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Hindering and supporting forces of a development of a daily school canteen with local and organic food of educational value – The case of Tolga

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Abstract

The food system is both a contributor to and affected by climate change. It is necessary to transform the food system and change consumer habits to sustain resources for the coming generations. Schools provide the opportunity to teach children at a young age the importance of sustainable and responsible food and nutrition habits in the form of school meals and education. Daily school food can contribute to increased school performance and development. In the course of this, hindering and supporting forces of the development of a daily school canteen are analyzed based on the research question: ‘What are supporting and hindering forces of a development of a daily school canteen supplied with local and organic food of educational value?’. Thereby, the school in Tolga Municipality, Norway, functions as an example and provides the framework for this research. I conducted interviews, photovoice, a survey, and participant observation with various stakeholders, pupils, and parents to answer the research question. This resulted in detecting the hindering forces of budget, logistics, food procurement, local industry, perception, and repeating meals and the supporting forces of wellbeing, local industry, education, food procurement, and influencing sustainability. These forces included aspects of the tender system, openness to change and support, reducing meat content and food waste, teaching healthy eating habits, and allowing for socialize.

Table of Contents

1. Introduction	3
2. Background information.....	5
2.1 Current lunch process and food education at Tolga school	5
2.2 School food regulations and children nutrition	8
2.3 Sustainable diet.....	9
2.4 Public procurement in Norway.....	11
3. Methods	12
3.1 Interviews	13
3.2 Photovoice	14
3.3 Survey.....	15
3.4 Participant observation	15
4. Results	16
4.1 Interviews	16
4.2 Photovoice	22
4.3 Survey.....	23
5. Discussion	28
5.1 Results	28
5.2 Methods and limitations	35
6. Conclusion.....	36
7. Reflection	38
8. List of References.....	40
9. Appendices	i

List of Figures

Figure 1: Rich picture of Tolga School's current lunch process and food education system.	6
Figure 2: Overview of the fieldtrip schedule.....	12
Figure 3: Hindering and supporting forces mentioned in the interviews	16
Figure 4: Available menu of the canteen presented in the municipal center	19
Figure 5: Hindering and supporting forces mentioned in the photovoice	22
Figure 6: Photovoice theme: social	22
Figure 7: Photovoice theme: food	22
Figure 8: Photovoice theme: variety	22
Figure 9: Hindering and supporting forces mentioned in the survey	23
Figure 10: Results of question 5.....	25
Figure 11: Results of question 8.....	26
Figure 12: Overview of the detected hindering and supporting forces	28

List of Tables

Table 1: Overview of the interview participants	13
Table 2: Survey results of questions 1 - 4	24
Table 3: Survey results of questions 6. and 7.	25

List of Abbreviations

EEA	= European Economic Area
EFTA	= European Free Trade Agreement
EU	= European Union
FAO	= Food and Agriculture Organization of the United Nations
FH teacher	= Food and Health teacher
GHGE	= Greenhouse Gas Emission
NOK	= Norwegian Krone
SFO	= Skolefritidsordningen
WHO	= World Health Organization

1. Introduction

The increasing pressure on the food system to provide safe, nutritious, and enough food for the growing population in times of climate change entails many consequences, including biodiversity and crop loss, pollution, and mitigation. Nevertheless, the food system contributes to climate change and is responsible for nearly one-third of Greenhouse Gas Emissions (GHGE). It reinforces the need for a more sustainable food system, including each supply chain step from production to consumption and waste. Thereby, sustainability defines the responsible handling of resources to sustain them for the coming generations (Molin et al., 2021; Oostindjer et al., 2017; Reisch et al., 2013; Volanti et al., 2022).

The agroecological approach can help to remodel the food system in the wanted direction by holistically including social, environmental, and economic aspects while comprising the ecology of the entire food system (Barrios et al., 2020; Bezner Kerr et al., 2021; Bjørkkjaer et al., 2024; Francis et al., 2015; Perez-Neira et al., 2021). This change can be done based on agroecological principles, as mentioned by the FAO (2018), including diversification of systems, sharing of knowledge, recycling, social values, and traditions (Barrios et al., 2020; Bezner Kerr et al., 2021). Further, it can be influenced by people's food choices and consumption patterns (Molin et al., 2021; Reisch et al., 2013; Volanti et al., 2022). Consumer choice concerning food and nutrition can be favorably influenced in choosing food with a lower environmental impact (Bezner Kerr et al., 2021), for instance, reducing the consumption of meat, fish, and dairy products since the production of these products releases the highest GHGE among food categories (Volanti et al., 2022). Consumer choices on food have further the strength to influence health and the environment (Bjørkkjaer et al., 2024). Therefore, it is important to implement healthy eating habits at a young age (Chortatos et al., 2018; Oostindjer et al., 2017). A change in dietary habits and the attitude towards food waste is needed to enhance the change in the food system and sustain a healthy lifestyle since the obesity rate and sugar consumption are increasing, resulting in growing disease occurrences (Frehner et al., 2022; Reisch et al., 2013).

Nutrition and food education at a young age set the structure for a healthy way of living that will follow throughout life and shape more sustainable lifestyles and eating habits. For instance, at the educational level in Norway, the school's subject, Food and Health (Norwegian: Mat og Helse), provides a practical framework for teaching pupils about healthy eating habits, sustainability, and cooking knowledge. Linked to this, a daily canteen offer with nutritious meals tailored to the needs of children can support the school performance and growth of pupils (Benvenuti et al., 2016; Bjørkkjaer et al., 2024; Derqui et al., 2018; Heim et al., 2022;

Oostindjer et al., 2017). Since pupils spend much time at school and eat at least one meal in this environment, a balanced meal can be ensured to converge to the benefits of school food (Holthe et al., 2011; Pagliarino et al., 2021). The Norwegian Directorate of Health (Norwegian: Helsedirektoratet) developed guidelines for school meals to provide nutritious and healthy food for pupils. However, in Norway, pupils bring mainly packed lunchboxes from home, containing bread slices with bread spread, unless the school voluntarily provides the pupils with a warm meal. Further, as part of a milk subscription, pupils can receive milk or juice (Chortatos et al., 2018; Heim et al., 2022; Holthe et al., 2011).

Meals offered in schools provide room for teaching pupils the origin of food, linking it to agroecological principles of education about how and where food is produced and the provision of food to children (Bezner Kerr et al., 2021; FAO, 2018; Perez-Neira et al., 2021). This paper primarily draws upon the agroecological principles of *co-creation and sharing knowledge, human and social values, culture and food traditions, and responsible governance*, as mentioned by the FAO (2018). One of the principles sets the responsibility on the governance to nudge the food system in the needed direction of sustainability and support healthy and environmental conditions for food production and purchasing. This includes, for instance, the adjustment of procurement criteria favoring local, organic, and seasonal food (FAO, 2018; Perez-Neira et al., 2021). Procurement defines the product acquisition, for instance, food or workforces, conducted by public authorities that can influence, to some extent, the sustainability of procured goods. Thereby, factors that can be considered are, for instance, food type and food origin (Grandia & Voncken, 2019; Molin et al., 2021; Rhode, 2019; Swensson & Tartanac, 2020).

Other factors, such as food waste, food distribution, and production, also need to be adjusted in the right direction in order to enhance sustainability of meals (Oostindjer et al., 2017). Therefore, school food provides the frame to introduce more sustainable food options and habits while providing an educational opportunity for pupils (Benvenuti et al., 2016; Oostindjer et al., 2017). To the best of my knowledge, the current research does not include an analysis of the hindering and supporting forces of developing a daily school canteen with organic and local food of educational value. Therefore, to investigate these elements of the development of a daily school canteen, a force-field analysis was conducted that visualizes the aspects that could favorably affect and negatively impact the wanted change (Swanson & Creed, 2014).

Included in this, the opportunities to overcome hindering forces and enhance supporting forces of a daily canteen offer are investigated based on the research question:

‘What are supporting and hindering forces of a development of a daily school canteen supplied with local and organic food of educational value?’.

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To investigate the development of a daily school canteen, the case of the school in Tolga Municipality was selected, which encompasses 1st to 10th grade, including a total of 150 pupils, 23 teachers, and four assistants (Tolga Kommune). Tolga is a Municipality in Innlandet, Norway, with 1586 inhabitants and 678 households (Statistisk sentralbyrå a), and provides room for many farmers and a long food tradition (information taken from the interviews). Therefore, this thesis aims to analyze the hindering and supporting forces of establishing a daily canteen with local and organic food of educational value based on the example of Tolga School.

2. Background information

2.1 Current lunch process and food education at Tolga school

To visualize the current state of the lunch offered at Tolga school, I drew a rich picture (Figure 1). It is an unstructured illustration of a situation that includes everything known about the messiness and is captured on paper. It is never finished since new things can be added to the circumstances. It helps detect connections between the elements drawn on the picture and clarifies the situation. To resolve messiness, themes are established that help to declutter while grouping the content into neutral categories that appear in several areas on the rich picture (Armson, 2017). The themes of the *lunch process*, *education*, *food waste*, *local industry*, and *food procurement* are established in Figure 1. The rich picture is based on the information taken from the interviews conducted with the mayor, headmaster, canteen leader, former Food and Health (FH) teacher, the procurement consultant, and the field notes generated during participant observation, and was established afterward for an overview of the current state.



Figure 1: Rich picture of Tolga School's current lunch process and food education system.

The theme *lunch process* includes the establishment of the offer, the organization of the procedure, and the procedure itself during the lunch break. It is not mandated by law to provide a warm meal for pupils. However, the lunch offer was initiated three years ago, in 2021, to use vegetables from the school garden and as a part of the school meal project subsidized by the Norwegian government. Currently, the lunch offer includes one warm meal a week consumed in the school canteen, for which around 10-15 NOK per person/meal was calculated. In total, around 85 to 95 portions are planned and prepared on the lunch days. The pupils and teachers receive the meal for free, funded by the municipality, whereas external customers can come by spontaneously and purchase meals for a low price. During meal planning, pupils can suggest meals and vote on these suggestions. The meals rotate in order not to offer the same the following time. However, porridge is served every third time in order to reduce costs. When meat is offered, a vegetarian alternative is also served. The lunch is made in cooperation with the elderly home in Tolga Municipality; some meal components are cooked there and then picked up to bring to the school canteen, where the rest is prepared. The pupils from the 1st to 7th grade receive their meal on Tuesday, and those from the 8th to 10th grade on Wednesday. The shared lunch break of 30 minutes provides the opportunity for pupils to sit with other classes and socialize. During lunch, selected pupils help set the table with glasses and water bottles that are accessible for everyone. They also clean the tables after the lunch break. The food is kept in pots at the counter, where pupils stand in line to serve themselves food or receive help from

teachers. Some teachers supervise the lunch break and sit among the pupils. The parents can pre-order milk and juice through the dairy company Tine, which is also given out during lunch. Pupils can also bring their lunch boxes to the canteen. Additionally, other things can be purchased on the days with no hot lunch, e.g., baguettes or porridge.

The theme of *education* is represented in various areas of the rich picture. For instance, pupils have the *Food and Health* class, a mandatory school subject taught in 4th, 6th, and 9th grade. It focuses on building common knowledge about food, cooking, and sustainability. The teachers can freely organize the classes as long as they fulfill the learning goals (Ask et al., 2020; Beinert et al., 2022). Other school subjects, such as math, are incorporated into the *Food and Health* class to reach cross-disciplinary. In this course, the pupils start preparing the *festive dinner* (Norwegian: Festmiddagen), which is unique for Tolga school. Therefore, *Food and Health* starts in the second half of 9th grade and continues into the first half of 10th grade instead of only providing this class in 9th grade. The festive dinner is a special event where pupils learn to prepare a three-course meal from scratch for teachers and parents.

Food waste plays a vital role in the school canteen. The generated food leftovers during the lunch break are given to the *after-school care* (Norwegian: Skolefritidsordningen (SFO)) or will be served the next day. SFO is a mandatory service offered by primary schools for the 1st to 4th grade (Randby et al., 2021). Another measure to reduce food waste is the reduction of the plate size and the option for a second food serving.

Tolga Municipality has a *local food industry* from which local food can be procured, for instance, meat from the butchery in the neighboring town of Røros (Røros Slakteriet). Further, the local industry, for instance, the municipal center, can support the canteen by ordering food for special occasions and eating the food at the canteen. The food is procured from the wholesaler mainly in conventional quality, including Askø, Tine, and Bama. The company *Abacus* is responsible for procuring for the municipality, including the school. Therefore, the school cannot independently order specific types of food or choose the producer since *Abacus* is responsible for the agreements. Specific waivers in the deals allow the municipality to procure food directly from the producer without going through the distribution centralization system. Many local companies cannot deliver goods all year round, based on which the centralization system is used. Nevertheless, the local companies *Rørosmeieriet* (dairy production) and *Røroskjøtt* (meat production) can provide food all year around from which the

local and organic meat is procured. The framework of *food procurement* plays a role in the lunch procedure. The municipality and the company *Abacus* orient themselves to the EU tender system, including the connected regulations and laws when procuring food (information taken from the interviews and participant observation).

2.2 School food regulations and children nutrition

The *Norwegian Directorate of Health* released dietary guidelines focusing on a varied diet with vegetables, fruits, whole grains, and fish. The usage of processed and red meat, salt, and sugar should be reduced. Further, five portions of vegetables and fruits should be eaten daily, and fish should be consumed up to three times a week, according to the *Helsedirektoratet*. Next to the dietary guidelines, the *Directorate of Health* released national guidelines in 2015 specifically concerning school food, forming a framework to ensure a good meal and quality food within the school setting. The guidelines are directed to home-brought lunch boxes and food prepared in the facilities. These guidelines state that meals are fundamental for maintaining pupils' concentration during school days. They also provide a learning opportunity, for instance, about food production and sustainability. The *Directorate of Health* predetermines the minimum of a 20-minute lunch break to ensure enough time for the pupils to consume their food. It is stated that teachers should be present during the lunch break as role models when it comes to their consumption. Water should be available for everyone since it is essential to maintain body functions. Linked to the national regulation, the *Directorate of Health* states the importance of low-fat milk in providing pupils with minerals and vitamins, such as calcium and vitamin B2. Eating fruits instead of juices that contain higher levels of sugar is suggested, which can affect teeth health. Drinks with added sugar or caffeine should not be offered at school. Regulations for home-brought food include coarse bread, oat porridge, vegetables and fruits, fish, cheese, and legumes. The focus is on a lower salt, sugar, fat, processed, and red meat content and higher fiber and whole grain usage. If food is being served daily at school, fish should be used up to two times a week, vegetarian meals at least once a week, and lean or white meat the other days. Linked to this, when meat or fish is served, a vegetarian alternative should be offered. When serving meat, the focus should be on lean meat, for instance, chicken or turkey, with a low salt content. Usage of red meat or processed meat should be reduced to a maximum of twice a week. Regarding vegetarian dishes, the focus should be on protein and iron-rich diversity, such as legumes, grains, eggs, and tofu. Various foods should be offered to provide essential minerals and vitamins. Foods like chocolate, candy, and chips should be minimal. The *Directorate of Health* states that environmentally friendly and sustainable food handling is essential. A focus

on reducing food waste should be set by optimizing planning, storage, and utilization. Food products with low environmental impact should be prioritized, such as a plant-based diet with whole grains, vegetables, and fish and reduced usage of processed and red meat (Helsedirektoratet, 2015).

Matvalget is a Norwegian institution providing counseling services on sustainable meals to public and private institutions, such as schools, kindergartens, hospitals, and canteens. They provide cooking books, including seasonal meal plans with balanced and sustainable meals containing organic and seasonal food suitable for schools that align with the school food regulations mentioned above. These cooking books include Norwegian recipes and recipes from other countries to enhance food knowledge and support food education (Matvalget). Daily school meals can ensure at least one nutritious and healthy meal to counteract undernutrition and help with concentration and school performance (Eustachio Colombo et al., 2020). School meals should be compiled according to the needs of children while providing an educational opportunity to teach about regional food traditions and include less favored food (Benvenuti et al., 2016). Other factors, such as table manners and nutrition, social factors, such as the interaction with teachers and other pupils, and cultural factors are included. Therefore, the environment in which the pupils receive their meals can impact the lunch meal experience (Torres & Benn, 2017).

2.3 Sustainable diet

The global population is growing, resulting in a higher demand for food. This puts more pressure on the food system to comply with this. Hence, a change to more sustainable food habits is needed to reduce the environmental impact and sustain it for the next generations (Volanti et al., 2022). Dietary choices are linked to consumers' household, social, educational, and cultural backgrounds. Sustainable consumption includes the ethical production and consumption of food, considering animal welfare and working conditions (Reisch et al., 2013). As the Food and Agriculture Organisation of the United Nations (FAO) and the World Health Organisation (WHO) define, a sustainable diet includes contributing to a healthy lifestyle and food security while protecting ecosystems and keeping the environmental effects low. A sustainable healthy diet should contribute to an individual's well-being while preventing diet-related diseases and should be accessible and affordable for everyone. Linked to this, the cultural and social level of the diet should be adequate for the individual (FAO and WHO, 2019). A sustainable diet includes consuming certified fish, less meat, and seasonal products and reducing food waste (Smith et al., 2016). Thereby, the term 'diet' describes the consumption

of food by an individual during a given time (Meybeck & Gitz, 2017). Due to dietary changes, including higher animal and processed products, salt, and sugar consumption, diseases are increasing. The dietary shift impacts the environment through pollution, climate change, and biodiversity loss and does not align with the sustainable diet mentioned above. Therefore, a switch to more sustainable and healthier habits needs to be made (El Bilali et al., 2018; Frehner et al., 2022; Guedes et al., 2023; Reisch et al., 2013). According to Willett et al. (2019), vegetarian diets use less water and land while having a reduced GHGE. Diets that consume fish and poultry instead of ruminant meat also have a lower environmental impact. Further, the consumption of animal-based products, such as dairy and meat, needs to be limited since these food groups and their fodder production contribute the highest to GHGE. As mentioned by Austgulen et al. (2018) and Benvenuti et al. (2016), the reduction of meat consumption is driven by social, cultural, and traditional factors and the perception that a meat reduction results in nutrient deficiency.

Reisch et al. (2013) mention that organic farming has a lower energy demand than conventional farming due to different fertilizer usage. Organic farming works favorably for biodiversity, however, due to lower yields, more land is needed, and products are generally more expensive. Organic products are perceived as healthier due to reduced pesticide and fertilizer usage (Molin et al., 2021). Public procurement can help increase organic consumption and acceptance among consumers of these products (Reisch et al., 2013).

Local food can provide consumers with transparency and the possibility of supporting the local industry. It can further contribute to the local cultural aspect. Thereby, products are labeled local when produced within a 100-mile radius of consumption or with a specific technique or recipe typical for this area (Skallerud & Wien, 2019). Linked to this, local food can help diversify local agriculture and make it more resilient (Molin et al., 2021). Generally, food miles must be reduced, and a focus on local food must be set to reduce transportation distances and the connected GHGE (Reisch et al., 2013). Another factor that could optimize the diet's sustainability is reducing food waste. Globally, one-third of food is wasted, for instance, due to a lack of knowledge and planning. Seasonal and international food products are available year-round due to increasing globalization. Consequently, local farmers are selling their produce to larger companies and giving up their local markets, increasing transportation distances and the environmental impact (Frehner et al., 2022; Reisch et al., 2013). Additionally, seasonal food is perceived as more sustainable since the shelf-life does not need to be increased with chemicals (Molin et al., 2021).

2.4 Public procurement in Norway

Norway is part of the European Economic Area EEA and participates in the European Free Trade Agreement EFTA, which has resulted in the orientation of the EU public procurement laws. Public tender notices are published in the Norwegian public procurement database DOFFIN, and if the threshold is over a certain limit, it has to be published in the EU database. This ensures fair competition opportunities and access to published tenders (International Trade Administration, 2024). Tenders describe a transaction given to a possible seller based on specific criteria, such as economically relevant factors, for instance, price (Rhode, 2019). Included in the Norwegian Public Procurement Legislation (Norwegian: Lov om offentlige anskaffelser) is the consideration of ethical behavior, labor conditions, and environment, as well as ensuring the verifiability of the tenders. The legislation is directed, among others, to state and municipal authorities, including schools and nursing homes, and public agreements with supply activities. These regulations apply when the value is over 100.000 NOK, excluding the value-added tax (Minister of Trade and Industry, 2017; Nærings- og fiskeridepartementet, 2017). Public procurement policies can address the three pillars of sustainability (social, environmental, and economic). For instance, environmental considerations can be linked to purchasing seasonal, organic, and local food and reducing food waste. Social sustainability includes education on healthy foods and consideration of adequate working conditions, and economic sustainability is linked to the assurance of producers' livelihoods (Molin et al., 2021). Different procurement frameworks were established to consider sustainability. For instance, sustainable public procurement involves environmental, social, and economic levels, whereas green public procurement concentrates on the environmental impact. Linked to this, green public procurement considers sustainable production and consumption within the rules and addresses the sustainability issue within food procurement. Criteria included in green public procurement are the purchasing of organic goods and the reduction of environmental impact. With public procurement, consumers can be introduced and nudged toward healthier and more sustainable eating habits. By reducing the meat content while increasing the vegetable content, higher prices for organic products can be balanced (Filippini et al., 2018; Grandia & Voncken, 2019; Molin et al., 2021). Linked to this, Molin et al. (2021) mentioned the procurement of local and organic food paired with food waste reduction to increase sustainability within the consumption.

3. Methods

The school in Tolga Municipality was chosen as a representative example and provided the frame in which the data was collected. The analysis of hindering and supporting forces of the development of a daily school canteen with local and organic food of educational value was based on the force-field analysis by Kurt Lewin, which was mentioned in Swanson and Creed (2014). Within the case study, qualitative and quantitative elements were applied. In the course of this, the methods of interview, photovoice, survey, and participant observation were used. By implementing several data collection methods and involving various participants, the aim was to gain a holistic viewpoint on the research topic. *Appendix I* provides an overview of the process used in the literature research.

The project's approval and ethical consideration were assessed beforehand by the *Norwegian Agency for Shared Services in Education and Research SIKT* and hold the reference number 822040. Participants received an information letter and consent sheet in advance to inform them about the project's purpose, their rights, and data processing and protection.

Two field trips were organized to answer the research question. Figure 2 provides a schedule overview of the fieldtrips.

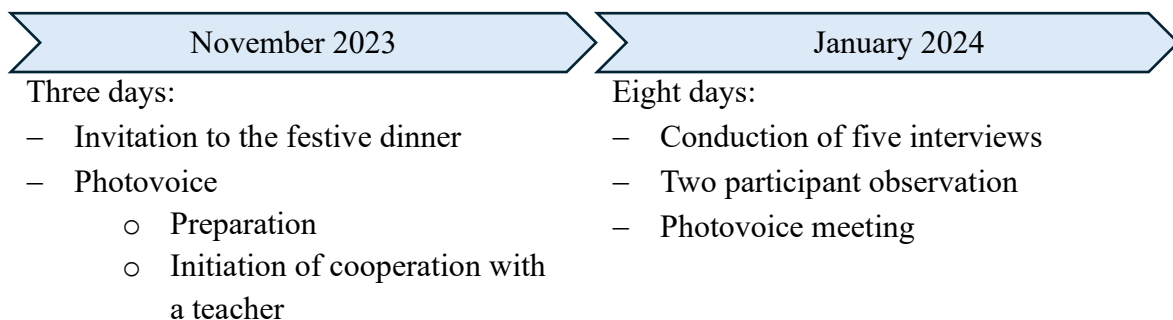


Figure 2: Overview of the fieldtrip schedule

The goal of the analysis of the interviews, photovoice, field notes, and questionnaire was to detect hindering and supporting forces of the development of the daily school canteen. In the course of this, transcripts were established before being coded. The coding process followed the rules mentioned by Corbin and Strauss (1990), which include forming categories and linking these to elements mentioned in the text. Thereby, the focus within the text was on hindering and supporting forces of a daily canteen development. This was followed by analyzing potential relationships between the categories and linking them to existing theory.

3.1 Interviews

In this research, I conducted five interviews in total to gain in-depth information about the current lunch offer, the framework they are operating in, where they see Tolga Municipality in the future, and getting closer to answering the research question. The interview participants were chosen based on their occupations and connection to the school canteen. This helped to gain different viewpoints on the extension of the school canteen and supporting and hindering forces. Table 1 provides an overview of the participants and the interview conditions.

Table 1: Overview of the interview participants

Participants	Conditions
Canteen leader/ FH teacher/ chef at the elderly home	<ul style="list-style-type: none"> – Tolga School – English – 31 minutes
Former FH teacher/ German teacher/ assistant	<ul style="list-style-type: none"> – Tolga School – German – 48 minutes
Headmaster	<ul style="list-style-type: none"> – Tolga school – English – 15 minutes
Mayor	<ul style="list-style-type: none"> – Tolga Municipal Centre – English – 37 minutes
Procurement Consultant	<ul style="list-style-type: none"> – Zoom – English – 24 minutes

A semi-structured interview guide was established and divided into the categories: *general information, school canteen, food procurement, budget, and perception*. Table A1 in *Appendix II* provides an overview of the interview guide. Each participant received question categories based on occupation and connection to the canteen and lunch offer. Beforehand, the interview guide was tested to enhance comprehensibility and adjust the order of the questions. For data protection purposes, the interviewees signed a consent sheet beforehand, agreeing to participate in the interview and using the generated knowledge in this thesis. The names of the participants have been anonymized. The interviews were recorded with the permission of the participants. Therefore, a recorder and the Nettskjema Diktafon App were used. One interview was conducted in German and translated into English afterward. For the accuracy of the translation and to prevent translation mistakes, a German native speaker proofread the

established transcript. The finished transcripts were sent out to the participants for their final consent to use the information gained in the interviews. The data analysis of the interviews included transcribing the interviews and establishing codes and themes of the content. An external reader has checked and proofread the codes to prevent biases.

3.2 Photovoice

Photovoice allowed me to include the pupils and analyze what they like about the current school canteen since the extended offer is mainly direct for them. This represents supporting forces of the development of a daily school canteen and helps answer questions from the interviews. Photovoice is a tool that helps people visualize, for instance, their opinion and perception through taking individual pictures (Wang & Burris, 1997). This method was chosen considering a potential language barrier and a way to collect data regardless. Cooperation with a teacher from the school was established to counteract the potential language barrier and help during the recruitment process. The selection of participants was planned with the teacher, and four 9th graders and three 10th graders were chosen. Participation was voluntary, and the requirements included taking 2 to 4 pictures and a meeting in English to discuss the pictures, the common themes, and potential hindering forces. For data protection purposes, no personal data of the pupils were collected, and the legal guardian signed a consent sheet beforehand, agreeing to participate in the project and allow the usage of the pictures in the thesis. Photos that included faces were anonymized by blurring out the faces to not identify the people in the pictures and to protect data privacy.

The photovoice process was partially oriented by the procedure mentioned in Lieblein et al. (2018), including using the photos as a discussion foundation with the pupils. The conversation with the pupils about the photos allowed diving deeper into their perception and get insights into what they visualized with the pictures (Lieblein et al., 2018). As part of the photovoice method, the selected pupils took pictures with their smartphones based on the guideline: '*This is what makes me look forward to go to the school canteen*'; the students were asked to take pictures during their lunch break. Beforehand, the teacher received a briefing on the guidelines and tasks of the photovoice method to supervise the picture session in the school canteen on a given day. During the meeting, the students explained why they went to the school canteen and what, in their opinion, could be improved in the lunch offer.

3.3 Survey

A survey for the parents was sent out after the second fieldtrip in order to reach a high number of parents. This helped me examine the parents' perception of the current lunch offer and answer questions from the interviews with the stakeholders and those responsible for the offer. Additionally, the parents were involved in getting insights into their preferences of a canteen offer, wanted attributes, and a potential willingness to pay for warm meals throughout the week. This helped clarify the opportunities to develop a daily school canteen.

In the course of this, the platform Nettskjema was used to establish an online questionnaire containing nine questions in both English and Norwegian. Table A2 in *Appendix III*. provides an overview of the established questionnaire. Thereby, qualitative and quantitative elements were included. Before the survey was distributed, the questionnaire was tested for clarification and translation reasons and sent out to a few test subjects to receive feedback.

The school headmaster helped with the distribution and sent the parents a link to the questionnaire via an app. A reminder was sent out 17 days after the first distribution of the link to collect more answers. A second reminder was sent out after an additional 20 days. From the 191 parents in Tolga school, 160 parents received the weblink (information received by the headmaster). During the survey, no personal data was collected, and participation in the survey was anonymous and voluntary. For the analysis of the survey results, the Software IBM SPSS Statistics with the current version 29.0.2.0 (20) was used for a better overview of the descriptive statistics and to establish cross tables. The qualitative elements of the survey were translated from Norwegian to English and followed a coding process.

3.4 Participant observation

Since lunch breaks at Tolga school are divided between different days and school grades, two participant observations took place. One participant observation was conducted during the lunch break of the 1st to 7th graders and lasted 45 minutes. The second observation took place during the 8th to 10th grade break, which lasted 40 minutes. Both observations took place from the teacher's table that provided an overview of the canteen and allowed receiving answers to immediate questions. Participant observation aimed to gain an overview of the lunch process and make connections to the other methods and results by taking part in the lunch break (Kawulich, 2005). No personal data was collected, and the field notes were anonymized. *Appendix IV*. provides examples of the observation field notes. Afterward, the field notes were color-coded to provide a better overview.

4. Results

4.1 Interviews

In the interviews, the headmaster, canteen leader, and former FH teacher helped get insights into the initial establishment of the offer, the current lunch offer, and the framework in which it was established. The mayor and procurement consultant helped to learn more about their opinion of the potential of the local food industry and the EU tender system. Figure 3 provides an overview of the supporting and hindering forces mentioned in the interviews, which are color-coded in green and red, respectively. Table A3 in *Appendix V* provides a more detailed overview of the forces detected in the interviews.

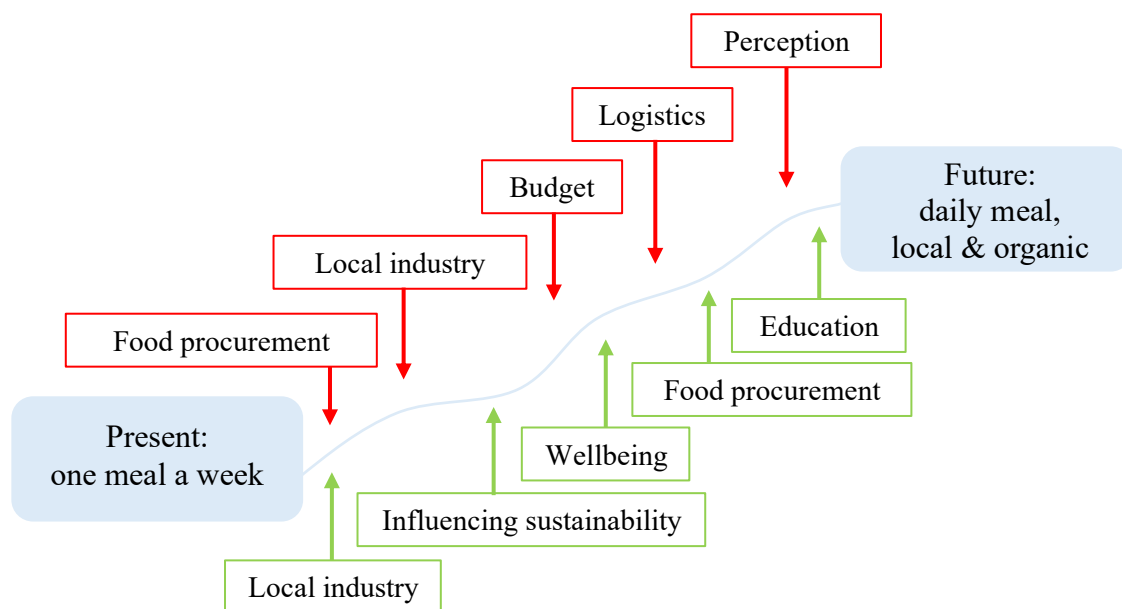


Figure 3: Hindering and supporting forces mentioned in the interviews

The interview results are structured in the supporting and hindering themes mentioned above for a better overview. As a supporting force, the *wellbeing* of pupils and teachers was mentioned. Both the mayor and headmaster stated the importance of the pupils receiving a warm meal and reducing the number of pupils who are hungry at school in order to support their learning and development of competencies.

“It is something we want to do, offering a warm meal because it is absolutely not mandatory [...] it is both to make sure that everyone eats at least a warm meal once a week and for a social function.” (headmaster)

According to the mayor, the warm meal is something many look forward to and is appreciated by the consumers. External customers can drop by any time to purchase small foods, such as baguettes and porridge. Linked to this, the former FH teacher points out the necessity to maintain blood sugar for pupils in order to perform well at school. Another aspect included in the *wellbeing* category is the opportunity for pupils and teachers to socialize. Lunch offers and lunch breaks positively affect socializing between different classes, and teachers and pupils, according to the headmaster, canteen leader, and former FH teacher. The canteen leader mentioned the psychological benefits of the social function of the lunch break.

“It is a possibility to see the pupils, to talk to the teachers and just be in the area. [...] I do not need the meal, but I need the area and the possibility to meet people.”
(headmaster)

Lastly, the interviews mentioned the opportunity for teachers to receive a free meal during lunch days (canteen leader, former FH teacher).

The *education* theme was detected and mentioned in the interview with the former FH teacher and the canteen leader. They stated the importance of teaching pupils what good food is, exposing them to new food, and recommending tasting it. However, as the former FH teacher mentioned, traditional food is not offered at the canteen since it is more suitable for physical work due to the high protein and fat content. Maintaining blood sugar to enhance school performance is more important for the pupils. Further, when establishing the meal plan, the canteen leader focuses on introducing new foods and including the pupils by allowing them to suggest meals and relying on their help to set and clean the tables before and after the lunch break. Further, pupils can sell food, for instance, self-made pizza or sandwiches, in the canteen as part of an educational business model as mentioned by the mayor.

“We get to choose what we want, and I ask the kids what they want. Is something working, something not working? Then we try to adapt, so everyone gets something they like.” (canteen leader)

The local industry can somewhat *influence sustainability*, which was included in the interviews. As mentioned in the interview with the mayor, canteen leader, and headmaster, people who work and live in Tolga Municipality can eat food at the canteen or will be notified via a *Microsoft Teams* group in case of food leftovers to reduce food waste. Additionally, as


mentioned by the canteen leader, food leftovers will be given to SFO or reused on another day in the canteen. However, due to planning difficulties, leftovers from reheated food must be thrown away. Therefore, the focus is on meals that are known to be liked by the majority of pupils. Another aspect that *influences sustainability* in the lunch offer is reducing meat usage in the canteen, as mentioned by the procurement consultant and former FH teacher. Further, the canteen leader favors seasonal and Norwegian ingredients during meal planning.

“I would also say that to deny the use of meat at the canteen or to say that one or two days we don't serve meat that will only work as a provocation. Instead, they should serve food with less meat which is a positive experience for the students to see that this is good instead of that they are not allowed to eat this. You have to do the positive angle to this.” (procurement consultant)

Another supporting force mentioned in the mayor's interview is the *local industry*, which supports the canteen by purchasing food from the people living or working in Tolga Municipality. Additionally, it allows the local industry to grow by purchasing locally, giving room for cooperation within the municipality, and changing the deals to procure more locally. The procurement consultant mentioned a possibility of establishing smaller deals in order to give smaller and local companies a chance.

“[...] The municipalities up here are now changing all their deals so that you can buy more local food. You don't have to always look for the cheapest product. You can look for locally produced, ecologically produced. All kinds of the things we want to do.” (mayor)

External customers can pay a small amount to purchase food. Figure 4 represents a notice in the municipal center to inform about the current food offers. As the mayor stated, the region of Tolga has the potential to provide good food.



MATGALAKSEN EB

MENY	PRISER
Wraps (2 for 60 liten) (Med salsa + 5 kr)	Liten: 35 kr Stor:40 kr
Pizza	25 kr
Yoghurt m/musli	25 kr
Brownie (hjemmelaget)	20 kr
DRIKKE	
Milkshake	15 kr
Kaffe	15 kr
Saft	5 kr

Figure 4: Available menu of the canteen presented in the municipal center

In connection with this, public *food procurement* was mentioned in the interviews with the mayor and the procurement consultant, which also function as a supportive force. As stated by the procurement consultant, there exists room within the procurement rules to purchase more local food. Further, as seen by the mayor, the local initiatives in Tolga Municipality helped establish the canteen beforehand.

Next to supporting forces for the development of a daily school canteen, there were also hindering forces mentioned that worked against it. For instance, the *perception* of the parents mentioned by the canteen leader could work unfavorable since Norway is a ‘lunchbox nation’, and the willingness to pay extra money for food could be prevented by the ‘free school principle’ in Norway. As mentioned by the headmaster, in case of an extended lunch offer, the price has to be equal to the amount used to prepare a lunchbox at home.

“That would be the question about how much because they do pay for the food that the children bring here. It would have to be equal.” (headmaster)

“In Norway, it is the ‘friskole’, free school principle, that kids go to school, and it is nothing to pay. So, maybe, maybe not. Some want warm lunch every day, but some do not.” (canteen leader)

Linked to that, the procurement consultant mentioned a need to change the way of thinking and introduce measures to increase sustainability in food procurement. In the course of this, it was mentioned that introducing less meat into the canteen offer could be a potential obstacle since Tolga Municipality has a strong meat tradition. The former FH teacher also stated a wish for a reduction of meat.

“I think that is one of the problems for Tolga and all this region is to accept the fact that red meat produces a lot of climate gas. They are producing this food, and that is how they live.” (procurement consultant)

One hindering force mentioned in all interviews was the lack of *budget* to purchase local food since Norway has high living standards and wages that increase the price of food produced in Norway (mayor). However, he mentioned that even though local food is more expensive, it returns tax revenue to the municipality and supports the local industry. Additionally, he mentioned budget cutbacks in the municipality, making it more challenging to execute plans. As the headmaster mentioned, money could also be an obstacle in extending the canteen space to provide a meal for the whole school in one day.

“That is always a matter of discussion to me, because yes, the price that you pay per unit is higher. But in each unit that you pay for locally, you also have tax revenue that generates to the municipality. If I buy a steak that has been produced in Tolga, then I know that the farmer who gets paid for that steak, he pays taxes back to the municipality. [...]” (mayor)

The *logistics* of extending the lunch offer were mentioned in connection with this. As stated by the headmaster, hosting the whole school in one day could be impractical due to a lack of space. Additionally, the canteen leader expresses the need for more human resources and kitchen facilities to extend the offer and be able to prepare more food at school. Also, the planning difficulty was mentioned since customers do not have to pre-register for the lunch offer, which can result in increased food leftovers.

The framework of *food procurement* was mentioned as a supporting force. However, it also represents a hindering force since providing a warm meal to pupils is not mandated by law, as stated by the mayor. As mentioned in the supporting force of food procurement, there is room to purchase more local food within the rules. However, as mentioned by the procurement

consultant, the EU tender system can be seen as a hindering force by many people. According to the interview, Norway still needs to implement these rules to procure more local food, and people responsible for the procurement could need more knowledge and competencies to challenge existing rules to procure more food locally.

“There is a lot of people who want to procure more local foods. But there are national rules for procurement. I think a lot of people are afraid to do something wrong. They do not dare to challenge the rules, because there is room within the rules to do that. But they do not know them, or they do not dare to try, because everything you do differently, is hard. It takes time and energy. [...]” (procurement consultant)

A hindering force for the introduction of more local food in the canteen can be the *local industry*. As mentioned in the interview with the mayor, local producers have not organized their distribution system, resulting in the prevention of delivering food year-round and, therefore, not being able to make deals with the municipalities.

“The thing is that some of the local producers had not organized their delivery system. There are some producers that only deliver in certain seasons. They're not able to deliver through the whole year. And that makes it hard to have a year-round arrangement with those producers. I think, they're actually looking into it, to have season deals in the big buy deals with the distribution central so that especially in the season where you get locally produced, you can buy and the rest of the year you get through the distribution centrals. [...]” (mayor)

Linked to this, the procurement consultant stated in the interview that not all local companies want to deliver food to the municipality. Further, smaller companies can only deliver some of the foods on the list and can therefore not make an offer on the big deals.

4.2 Photovoice

The 9th and 10th-grade pupils participated in a photovoice and took pictures based on the guideline: ‘*This is what makes me look forward to going to the school canteen*’. These results represent the supporting forces in developing a daily school canteen that can be enhanced to raise the acceptance of a new offer. After the photo session, a discussion round occurred in which the pupils described the reasons for visiting the canteen in connection to the photos they took. Additionally, what makes them not looking forward to going to the school canteen was included, which represents the hindering forces. Figure 5 represents the hindering and supporting forces mentioned in the photovoice discussion.

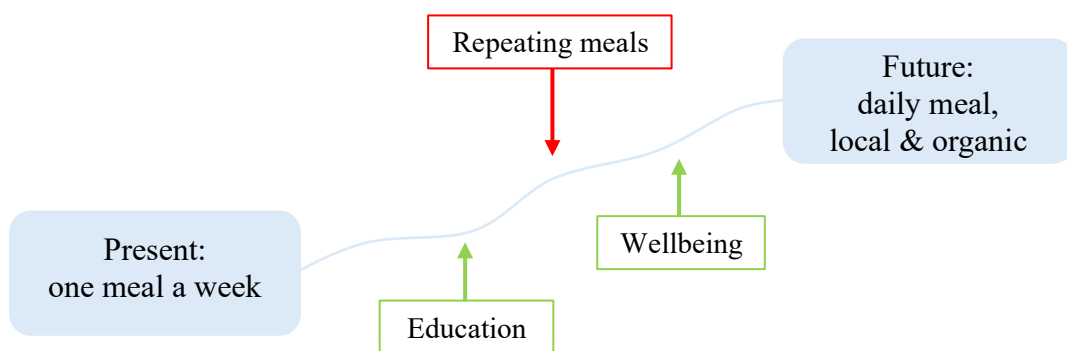


Figure 5: Hindering and supporting forces mentioned in the photovoice

The themes of *social*, *food*, and *variety* were defined to group the photos and are present in the supporting forces of *education* and *wellbeing*. Figures 6, 7, and 8 are representatives of the themes of the supporting forces. An overview of the pictures taken in the photovoice is represented in Table A4 in *Appendix VI.*, and statements concerning the likes and dislikes of the canteen by the pupils in Table A5.



Figure 7: Photovoice theme: social Figure 8: Photovoice theme: food Figure 6: Photovoice theme: variety

As mentioned in the discussion from each pupil and represented in the pictures, *socializing* (Figure 6) and sitting with classmates and pupils from other classes is a driving force for the pupils to go to the school canteen. This aspect is represented in the supporting force of *wellbeing*. In the course of this, pupils can further connect with other classes and sit together. Another detected theme was *food* (Figure 7), which incorporates the supporting forces of *wellbeing* and *education*. The pupils stated that they liked the variety of offered food and that they were included in establishing meals by having the possibility to suggest meals and vote on these suggestions. Further, they mentioned what makes them go to the canteen is the fact that there is free food and that it makes them feel stuffed. The lunch offers' *variety* (Figure 8) was mentioned as a supporting force since different meals are served after another. The pupils mentioned receiving new food and a variation of the offered meals. This aspect is included in the supporting force *education* since pupils are introduced to other ingredients. However, a hindering force mentioned by the pupils and included in the theme of *repeating meals* is that much porridge in the same version was served.

4.3 Survey

The survey was accessible for 45 days in total. After 17 days, the first reminder was sent out to generate more participants, and the second reminder was sent out after another 20 days. In total, 62 parents took part in the survey and answered the questionnaire completely. Figure 9 presents the hindering and supporting forces detected in the survey results.

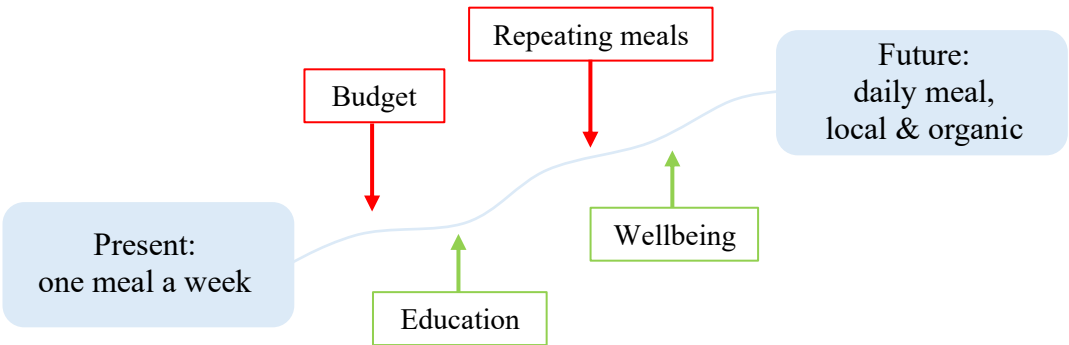


Figure 9: Hindering and supporting forces mentioned in the survey

Table 2 provides an overview of the distribution of children using the lunch offer and their existing allergies. Five out of 62 participants clarified an allergy or dietary restriction.

Table 2: Survey results of questions 1-4

Question	Answers	
1. In what grade is your child?	School grade	
	1	9
	2	7
	3	4
	4	5
	5	8
	6	5
	7	7
	8	9
	9	13
	10	6
2. Is your child currently using the lunch offer?	Yes	62
	No	0
3. If no, is there a reason for it?	-	
4. Does your child have any dietary restrictions?	No	57
	Soap	1
	Nuts	2
	Vegetarian	2

Further, the parents were asked in question 5. what attributes they think a lunch offer should include. Multiple answers were possible. The main attributes that the parents wanted are healthy, variety, fresh, and seasonal. The attributes organic, sustainable, and low price were mentioned the least (Figure 10).

Question 5. In your opinion, what attributes are important for a school lunch?

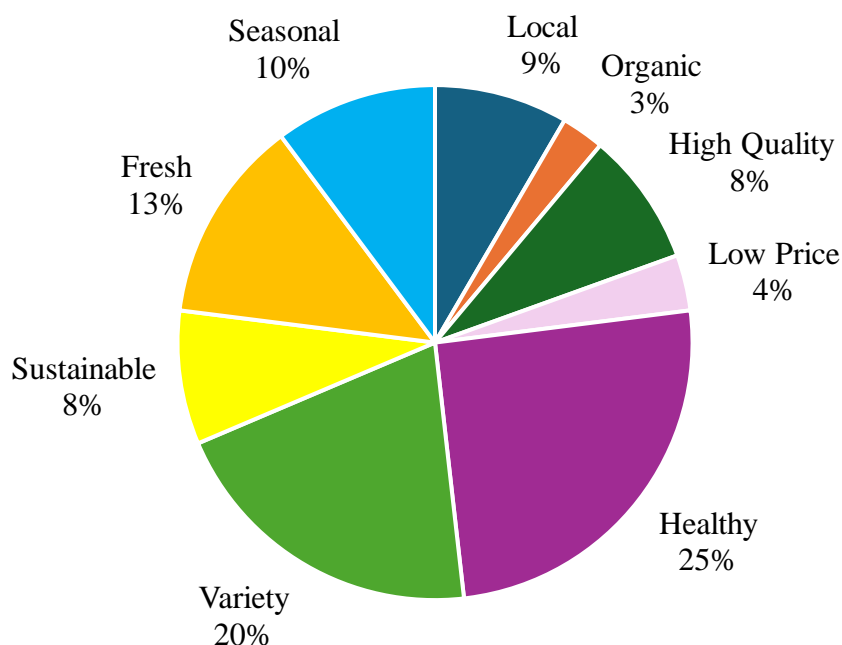


Figure 10: Results of question 5.

Questions 6. and 7. included the framework of a potential lunch extension, e.g., how often would the child be using the lunch offer a week and the parents' willingness to pay for a warm meal throughout the week (Table 3).

Table 3: Survey results of questions 6. and 7.

Question	Answer				
	1	2	3	4	5
6. If available, how often would your child use the lunch offer a week?					
	3	9	9	3	38
7. Would you be open to pay extra for warm school meals throughout the week?	Yes			48	
	No			14	

Most of the parents preferred a lunch offer available five days a week (38/62 answers) and an additional 48 parents were willing to pay extra for a warm meal. In question 8. the parents were asked to classify price which is justified for one school meal. For each meal, the appropriate price was mainly classified between 'under 20 NOK' to '40 NOK' (Figure 11).

Question 8. If yes, how much would be appropriate in your opinion for one meal?

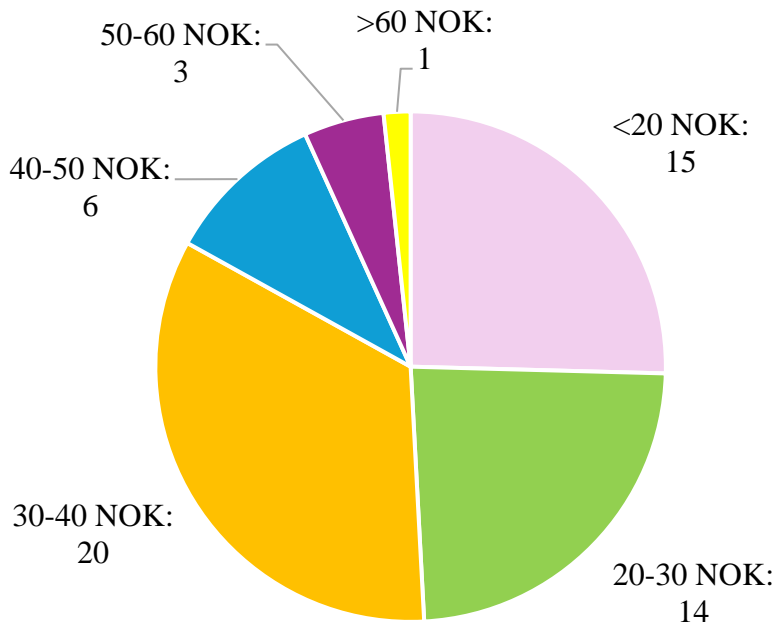


Figure 11: Results of question 8.

Parents who favored the organic attribute were willing to pay between 20 NOK and 40 NOK for a warm school meal. However, parents classified organic attributes as less important than other attributes. The parents were more willing to pay extra for healthy food and variety.

From the parents willing to pay extra for a warm meal, 18 indicated that 30 NOK to 40 NOK are justified for a healthy meal, and 15 categorized 30 NOK to 40 NOK as justified for meals with a variety of food.

Regarding the weekly amount of the lunch offer usage, parents who answered that their child would use the lunch offer five times a week would also consider paying up to 40 NOK. In addition, six parents would like to not pay extra and still receive the lunch offer for the pupils five days a week.

Question 9. contained a textbox and provided room for the parents to give feedback on the canteen offer and what could be improved. Of 62 participants, 34 used the textbox. The Norwegian comments were translated into English and categorized into subgroups: *frequency*, *variety*, *pass/satisfied*, *inclusiveness*, *lunch process*, and *lunch*, which incorporate the hindering forces of *budget* and *repeating meals* and the supporting forces of *wellbeing* and *education*. Of the 34 comments, seven stated satisfaction with the lunch offer or ‘passed’ on clarifying

improvement wishes. An additional three comments included the wish to restrict processed sugar and processed food, reduce salt content, and visualized a wish for improvement.

“Less salt and sugar content. Also avoid ultra-processed foods.” (answer to question 9.)

Four comments included ideas for improvement about the lunch offer, for instance, that more food should be offered to the students instead of the teachers and that these could help serve lunch. Additionally, the idea was mentioned that pupils should see how the food is prepared. The importance of inclusiveness was mentioned in three comments, stating that parents have several pupils at school and that it needs to be affordable for everyone, and not exclude anyone. Eleven of the 62 parents participating in the questionnaire stated that they have several children at this school. The aspect of financial inclusiveness is included in the hindering force *budget*.

“If a school meal is not free, it is important that it is not too expensive. Often families have several children in school, and it quickly becomes expensive and exclusionary. A school meal should be inclusive.” (answer to question 9.)

The categories frequency and variety were mentioned the most, nine and seventeen times, respectively. The comments mentioned the wish for an extended lunch offer to several days a week.

“Introduce hot food five days a week + fruit/vegetables at least twice a day.” (answer to question 9.)

Linked to the variety, the focus on hot food was mentioned, and the wish for side dishes that included more vegetables was also stated. Three parents wrote in the textbox the wish for less porridge offered during lunch.

“A little more side dish in the form of vegetables e.g., salad or vegetables with the hot food.” (answer to question 9)

The last question allowed the parents to give feedback and express further thoughts; 16 out of 62 participants used this. The comments were grouped into the same categories mentioned

above. Half the comments expressed their gratitude and satisfaction with the current lunch offer and mentioned the pupils’ appreciation of the school.

“I hope the school meal program will continue. I see that the children and young people appreciate the school meal during the week.” (answer to the feedback textbox)

“We experience the days with school lunch very positively, less stress in terms of making sure that our own school food is in the backpacks. A very good initiative!” (answer to the feedback textbox)

Two more comments included the wish for an extension. Five comments repeated the importance of the lunch offer’ inclusiveness, which includes either keeping the meals free or at a reasonable price, which is incorporated into the hindering force *budget*. Tables A6 and A7 in *Appendix VII*. provide an overview of the comments submitted in the survey textboxes.

5. Discussion

5.1 Results

In the interviews, photovoice, and survey, hindering and supporting forces concerning the development of a daily school canteen supplied with organic and local food of educational value were detected. Figure 12 provides an overview of these forces.

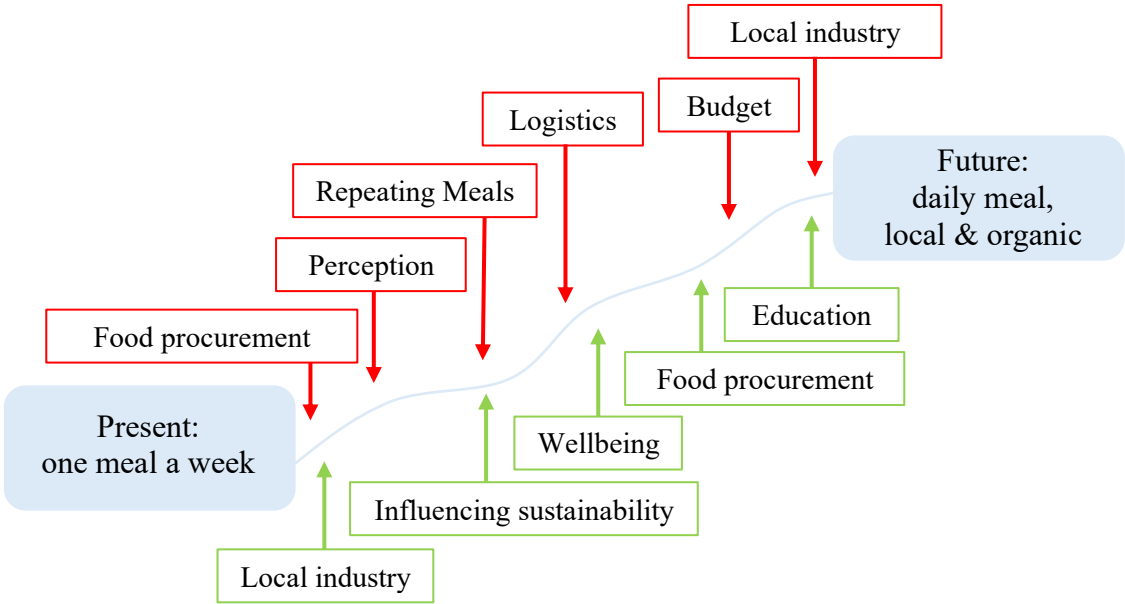


Figure 12: Overview of the detected hindering and supporting forces

The framework of *food procurement*, after which the school canteen works, functions as a supporting and hindering force. The company Abacus performs the procurement process for Tolga Municipality and is responsible for negotiating price agreements with suppliers (information taken from the interview). The mayor stated that when renewing the deals in the future, the focus will be on increasing the local shares within the deals as already done by the neighboring town Røros. This links to the interview with the regional procurement consultant, mentioning the possibility of increasing the local shares in tenders.

Swensson and Tartanac (2020) mentioned that public companies are not free to choose what, how, and from whom they purchase food due to the regulatory framework. As a result of their analysis of the potential of public food procurement to influence consumption patterns, mechanisms that allow the inclusion of more sustainable food options in the contracts exist. According to the procurement consultant and Grandia and Voncken (2019), if knowledge and competencies regarding the rules of the procurement system are not sufficiently existing, it can work contrary to introducing more local and organic food. For instance, Smith et al. (2016) mentioned an opportunity, which included an EU reform allowing smaller companies to bid on procurement deals by changing the regulations and dividing it into smaller deals, which the mayor and procurement consultant also introduced. However, the difficulty in interpreting the regulations was also analyzed in the case study conducted by Smith et al. (2016) concerning food procurement in the public sector. Transforming companies' goals into tenders can be challenging, including increasing the share of sustainable products in tenders and executing this procedure (Tregear et al., 2022).

The *local industry* was classified as both a supporting and a hindering force. The canteen allows the local industry to grow by supporting and purchasing local food. Moreover, the local industry can support the canteen by purchasing food and ordering meals for meetings (information from the interview). The mayor supported growing the local industry to enhance sovereignty and secure the national food system. A hindering force regarding the local industry that the mayor mentioned is the delivery system of local companies, who have not expanded their system and are therefore unable to deliver year-round. A countermeasure he mentioned could be seasonal deals implemented in the more significant deals to allow smaller companies to deliver seasonal goods while the rest will be delivered through the centralization system. Further, the procurement consultant mentioned the opportunity to split deals into smaller ones to make them available for smaller companies, which links to the supporting and hindering force of food procurement.

The mayor and canteen leader mentioned in the interview that local and organic food is something they want to increase and is preferred. The region of Tolga Municipality provides a lot of clean and sustainable food, as mentioned in the mayor's interview. However, comparing this with the survey, the parents classified organic and local attributes as less important than others. The appropriate price for a local meal was classified as higher than for organic meals. The motivation to buy local food varies and includes factors such as supporting the local industry, traditional reasons, and driven by the community, as mentioned by Skallerud and Wien (2019), which, in the case of Tolga Municipality links to the source of clean food originating from this region. In the literature review by Molin et al. (2021), local food was perceived as environmentally more sustainable due to the reduction of food miles while providing an opportunity to support and grow the local industry, and organic food was generally perceived as healthier and more environmentally sustainable due to reduced fertilizer and chemical usage.

Introducing local and organic food in the school canteen can increase the purchase price of the groceries since these are generally more expensive, as mentioned by the interviewees. This constraining factor of the price is represented in the hindering force of the *budget*. Currently, only meat is procured locally and in organic quality since purchasing all goods from local and organic producers would be too expensive (information taken from the interviews). However, as mentioned by the mayor, procuring local food brings tax revenue back into the municipality and, therefore, supports and grows the local industry.

In the research done by Filippini et al. (2018) on public school food procurement, the price of organic food was considered a constraint to increasing the amount of organic food offered and not a constraint to the general introduction of organic food. A countermeasure mentioned in their research was to reduce the meat content in the meals while increasing the vegetable content to counteract the higher prices of organic food (Filippini et al., 2018). The constraining factors of the increased price of organic food and the difficulty of delivering seasonal food were also detected in the research of Conner et al. (2010), who investigated the introduction of local and sustainable produce in school meals.

Another factor presenting the *budget* as a hindering force is the limited budget for food in the municipality, resulting in limited funding for school meals, as mentioned in the interviews. The set budget pays for the school meals and the canteen staff. A question that arose from the interviews is the willingness of the parents to pay extra for a warm meal to counteract the funding shortages in the municipality while extending the offer and providing more resources to plan meals. The parents' perception plays a vital role in extending the lunch offer and can

counteract the limited funding. The interviews revealed the parent's *perception* as a hindering force. The canteen leader stated that due to the free school principle in Norway, parents might not be willing to pay extra for a warm meal. However, according to the survey results 48 from 62 parents are willing to pay extra for warm meals throughout the week. Connected to this, the headmaster explained that equalness towards a home-bought meal needs to be ensured in case of a price formation. Currently, the canteen leader has around 10 NOK to 15 NOK to calculate per meal per pupil, which results in serving porridge every third time to reduce the general costs. In order to increase the share of local and organic food in the school canteen, the budget needs to be increased since these groceries are generally more expensive as stated by the interviewees. Therefore, a countermeasure of the hindering force would be to include the parents in the lunch extension to enable a daily canteen offer. The survey showed that most parents would be willing to pay extra, on average between 20 NOK to 40 NOK per meal. However, as mentioned in the survey, the price of a meal should be appropriate that it is available to everyone. Since the mean income in Tolga Municipality is under the Norwegian national income (Statistisk sentralbyrå b), it is necessary to include the parents in the price formation to keep the lunch inclusive.

Some parents stated in the survey that they wish to have daily school meals for free in order to be available for everyone. As Illøkken et al. (2021) and Vik et al. (2019) mentioned, free meals prevent inequalities between pupils and allow every pupil to receive and benefit from a healthy meal. Linking this to their results from the 'School Meal Projected' conducted in Norway, which suggest that pupils benefit from a more varied diet throughout this program since food is introduced that might not be common in their households (Illøkken et al., 2021; Vik et al., 2019). The effect of a free meal on social inclusion was further detected by the research done by Heim et al. (2022) on introducing a free meal in Norwegian schools.

Another factor represented in the hindering force of *perception* is the need to change consumers' consumption patterns to influence the sustainability of school meals. As stated in the survey-textbox, a wish for more fish and chicken in the meals was mentioned. According to the procurement consultant, it might be difficult for consumers to accept reducing their meat consumption since this is a typical income source in this area and widespread. Therefore, as mentioned by the procurement consultant, instead of restricting meat in school meals, pupils should be introduced to meals with less meat to show and teach about other meal options.

As analyzed in the research done by Perez-Neira et al. (2021) on school meals, meat and fish ingredients contributed to the most significant impact on the environment compared to other

meal components. Exchanging high-impact animal products, such as beef, with lower-impact meat or legumes can reduce the effect. However, offering exclusively vegetarian meals can result in reduced lunch participation by pupils and increased food waste (Eustachio Colombo et al., 2020) since vegetables are the main staple thrown away at lunch (Capper et al., 2019). This links to the participant observation, in which it was clarified by the teachers, that more vegetables are served for the 8th to 10th graders, since the acceptance is higher than among the 1st to 7th graders.

Next to reducing meat consumption, the school canteen provides other options to *influence sustainability*, which is classified as a supporting force. It allows the reuse of food leftovers, as mentioned by the canteen leader and procurement consultant. Leftovers will be reused in the following days or given to SFO, resulting in a reduction of food waste. Nevertheless, the food storage and usage of leftovers need to follow regulations to ensure food safety, as mentioned by the canteen leader, procurement consultant, and Helsedirektoratet (2015). Therefore, food cannot be reheated several times and must be thrown away if not consumed (information taken from the interviews).

Other factors contributing to increased food waste are limited eating time and restricted meal planning due to uncertain consumer numbers (Capper et al., 2019). However, in the case of Tolga school, these factors are limited due to having a longer lunch break than recommended by Helsedirektoratet (2015) and having a specific amount of portions that need to be prepared for the pupils. However, the amount of external costumers is not predictable since these can come by without pre-registration. To counteract this, the *Microsoft Teams* group, which us used to notify about food leftovers, could be used for a lunch registration to facilitate the planning process.

Another factor that can work favorably on the sustainability of school meals is the usage of seasonal and national products (Molin et al., 2021; Reisch et al., 2013). As mentioned by the canteen leader, when planning meals, she focusses on seasonal food and ingredients produced in Norway, which is not always feasible, due to the delivery system as mentioned by the mayor.

Linked to the *wellbeing* of the pupils and the importance of school meals, the hindering force of *repeating meals* was mentioned in the photovoice discussion with the pupils and in the survey textboxes filled out by the parents. The pupils mentioned their dislike of the too often served porridge in the same variation with butter, sugar, and cinnamon. Linked to this, the parents mentioned the wish for less porridge in the survey textboxes. As stated by the canteen leader,

porridge is a cost-efficient meal and allows for a reduction in the cost of the meals to purchase higher-priced goods for other meals, such as local and organic meat. As the former FH teacher mentioned, a countermeasure for the same porridge variation could be the exchange of sugar with honey. Another possibility to increase the local factor of the offered porridge would be the usage of Norwegian grains instead of rice. For instance, the institution Matvalget provides recipes with different grains, such as oats and barley, combined with fruits like apples and pears and dry fruits or spices like cinnamon or cardamom to increase the porridge variation (Matvalget). These countermeasures link to the comments made by the parents, wishing for more variety, less sugary foods, and introducing fruits into the school day. This also aligns with the guidelines established by the Directorate of Health, which recommends reducing sugar content and introducing more fruits (Helsedirektoratet).

As stated by Oostindjer et al. (2017), even though the pupils' interest in the school food should be focused since the offer is directed to them, they might want something other than the healthiest food options. This links to the research done by Holthe et al. (2011) on the barriers to introducing the Norwegian national guidelines for school meals, which states that the taste and the variety of the served food affect the lunch offer usage by the pupils. A countermeasure would be, as mentioned in Storcksdieck genannt Bonsmann (2014), a 'menu cycle', which some canteens introduce where a dish is repeated after a specific period, for instance, after 20 days, to ensure variety.

The lunch break and school meals provide room for educating pupils about healthy eating habits and new foods, which the interviewees mentioned, and therefore, classify *education* as a supporting force. As stated by the canteen leader, she tries to introduce new foods and pair them with known food to expose the pupils to new tastes. Teachers accompanying the lunch break further encourage pupils to try the new food. Pupils know in advance which meal is served, and if it is not preferred, pupils bring their lunch box, resulting in increased food waste in the canteen. Therefore, mainly meals are chosen that pupils accept to reduce food waste. However, this prevents exposure to other foods that might not be as favored by the pupils or common in their households, which would contribute to the educational effect (Capper et al., 2019; Illøkken et al., 2021).

Introducing more local food at school teaches pupils about the origin of the products they consume and can contribute to shaping responsible food habits (Skallerud & Wien, 2019). The education of traditional food in Tolga is mainly focused on the Food and Health course since traditional food is generally heavier and more suitable for physical work than providing the foundation for an improved school performance, as the former FH teacher mentioned.

Another educational possibility is including the pupils in the process (information taken from the interview). Pupils can suggest meals and vote on these suggestions, as mentioned in the photovoice discussion and the interview with the canteen leader. This provides the opportunity to implement meal options that the children favor. Additionally, pupils help set and clean the tables during the lunch break, which was observed during participant observation, which teaches them responsibility, according to a teacher.

Educating children about healthy lifestyles and eating habits can be beneficial throughout their lives. Other potential learning arenas at school include school garden programs, school meals, nutrition classes, and physical education (Chortatos et al., 2018; Storcksdieck genannt Bonsmann, 2014), as represented at Tolga School. Further, as part of a canteen's business, pupils can sell self-made food on Fridays, which could counteract the daily canteen offer, to maintain this educational opportunity (information taken from the interview).

The lunch break and a shared meal allow pupils and teachers to socialize and sit with pupils from other classes. This was categorized as a supporting force in the interviews and photovoice and played into the theme of *wellbeing* and *education*. Observed in the research in the school in Tolga Municipality, the teacher sat among the pupils to talk to them, which was also described by the headmaster and linked to the Norwegian national guidelines on school meals established by Helsedirektoratet (2015), stating the importance of a teacher being present at lunch as a role model. Teachers socializing with pupils during the lunch break can positively impact their relationships and the classroom atmosphere, as mentioned by Illøkken et al. (2021). The benefits of sharing a school meal, including socializing and learning about table manners from each other, were further detected in the research on the 'School Meal Project' conducted in Norway by Illøkken et al. (2021). In the study on introducing free school meals in Norway by Heim et al. (2022), the benefits of socializing between pupils and teachers were also mentioned and included relationship-building and an improved learning atmosphere.

The supporting force of *wellbeing* was detected in the interviews, photovoice, and survey and refers mainly to the wellbeing of the pupils. As mentioned by the interviewees, a daily school canteen provides an opportunity for a warm and healthy meal and maintains the pupils' blood sugar to enhance their school performance. This links to Benvenuti et al. (2016), stating the importance of food and nutritional demands for children's development and activities.

However, in order to be able to provide a daily lunch offer, the logistics and canteen structure need to be accordingly. The *logistics* of a daily lunch offer were mentioned as a hindering force in the interview with the canteen leader and headmaster. According to the canteen leader, the

missing workforce could be a constraining factor in preparing food daily. The lack of space to prepare food and host the whole school in a day is also a constraining factor.

These limitations were also observed in the research done by Holthe et al. (2011) on implementing healthy meals based on the Norwegian national guidelines on school foods in three schools. In this course, the difficulty of implementing preparation facilities and an eating area for all the pupils was mentioned. In Norway, providing a daily warm school lunch is optional, resulting in a lack of canteens in schools (Holthe et al., 2011).

5.2 Methods and limitations

Several data collection methods in this research were used to help gain a holistic viewpoint while enhancing validity by triangulation, as mentioned in Creswell and Creswell (2018) and Clark et al. (2021). This includes the application of numerous approaches, linking these with each other and to existing literature to support and ensure the collected data. In this research, Tolga Municipality functioned as a case study to investigate the hindering and supporting forces behind the development of a daily school canteen. As mentioned in Clark et al. (2021) and Creswell and Creswell (2018), a case study is used to more intensively investigate a specific situation, in this case, the school canteen. This enables in-depth interviews and the inclusion of various stakeholders in the research. It also provides the school in Tolga Municipality with limits and possibilities for extending their current lunch offer. As mentioned by Yin (2009), results gained from a single case study are generalizable in the theoretical context, resulting in analytical generalization, rather than applicable to other populations since, in this case study, the school is not representing a sample under investigation but rather provides a frame to the analyzation of hindering and supporting forces. To reach external validity in this research, existing research was drawn upon and compared to the generated results in this case study (Clark et al., 2021).

In the interviews, biases were prevented, and reliability was ensured by including external readers for proofreading and correcting the established transcripts, codes, and the translation of the German interview into English (Creswell & Creswell, 2018). Limitations of interviews include selecting information based on what the interviewees find relevant (Creswell & Creswell, 2018). To counteract this, follow-up questions were asked for clarification purposes, and several participants were included in the interview methods. The results were linked to the other results and existing literature. To prevent unclear questions, the interview guide was tested beforehand and adjusted according to the received feedback.

Within the photovoice method, some limitations occurred; as mentioned by Creswell and Creswell (2018) and Wang and Burris (1997), the interpretation of various pictures can be complex. However, to bypass the limitations and interpretation biases, the pupils were asked to define and clarify their likes (as presented in their pictures) and their dislikes in a direct conversation. Further, to ensure the validity of this method (Clark et al., 2021), guidelines concerning the process of this method were established and, in cooperation with a Norwegian-speaking teacher, communicated to the participating pupils to clarify any questions.

In the survey with the pupils' parents, 62 out of 160 parents who received the questionnaire link participated. This presents a return rate of 38,8%. Clark et al. (2021) mention that a return rate should be around 45% to 50%. The return rate from this survey can be explained due to the link distribution via the app since not all parents of the school were contacted (160 out of 191), and only those who check the app regularly will receive the survey link. Another possibility would be the distribution to both parents and only participation of one of these. Since the participation was anonymous, this is not possible to clarify. In some questions, it would be essential to include all 191 parents, for instance, to clarify the willingness to pay for extra meals and the price to counteract the exclusiveness of the offer. In this case, the link might need to be distributed over both the app and email.

Since many different nationalities are represented in Tolga School, the survey was written in Norwegian and English to include as many as possible. Since I was not present while the participants filled out the questionnaire, the questions had to be precise and understandable, presenting a validity criteria. To ensure this, the questionnaire was pilot-tested beforehand and adjusted according to the feedback to ensure content validity, meaning the survey measured what was desired. To counteract unfinished questionnaires, the questions were kept short and minimal (Clark et al., 2021).

6. Conclusion

To conclude, daily school meals and health education at a young age allow children to be taught about healthy eating, consumption habits, and sustainability. This can affect their lives and contribute to reduced dietary-related diseases. Healthy and nutritious food is essential for children's development and contributes to their concentration during a school day. Linked to this, public food procurement can, to some degree, influence sustainability and consumer habits, favoring food with a lower environmental impact. Since providing warm school meals is not mandatory in Norway, this research investigated the supporting and hindering forces of the

development of a daily school canteen based on the case study of the school in Tolga Municipality. To answer the research question: ‘*What are supporting and hindering forces of a development of a daily school canteen supplied with local and organic food of educational value?*’, interviews with various stakeholders, a photovoice with the pupils, and a survey for the parents were conducted. In the course of this, the supporting forces of *wellbeing, food procurement, education, influencing sustainability, and local industry* were detected. The hindering forces comprise the *local industry, repeating meals, logistics, budget, perception, and food procurement*.

By providing daily school meals, pupils can be introduced to more varied meals to enhance the educational effect. Therefore, introducing local food helps teach about food traditions and regional food producers. Organic products can increase sustainability and education about healthy eating habits. However, the parents did not classify organic and local food attributes as important as healthy and varied meals. The focus should first be on increasing the variety and frequency of the lunch offer. Thereby, the offer can be increased slowly to counteract the hindering forces detected in this research. To implement a daily canteen offer, it is important to counteract the hindering force of logistics to be able to serve the whole school in a day. Therefore, the space and workforce need to be increased. This links to the need for a higher budget to enhance the capacity and procure more food. Parents should be involved in the price formation to ensure an inclusive meal price and give the canteen leader a higher budget when planning meals to enhance food variety and local and organic produce. To counteract the increased prices of organic food, the meat content can be reduced while the vegetable content is increased. This also allows the pupils to learn healthier and more sustainable eating habits with reduced meat content.

Overall, daily school meals support, among others, the pupils’ wellbeing, provide educational situations, and can support the local industry. Nevertheless, when the forces are being weighed against each other, the hindering forces predominate since the total budget needs to cover increased workforce, food, and extending the space and kitchen facilities, which links to the hindering force of the logistics.

Therefore, further research could continue to specify action plans to counteract the hindering forces detected in this research and analyze the sustainability of local food in Tolga Municipality and.

7. Reflection

This research challenged me, taught me meaningful lessons, contributed to making me feel like a researcher, and got me out of my comfort zone. Being guided by the ‘German way’ of scientific writing and research, I had clear demands on myself and a plan I needed to stick to. Being forced to leave this strict structure and find a way that works for me without having a mandatory framework was challenging at first, but it allowed me to grow and find out what works best for me. It was challenging for me to diverge from my usually very strictly organized and planned self to letting things happen and adapt to the circumstances in Tolga. And that ‘change’ was needed, not only as a lesson for me as a researcher, but also to allow other things to contribute to my results and remind me to go into the research with an open mind. In the fieldtrips we did in the first semester, our stakeholders in Tolga called themselves ‘potatoes’, meaning that they are adaptable to change, so I tried to become a potato myself.

It was advantageous to have been to Tolga before, to know the people, and to plan a continuation of the action plans that we established in the past. I knew a lot from before, but it was important to have a clear start in case something has changed over the years, which it did. I knew to whom I could go and who to include in my thesis. The first fieldtrip of this research allowed me to network and schedule two more interviews that would not have happened otherwise. Also, staying in Tolga longer on the second field trip allowed me to talk to several other people, schedule another interview, and have enough time to reflect on my process and the results. After each interview I conducted, I felt safer and more confident. It allowed me to ask other follow-up questions more easily without planning everything before. Using different methods allowed me to include several stakeholders, which aimed to receive a holistic viewpoint on the research question.

Having the opportunity to stay longer in Tolga contributed to my feeling of being more present in my research, feeling connected to the case and the stakeholders, and observing the atmosphere in which this research was embedded. It also allowed me to participate in events and visit the canteen in different settings, which showed the relationship that the school, teachers, workers, and pupils have to food and food education.

Looking back on my research, I would have chosen to do a few things differently. It would have been beneficial to include a third fieldtrip later on to spread out the applied methods. It would allow me to visit the lunch break more often to observe the procedure and even accompany the lunch preparation process. Concerning the survey, it would have been beneficial to find other distribution opportunities to reach more parents and increase the return rate.

I hope the work I did in my research will help bring Tolga closer to their wish of an extended lunch offer as mentioned in the visionary session in 2022 and in the methods in this research. I hope it gives them an overview of the hindering forces that might affect the establishment and also points out the supporting forces, showing them the people's appreciation for their work and the school food. I hope to give something back with this thesis as a thank you for allowing me to practice my agroecology competencies, apply my research methods, and write my thesis in Tolga. I had an amazing time doing my research, I felt welcomed and surprised by the openness and the enthusiasm of sharing their knowledge with me. This thesis work made me feel more confident in myself and trusting in the work I do. Realizing that it is okay to differ from a structure and still be happy with the outcome. Therefore, the mindset of being a potato can be beneficial in my life and make me more open to change.

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9. Appendices

Table of Content

I.	Methods: Literature research	ii
II.	Methods: Interviews	iii
III.	Methods: Survey.....	v
IV.	Methods: Participant observation.....	vii
V.	Results: Interviews	ix
VI.	Results: Photovoice	xi
VII.	Results: Survey.....	xiii

List of Figures

Figure A1: Flowchart example for the literature review	ii
Figure A2: Extract from the participant observation fieldnotes	vii

List of Tables

Table A1: Used interview guide	iii
Table A2: Used questionnaire and answer categories	v
Table A3: Supporting and hindering forces mentioned by the interviewees.....	ix
Table A4: Overview of submitted photos for the photovoice	xi
Table A5: Overview of the supporting and hindering forces mentioned in the photovoice.....	xii
Table A6: Submitted comments concerning question 9	xiii
Table A7: Overview of the submitted comments concerning the feedback	xv

I. Methods: Literature research

Literature research helped me examine the current state of research and gain an overview of elements included in the topic. Thereby, the search engines *Web of Science*, *PubMed*, and *Oria* were mainly used. Additionally, documents from the WHO, FAO, and the Norwegian Directorate of Health were used. The flowchart (Figure A1) visualizes the search process based on the example keyword *school canteen food* in the search engine *Web of Science*. After this process, the other search engines were used to find suitable literature for this work. Thereby, articles were excluded that were not relevant to the research topic based on the title, abstract, and the full text.

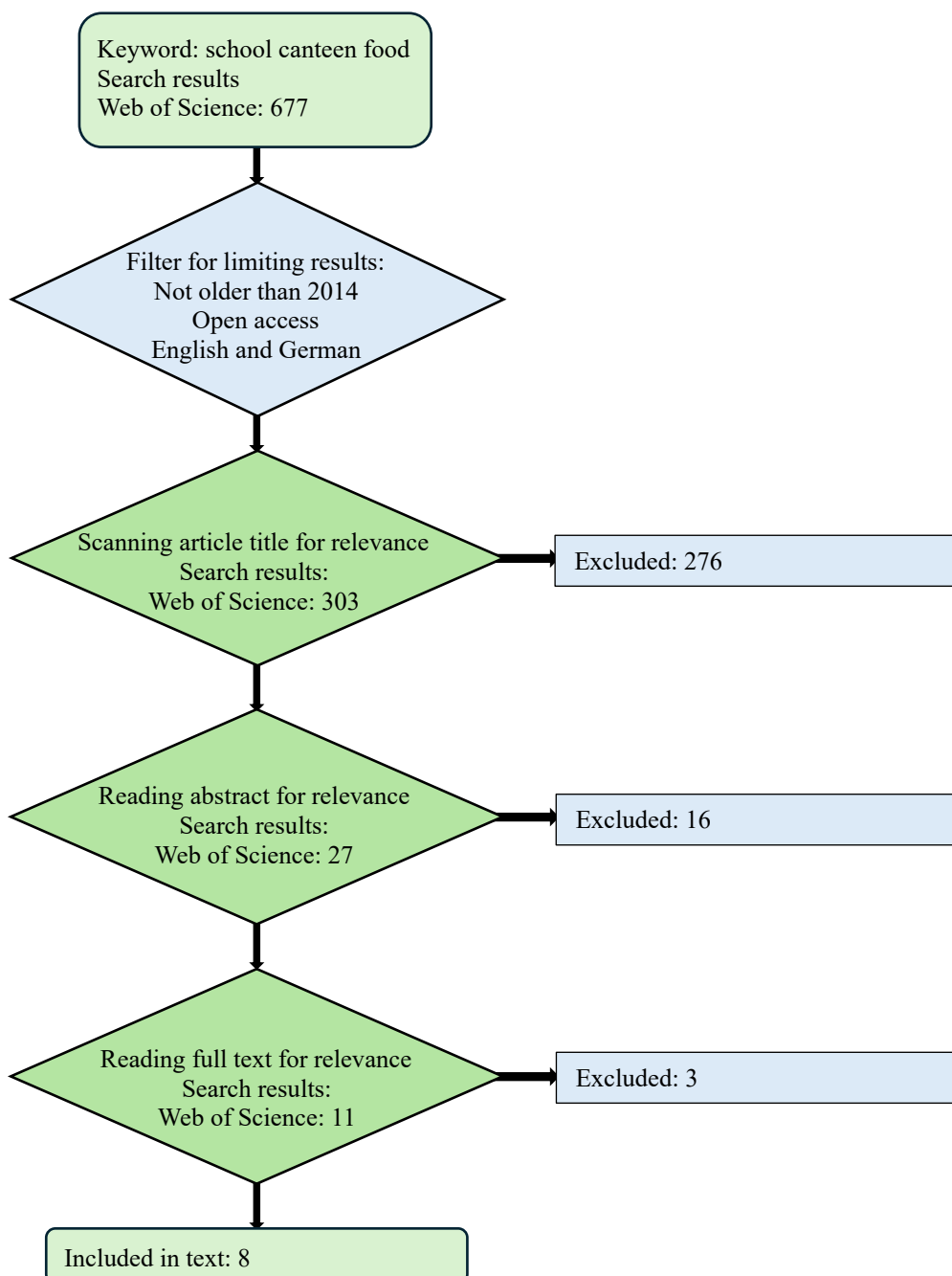


Figure A1: Flowchart Example for the literature review

II. Methods: Interviews

Table A1: Used interview guide

General information	<ul style="list-style-type: none"> • What are your position and responsibilities? • To what extent is food and nutrition implemented in the school?
School canteen	<ul style="list-style-type: none"> • Is it mandatory at Norwegian schools to have a canteen or a food offer? • When and how did the canteen lunch offer start? Who initiated it? • Are you in contact with other schools and know about their canteen concepts? • Tell me about the current canteen offer: What foods are allowed? Is it also organic and local? Do all children use it? I saw plenty of children with lunch boxes, can they freely choose if they want warm lunch? How do you plan on how much food you need to prepare? • How is the food currently prepared? • How do you establish the food plan? Do you introduce new foods for educational value? • Who can use the canteen offer? Was there advertisement that other people can use the offer too? • What happens when some kids are not able to eat the food because of allergy, dietary restriction? Are there alternatives they can eat? • Can you walk me through the process of a lunch break?
Food procurement	<ul style="list-style-type: none"> • Could you tell me a bit more about the current food procurement system in the municipality? • How is it possible to combine increased local food usage in connection to the EU tender system and equal competition in your opinion? Are there any ‘loopholes’ to increase local food usage even more? • Are there any boundaries for you in the procuring and planning process?

	<ul style="list-style-type: none"> • What is your perception of food procurement in Tolga? • Tolga already increased the usage of locally produced food. Do you think there is room for further increasing locally produced food? And if so, what are some requirements needed to increase locally produced food? • Do you consider sustainability in the procurement or when giving advice? And if so, how do you consider it? • What are other requirements you emphasize in food procurement? • How do you currently procure food? From where do you procure food? • What attributes do you consider when procuring food? Is organic food of interest? Is local food of interest?
Budget	<ul style="list-style-type: none"> • How is the budget set for the canteen? Who decides about the budget? • How much is the budget? • Are there budget adjustments? And if so, in what intervals? • Are there any subsidies from the Norwegian government for school canteens apart from the 15kr/meal from the hot meal project?
Perception	<ul style="list-style-type: none"> • How's your perception of the current lunch offer? • Do you use the canteen offer? And if so, what makes you use it? • Were students, parents, external customer asked about their opinion about the lunch offer? Do you know the attitude of the students, teachers, external customers about the canteen? • How do the kids react to the food? Do you see any differences in the acceptance when it comes to different kinds of foods? • How do you handle the big age gap and different eating habits from the students? Is it problematic? • Would you be open to an extended lunch offer? E.g. every day in a school week? If so, what in your opinion are requirements needed for this extension?

	<ul style="list-style-type: none"> • Is there anything you would like to change or improve, optimize in the canteen and its offer?
Ending	<ul style="list-style-type: none"> • Is there anything else you would like to add or talk about concerning the food situation in Tolga?

III. Methods: Survey

Table A2: Used questionnaire and answer categories

Question	Answer categories
1. I hvilket klassetrinn går ditt barn?/ In what grade is your child?	a. 1 b. 2 c. 3 d. 4 e. 5 f. 6 g. 7 h. 8 i. 9 j. 10
2. Benytter barnet ditt seg av lunsjtilbudet for øyeblikket? / Is your child currently using the lunch offer?	a. Ja / Yes b. Nei / No
3. Hvis nei, er det en grunn til det? / If no, is there a reason for it?	Textbox
4. Har barnet ditt noen kostholdsrestriksjoner eller allergier? / Does your child have any dietary restrictions or allergies?	Textbox
5. Hvilke egenskaper mener du er viktig for en skolelunsj? / In your opinion, what attributes are important for a school lunch?	a. Lokal / Local b. Økologisk / Organic c. Høy kvalitet / High quality d. Lav pris / Low price e. Sunn / Healthy

	<p>f. Variasjon / Variety</p> <p>g. Bærekraftig / Sustainable</p> <p>h. Fersk / Fresh</p> <p>i. Seasonbasert / Seasonal</p> <p>j. Bruk gjerne denne tekstboksen hvis du har andre viktige egenskaper for en skolelunsj / Feel free to use this textbox in case of other important attributes for a school lunch</p>
6. Hvis det var tilgjengelig, hvor ofte ville barnet ditt benyttet seg av lunsjtilbudet i løpet av en uke? / If available, how often would your child use the lunch offer a week?	<p>a. 1</p> <p>b. 2</p> <p>c. 3</p> <p>d. 4</p> <p>e. 5</p>
7. Er du villig til å betale ekstra for varme skolemåltider gjennom hele uken? / Would you be open to pay extra for warm school meals throughout the week?	<p>a. Ja / Yes</p> <p>b. Nei / No</p>
8. Hvis ja, hvor mye mener du er passende for ett måltid? / If yes, how much would be appropriate in your opinion for one meal?	<p>a. 20 NOK og/ and under</p> <p>b. 20-30 NOK</p> <p>c. 30-40 NOK</p> <p>d. 40-50 NOK</p> <p>e. 50-60 NOK</p> <p>f. 60 NOK og/ and over</p>
9. Hva mener du kan forbedres i skolelunsjtilbudet? / What in your opinion can be improved in the school lunch offer?	Textbox
Her er det rom for tilbakemeldinger og videre tanker: / Here is room for feedback and further thoughts:	Textbox

IV. Methods: Participant observation

Two participant observation took place, thereby, the focus was on the lunch process, food, and atmosphere. The aim was to gain an overview of the process of the current lunch offer and the atmosphere in the school. Figure A2 represents an extract from my fieldnotes from the participant observation in German. The following fieldnotes include statements (underlined> from the teachers that clarified questions I asked during the participant observation.

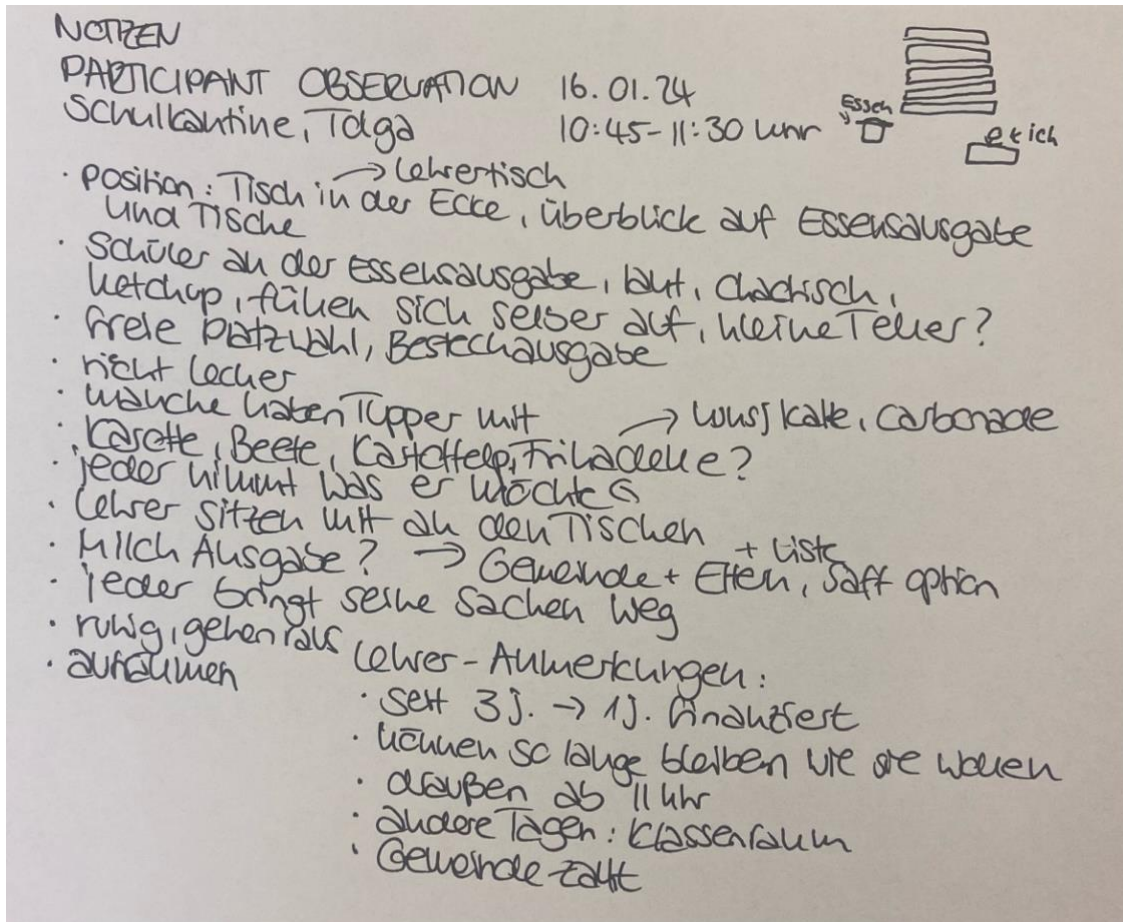


Figure A2: Extract from the participant observation fieldnotes

16th January 2024, 10:45-11:30am, Tolga school canteen, lunch break of 1st to 7th grader:

I sit in a corner of the school canteen to be able to observe the canteen during the lunch break. Later it turns out that it's a 'teacher' table which gave me the possibility to talk to some teachers, who also ate lunch. Five long tables are set parallel to each other, in certain distances from each other, filled water bottles were placed on the table for everyone to use. At the food distribution counter, ketchup bottles are placed and big metal containers containing the school food were standing. It is getting fuller, younger kids running around, looking at the food distribution counter, it smells good, like warm food, kids sit down at tables. Either having lunch boxes in

their hand, juice boxes, or plates filled with the lunch food. Today's food contained mash potatoes, Carbonara or lunsj kake (one with peas and carrots, one without), and a mix of carrots and beets. The portion size is adjusted for the children. Even the plates are smaller than regular plates. Some students have plates without meat cake, some without carrots and beets. Teacher stands at the table I sit at and gives out cutlery. Children take glasses that's also on the table I sit at. Children sit down freely, starting to eat their food. Teachers supervising lunch break in canteen and sit with the students or at my table. A teacher is standing at a table with a paper bag and a list, giving out milk or juice bottles. Some children put ketchup on the meat cake, people running around. 30 min break, children can eat as long they want and then go outside. Quiet and relaxed atmosphere, just monotone noise of people talking. Teachers getting smaller portion too and can take more afterward. Different elements on the plates can be freely chosen. Everyone eats and brings empty plates away. Everyone sits and eats their food, no screaming just talking. When finished, running around again. Order system for juice and milk through the municipality. Canteen offer started 3 years ago, one year was it subsidised from the government and now financed by a budget given from municipality to the school. Students walk away and leave tables clean. Children can stay in the canteen during the break. Outside break starts at 11am, but children decide how long they want to sit and eat. Today's lunch break was for 1st -7th grade, tomorrow for the 8th -10th grade. During the other lunchbreaks, students will eat their food in the classroom. 11.30am end of the break and it is empty again in the canteen. The canteen staff removes water bottles from the tables and tidies up.

17th January 2024, 10:50-11:30am, Tolga school canteen, lunch break of 8th to 10th grader:
Tables have same position as yesterday. I have same seat as yesterday, to be able to talk to different teachers. Today I eat the school food. A few students are in the canteen and putting glasses and water bottles on the tables. Lunch starts later than yesterday, 10:52am and the canteen is still empty. Teacher gives out milk/juice at a table based on a list, the students come to her to collect it. Canteen is filling up; students find a seat to sit down and are waiting. It is a quiet atmosphere, apart from normal talking noise. The canteen is getting fuller; it smells like food. The same food as yesterday is being served. The teachers are supervising the lunch break again while also sitting down to eat. They sit at a separate table. The tables are getting fuller. Some students have lunchboxes, most eat the school food. The teachers have a list with students whose turn it is to set and clean tables, it rotates every time, so everyone has to do it. Teacher says it teaches them being responsible for something. Today they serve more veggies with the older students, since they eat it. It is more quiet and settled than yesterday. The outside break is

later on, students can decide if they want to go out or stay in the canteen. The canteen gets empty again at 11:17am. Some students remain and sit in smaller groups to talk. The food is tasty. Everyone can take as much as they want and portion itself. Unused glasses stay on the table, everyone brings away their dirty plates and cutlery and puts it on a rolling table. The students who set the table, are also cleaning it again (wiping the tables, removing unused glasses and water bottles).

V. Results: Interviews

Table A3 provides an overview of the statements made in the interviews concerning the hindering and supporting forces.

Table A3: Supporting and hindering forces mentioned by the interviewees










Interview	Supporting forces	Hindering forces
Mayor	<ul style="list-style-type: none"> • People appreciate it • Highlight through the week to have a warm meal • External people can come to eat • To reduce number of pupils going to school hungry • Waivers in deals • Tax revenue • Supporting local industry • Local initiatives 	<ul style="list-style-type: none"> • Money shortage • Limited funding • Not mandatory by law • Delivery system of small local producers • Norwegian high wages/ social standard high that it will cost to produce locally
Headmaster	<ul style="list-style-type: none"> • To make sure everyone eats a warm meal • Social function • Canteen is for everyone • To see the pupils • Talk to teachers • Pupils talk more freely with each other • Mixing classes 	<ul style="list-style-type: none"> • Limited budget • Having the whole school in one day could be impractical • Lack of space

<p>Procurement consultant</p>	<ul style="list-style-type: none"> • EU procurement rules for local food • Reduce food waste by using the leftovers the next day 	<ul style="list-style-type: none"> • Afraid of challenging procurement rules • Knowledge and competence of procurement rules • Several deals for local food • Not all local producers want to deliver to the municipality • Costs of local food
<p>Canteen initiator, former FH teacher</p>	<ul style="list-style-type: none"> • Maintaining blood sugar to perform well at school • Importance of socialising 	<ul style="list-style-type: none"> • Local food is expensive
<p>FH teacher, canteen leader</p>	<ul style="list-style-type: none"> • Giving the opportunity to taste new food • Open for everyone in the municipality • Sitting with new people • Including children in the meal planning • Reuse food leftovers in the canteen • Socialising for teachers 	<ul style="list-style-type: none"> • Not enough room to prepare everything in the kitchen • More kitchen facilities • Not enough human resources • ‘Lunchbox nation’ • Limited Budget • Local and organic food more expensive • Difficult to plan amount of prepared food • Free school principle

VI. Results: Photovoice

The following pictures presented in Table A4 were taken by the pupils as part of the photovoice. Duplicates of pictures were removed; therefore, these pictures are only a selection. Additionally, this chapter includes a table that provides an overview of the given statements during the discussion about what makes them go to the canteen.

Table A4: Overview of submitted photos for the photovoice

Social	Food	Variety
		
		
		

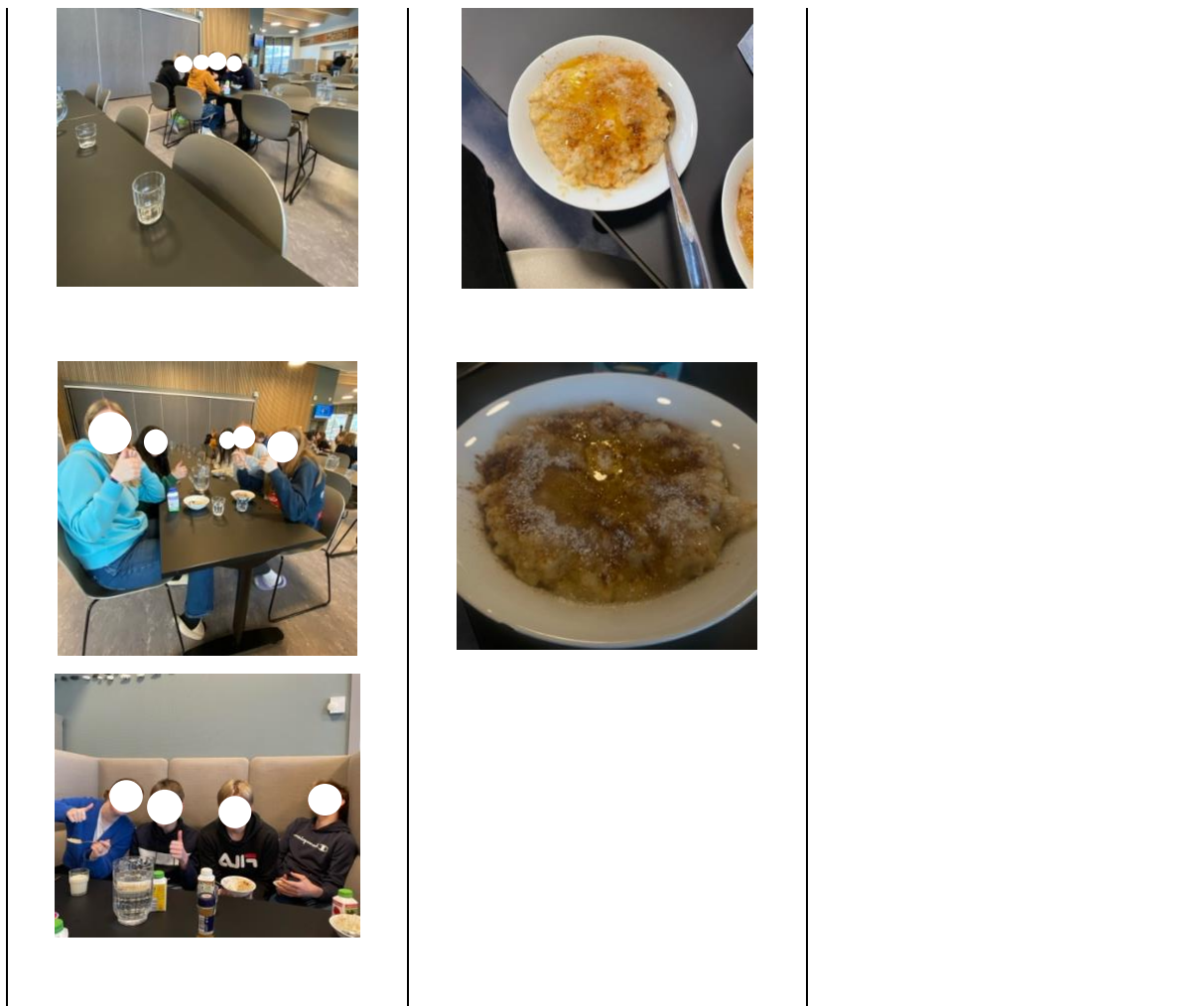


Table A5 includes statements made by the pupils in the discussion of the photovoice and is divided into supporting and hindering forces:

Table A5: Overview of the supporting and hindering forces mentioned in the photovoice

Themes	Supporting forces	Hindering forces
Social	<ul style="list-style-type: none"> • Hanging out and talking • Sitting with people • Socialising • Sitting together with all classes (mixing pupils) 	
Food	<ul style="list-style-type: none"> • Food is good • Free food • Feeling more stuffed 	<ul style="list-style-type: none"> • ‘Not really disliking anything’ • A lot of porridge

	<ul style="list-style-type: none"> Decide what to eat it, voting on what to eat based on suggestions, everyone can make suggestions 	
Variety	<ul style="list-style-type: none"> Not the same meal after another New food every time Diversity of food Variation of offered food New things to eat from week to week 	<ul style="list-style-type: none"> The same variation of porridge

VII. Results: Survey

Tables A6 and A7 provide an overview of the parent's comments made in the survey concerning their opinion on the canteen offer and feedback.

Table A6: Submitted comments concerning question 9

Submission: 34	N
Allerede et godt tilbud / Already a good offer	1
Det kunne kanskje være like viktig med frokost. Maten trenger ikke å være eksklusiv. Det er viktigst at den er tilgjengelig for alle / Perhaps breakfast could be just as important. The food doesn't have to be exclusive. It's more important that it's accessible to everyone.	1
Enda mer variasjon / Even more variety	1
Flere dager, å at all mat går til elever og ikke lærere / More days, so that all food goes to students and not teachers	1
Flere dager, mer fokus på varm mat og at de får være med å se hvordan mat blir laget / More days, more focus on hot food and that they get to see how food is made	1
Flere ganger i uka / More days a week	1
Fornøyd / Satisfied	1

Hjelp til servering av maten, slik at lærerene kan være til stede for elevene i stedet for å være kantinepersonell / Help with serving the food, so that teachers can be present for the students instead of being canteen staff	1
Ikke så ofte grøt, og at maten ikke var så salt / Not so often porridge, and that the food was not so salty	1
Innføre varm mat 5 dager i uken + frukt/grønnsaker minst 2 ganger daglig / Introduce hot food five days a week + fruit/vegetables at least twice a day	1
Jeg vet ikke / I don't know	2
Jeg vet ikke helt jeg vet ikke hva det har skal bety / I don't really know; I don't know what it's supposed to mean	1
Kanskje litt mer variasjon / Maybe a bit more variety	1
Less salt and sugar content. Also avoid ultra-processed foods.	1
Litt mer tilbehør i form av grønt. F.eks salat eller grønnsaker til varmmaten / A little more side dish in the form of vegetables e.g., salat or vegetables with the hot food	1
Mer variasjon / More variety	1
Mer variasjon. Mye grøt.../ More variety. Lots of porridge...	1
Mindre grøt, og mere mat med grønt og annet bra / Less porridge and more food with vegetables and other good things	1
No white processed sugar.	1
Oftere / More often	2
Oftere enn en gang per uke, Lokal, økologisk og sunn mat / More than once a week, local, organic, and healthy food	1
Om et skolemåltid ikke skal være gratis er det viktig at det ikke prises for høyt. Ofte har en familie flere barn i skole og det blir fort dyrt og eksklusiverende. Et skolemåltid bør (må) være inkluderende / If a school meal is not free, it is important that it is not too expensive. Often family has several children in school and it quickly becomes expensive and exclusioanry. A school meal should be inclusive	2
Pass	1
Skolen bør få med seg allergier. Kan ikke huske å ha blitt spurt. Mer variasjon og at foresatte eller elever kan ønske mer. Evnt om foreldre/besteforelde vil være med å ordne litt / The school should include allergies. Can't remember being asked. More variety and that parents or pupils may want more. Possibly if parents/ grandparents want to help to arrange something	1
Større variasjon / Larger variety	1

Tilbud om mere lunsj på skolen / Offer more lunch at school	1
Tilbud om sunn, variert og varm lunch fler dager i uken / Offer a healthy, varied, and hot lunch several days a week	1
Trenger mer utvalg. Hvis f.eks han spiser ikke fisk, bra hvis han kan velge noen annet / Need more choice. If, e.g., he doesn't eat fish, good if he can choose something else	1
Variasjon / Variety	2
Variert og fint.utfordrer litt til å smake på.Fisk er fint. Kylling er noe som kan brukes mer / Varied and nice. Challenges a little to taste, fish is nice. Chicken is something that could be used more.	1

Table A7: Overview of the submitted comments concerning the feedback

Submission: 16	N
Bruke mere kylling og fisk. Variasjon er kjempebra / Use more chicken and fish. Variety is awesome	1
Det er mye god lokal mat på Tolga og håpet om nok tilskudd til folk som kan tilberede maten / There is a lot of good local food in Tolga and the hope is that enough people will be able to prepare the food	1
Gjerne skolelunsj hver dag, da som et gratis tilbud eller til en rimelig pris / Preferably school lunch every day, then as a free offer or at a reasonable price	1
Håper tilbudet om skolemat fortsetter. Ser at barna og ungdommene setter pris på skolemåltidet i løpet av uka / I hope the school meal programme will continue. I see that the children and young people appreciate the school meal during the week	1
Jeg er fornøyd / I am satisfied	1
Nei / No	1
Om et skolemåltid ikke skal være gratis er det viktig at det ikke prises for høyt. Ofte har en familie flere barn i skole og det blir fort dyrt og ekskluderende. Et skolemåltid bør (må) være inkluderende / If a school meal is not free, it is important that it is not too expensive. Often family has several children in school and it quickly becomes expensive and exclusioanry. A school meal should be inclusive	3
Pass	1

Som skrevet i forrige tekst synes jeg det er viktigst at alle har lik mulighet til å bruke tilbudet. Det neste er at maten er sunn og næringsrik / Like I wrote in the last text, I think it's most important that everyone has equal opportunities to use the programme. The next thing is that the food is healthy and nutritious.	1
Supert tilbud, skaper fellesskap og gode vaner / Great offer, creates community and good habits	1
Supert tilbud, ungene setter pris på det. Kommentar hjemme: "Å, I dag slipper jeg å ordne skolemat" / Great offer, the kids appreciate it. Comment at home: 'Oh, today I don't have to organise school meals'	1
Vi er takknemlig for skolelunsjen / We are grateful for the school lunch	1
Vi er veldig glad for gratis mat tilbudet. Tusen takk. Barna trenger varmt mat, det er veldig viktig for den voksende kroppen men ikke bare 1 dag per uke / We are very happy about the free food offer. Thank you very much. The children need hot food, it is very important for the growing body but not only 1 day per week	1
Vi opplever dagene med skolelunsj meget positivt, mindre stress mtp å sørge for at egen skolemat blir med i sekken. Et veldig bra tiltak! / We experience the days with school lunch very positivley, less stress in terms of making sure that our own school food is in the backpacks. A very good initiative!	1



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