support public, free school meals. There are some indications, that free school meals in Greenland are under pressure from more

market-oriented, Danish, approaches, which will lead to increased inequity and social injustice among Greenland children and youth.

The current school food scapes in Denmark is based on a system where parents are supposed to give their children a 'packed lunch' based on supermarket ingredients, that they can bring to school. However, this system contributes to inequity and social injustice among children and youth in Denmark. Rather, the national school foodscape in Denmark ought to be transformed according to the Greenland School foodscape to the benefit of reduced inequality in health and education among children and youth. A public school meals reform conducted in collaboration between Greenland and Denmark could become a driver for a healthy, green transition and contribute to the local economies and social innovation.

3 Session: Political and structural aspects of school meals

Elsie Brenne

Healthy and sustainable school meals

Brenne E^{1*}, Soberg S²

¹ Department of public health, Viken County, Norway

² Matvalget, Debio Norway

*Corresponding author: Brenne E, elsieb@viken.no

The strategy for health-promoting schools in Viken county states, among other things, that schools should offer healthy and sustainable food to students. In the winter of 2021, the county municipality started a project of 13 schools/canteens that offered free school meals to students. The precondition was that the meals should follow the Norwegian Directorate of Health's guidelines as well as principles for a sustainable meal, at a maximum price of NOK 15 each meals.

In the project, the schools/canteens have received guidance from Matvalget. A guidebook has also been prepared for healthy and sustainable canteens and also a new model (tallerkenmodell) that takes into account sustainable meals.

Ål and Kalnes Upper Secondary Schools have successfully implemented a free school meal for all students every day. Ål offers a completely free canteen, while Kalnes offers either a free breakfast or free lunch to all students every day. The meals on offer are in line with the county council's new model.

It is possible to make healthy and sustainable school meals for less than NOK 15 per meal in foodcosts. Working costs are not included in this. Most schools/canteens are not rigged to serve free food to all students every day, and more equipment and staff are needed to succeed overall. The pupils are well satisfied with the meal offer, there are just a few students asking for traditional canteen or kiosk items that are not in line with a healthy and sustainable meal.

Viken County Council is now conducting an assessment of how the pilot project can be rolled out further.

Cathrine Solheim Kolve

Healthy and sustainable school food in Norway -development of a one-pot concept

Kolve K^{1,2}, Helleve A¹, Bere E^{1,2}

¹ Centre for Evaluation of Public Health Measures, Norwegian Institute of Public Health

² Department of Health and Inequalities, Norwegian Institute of Public Health

Background: Healthy and environmental sustainable diets do match. Last year, the EAT-Lancet commission introduced the first suggestion on a Planetary health diet. For Norwegians this means less than 1/3 of current consumption of meat and dairy, a more than doubling the amounts of vegetables, and quadrupling of legumes and nuts. The intake of grains should all be whole grains. With only one hot meal (dinner) in Norway, the possibilities to eat vegetables and legumes are limited. The tradition of bringing packed lunches from home to school means for most people open ended sandwiches (of medium coarse bread) with margarine/butter, meat and cheese, and less than recommended amounts of fruits, vegetables, legumes and nuts. In another Lancet commission (The Global Syndemic of Obesity, Undernutrition, and Climate Change), the school meal has been suggested to possess a potential of being a triple-duty-action. I.e. at the same time targeting both undernutrition, overnutrition and climate change. Concept: We believe there is a great potential in one-pot-cooking within the Norwegian school system, and developed the concept together with two organizations (Geitmyra and Unge kokker). Soups and porridge are typical one-pot dishes. Soups are made with vegetables and/or legumes with, but not necessarily including, fish or meat. Porridge is grain-based dishes. The grains are often whole grains, such as oatmeal porridge, with fruit and nuts as toppings. Conclusion: School food provision has the potential of improving adolescents' diet with planetary sustainable meals using one-pot cooking.

Bengt Egberg Mikkelsen

Exposure, Effect and Empowerment - a food systems approach to food at school

Mikkelsen BE¹

¹ Professor, PhD, Urban Food Systems Transformation, University of Copenhagen, Denmark, bemi@ign.ku.dk

School Meal Program (SMP's) has for a long time been seen as an important tool to change dietary behavior into healthier ones among young people. It is a much valued intervention strategy that has been studied extensively using end points such as anthropometry and indices of healthy eating. Studies across the world has shown that there is a fair to good evidence that providing food at school can improve eating and thus make a contribution to population public health. However, as the climate crisis has worsened the focus and attention within the domain of school feeding seems to have been changing. With a shift of focus on individual health to a planetary health focus school feeding has got a new wave of attention. In the wake of the UN Food Systems Summit 21, policy attention, advocacy and strategy development has opened up for a new way of understanding school food. Could it be that SMP's are important components of more sustainable food systems? Could it be that instead of looking at SMP's only from a provision point of view - as a matter of exposure to good and healthy food - that food at

school should be looked upon from an educational point of view? That instead of thinking that food leads to health outcomes simply by being eaten - that instead learning about food and food systems could contribute to the much wanted long term change of food systems in a more sustainable fashion. That by moving from a feeding approach - a "canteen" approach - to a "classroom" approach, empowerment of young people can be achieved. The paper is based on the insights of the SESAM - Sense; Science & the Magic of Food - program that was developed, implemented and evaluated on 6 Danish schools, among 300 pupils and with 25 teachers over the years 2020-21. The paper start by suggestion a program theory for food at school and presents a model for a "Canteen2Classroom" approach. It goes on by presenting the SESAM intervention components in which food systems learning themes was developed in the STEM and home economics classes based on the concepts of Problem Based Learning, STEM teaching, Education for Sustainability and the Whole School Approach. It presents some of the insights and lessons learnt from this kind of 2nd generation food education at school and it concludes by suggesting new future directions of school meal research based on a more holistic understanding of the school foodscape based on the "Canteen2Classroom" approach.

Keynote speaker

Elling Tufte Bere, Phd. Senior Researcher, Norwegian Institute of Public Health. Professor of Public Health at the University of Agder, Norway.

The known, the unknown, and the probably unknowable about the effect of school meal arrangements

Bere has studied the effect of the Norwegian free school fruit policy. His research also focuses on childhood growth and obesity, and nutrition and academic performance.