

# Barriers and Facilitators to Implementing Sustainable School Meals in Swedish High School – A Qualitative Study with Students and Meal Staff

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## Research Article

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# Abstract

**Background:** Adoption of more sustainable diets is necessary to preserve human and planetary health. The reach of the school meal system makes it an ideal setting to focus a food-related intervention towards more sustainable meals. The motivation to shift to more sustainable eating is increasing in the younger generation. However, there is currently limited insight into why and how these preferences develop and can be promoted.

**Aim:** To explore barriers and facilitators to implementing sustainable school meals in the Swedish high school setting.

**Methods:** This study employed a mixed inductive-deductive qualitative design. Interviews with high school students (n=16) and school kitchen staff (n=3) were conducted and transcribed verbatim. Data was first analysed inductively using qualitative content analysis. Emerging barriers and facilitators were consequently mapped deductively onto the domains of the Consolidated Framework of Implementation Research (CFIR).

**Results:** Ten barriers and seven facilitators to implementing more sustainable high school meals emerged. These belonged to two domains of the CFIR: individual characteristics of students and kitchen staff and inner setting factors such as school meal environment and relationships between stakeholders. Barriers included a low desirability toward vegetarian meals as well as lack of knowledge on the nutritional value of plant-based proteins among students. A barrier for the meal staff was that they were less inclined to prepare more plant-based meals which were perceived as less acceptable among students. Facilitators included a common interest in change towards sustainable meals and a good relationship between students and meal staff. Also, kitchen staff perceived that they have the knowledge and resources necessary to implement change.

**Conclusion:** Prioritizing students' food preferences as well as their knowledge about food and sustainability is likely to be key, but possible not enough, to achieve successful implementation of sustainable school meals. Co-creation with consumers and providers could provide an important opportunity to reaching higher acceptability of new meals and thus avoiding food waste.

## Background

A transformation of our food systems, including wide-scale adoption of more sustainable (i.e. plant dominated) diets, is needed to achieve food security and preserve the environment on which human health depends (1). Such action will be required to keep in alignment with the Paris Climate Agreement and the Sustainable Development Goals, particularly goals 2 (zero hunger), 3 (good health), 12 (responsible consumption), and 13 (climate action) (2–4). Different foods might be nutritionally interchangeable, but their environmental impacts can vastly differ (5). Today's food system will not be able to feed a growing world population within planetary boundaries if diets are not changed to become more sustainable, especially in high-income countries (5–7). Due to their reach and scale, school meals

have been identified as a near-unique opportunity to foster both healthy and sustainable dietary patterns (8).

During the recent United N Food Systems Summit 2021 a new global coalition for school meals was formed with the aim to ensure that nutritious school meals are provided sustainably to all children by 2030 (9). Young people are the most important actors when it comes to dietary change, since their food habits are more modifiable than that of older people and the motivation for change is high (10). Previous studies show that relatively minor changes to school meal composition can considerably reduce greenhouse gas emissions (GHGE) from meals while maintaining or improving nutritional adequacy. In doing so, costs can also be maintained or reduced (2). The OPTIMAT study was conducted in primary schools in Sweden, showing that GHGE from school meals could be reduced by up to 40% without decreasing consumption or increasing food waste (2). Interviews with students and kitchen staff after having experienced the new school meals exposed a need for more knowledge on the importance of sustainable meals and how to prepare them to improve acceptability (16).

In Sweden, school meals are free of cost for all families and account for around half of children's vegetable intake, about two thirds of their fish intake, and about one third of their meat intake thus contributing significantly to the nutritional quality of children's diets (12). There are no specific rules as what has to be served, but the school law states that meals must be safe, nutritious, tasty, served in a pleasant environment, and "eco-smart" according to the Swedish Food Agency's guidelines (13,14). Students can most often choose among two self-served warm meal alternatives along with a salad buffe, bread, water, and milk. With a large public investment going into school meals, the opportunity for these meals to widely influence sustainable food choices is evident, and schools around the country are open to making changes to their school meals for the reason of sustainability (15).

While the opportunities to improve school meals in Swedish primary schools have been explored (16), there are no studies to our knowledge that have explored high school students' attitudes toward sustainable meals in Sweden or elsewhere. Compared to younger students, the high school students have more autonomy to make decisions about their food by e.g. leaving the school grounds to buy food from nearby shops/vendors. Therefore, the aim of this study was to explore barriers and facilitators to implementing sustainable school meals among high school students in order to prepare for implementation of an intervention like OPTIMAT in the high school setting.

## **Methods**

### **Aim**

The aim of this study was to explore barriers and facilitators to implementing sustainable school meals in the Swedish high school setting.

### **Study design**

This study employed a qualitative design to identify barriers and facilitators to successful implementation of sustainable school meals in a Swedish high school setting. Individual interviews with high school students and school kitchen staff were conducted.

## **Setting and Recruitment**

A high school in the same municipality as in the first OPTIMAT intervention study, from which the present study was inspired, (16) was selected using previously established contacts. In the municipality, the school menus are planned centrally by a meal planner (12). The principal of the high school was contacted via email in November 2020 to inquire about their interest in participating, and then received brief information about the study. To schedule the interviews, the principal was contacted along with the head of the kitchen in February of 2021. It was planned to sample participants purposively but due to the ongoing covid-19 pandemic, selection of participants had to be done through convenience sampling in the school's cafe in agreement with the principal. The students and kitchen staff were approached to explain about the study and asked if they were interested in participating.

## **Data Collection**

In-person individual interviews were conducted between February and May of 2021 at the high school, in a place selected together with the participants. Interviews lasted between ten and twenty minutes and were conducted in Swedish. All interviews were audio-recorded.

The interview guide (**Additional file 2**) was designed based on the Interview Guide Tool in CFIR, with questions pre-designed to match constructs of the framework (18). CFIR uses theoretical constructs in five domains to describe contextual determinants that influence the success of implementation, though the results did not turn out to be relevant to all domains (19). The five domains are: intervention characteristics, outer setting, inner setting, characteristics of individuals, and intervention process (19).

Predetermined topics with open-ended questions were outlined in a semi-structured interview guide. Complementary questions were included in the guide to provide the opportunity for further exploration when deemed appropriate by the interviewer. The topics covered in the interview guide were designed to capture the participants' perceptions of their school meals in general and their attitudes and ideas on sustainable eating and healthy eating.

## **Reflexivity**

In this study, reflexivity was applied in the whole research process by the team of researchers. The first author, that also conducted the interviews, maintained awareness of the individual role as a female with Sweden as a secondary context and as a vegan with strong interest in plant-based eating and its relevance to environmental wellness. The research team consisted of researchers with different backgrounds, including public health and nutrition. The whole team was involved in analysis. Reporting on interviews allowed the authors to actively maintain a critical awareness of personal influences on the study.

## Participants

The study sample consisted of 16 students and three school kitchen staff. Participation in the interviews was on a volunteer basis, and no students or kitchen staff willing to participate were excluded. The students were five first year students (age 16-17 years), four second year (age 17-18 years), and seven third year (age 18-19 years) students with 50% identifying as males and 50% identifying as females. Of the three kitchen staff participants, one was the head of the kitchen, one was a cook, and the third was a kitchen assistant. They were all female and had worked at the high school in question for 20, 10, and 14 years, respectively.

## Data analysis

Data analysis was done both inductively and deductively. Initially, an inductive data analysis was conducted guided by Elo and Kyngäs (20) followed by a deductive mapping step guided by CFIR to explore barriers and facilitators to a future implementation of sustainable meals in school. The goal of the analysis was to provide a condensed description of the determinants, guided by the constructs provided by CFIR. Thus, the primary qualitative data was interpreted through a systematic coding of the text (20,21). The interviews were transcribed verbatim, then meaning units were extracted and condensed (20). Condensed meaning units (CMU) were grouped inductively with other CMUs with the same topic and given a code to describe the topic. Finally, all codes were mapped deductively onto CFIR domains (characteristics of individuals, inner setting, outer setting, intervention characteristics, and intervention process). Mapping was further guided by relevant constructs, and the codes were identified as being either a barrier or a facilitator of sustainable school meals. As interviews were conducted in Swedish, the coding was done in Swedish with only the findings being translated to English (done by CM, native English speaker with full command of the Swedish language) so as not to lose any meaning through translation.

## Results

Content from the interviews was grouped into two categories, including characteristics of students and kitchen staff (CFIR domain: characteristics of individuals) and school meal environment and relationships between stakeholders (CFIR domain: Inner setting). Across these categories, nine barriers and seven facilitators were identified. These categories are further illustrated with quotes from the interviews (Additional file 1).

### *Characteristics of students and kitchen staff*

An interest in the idea of changing school meals to make them more sustainable was consistent among both students and kitchen staff. They stated that they would like school meals to become more sustainable. Other facilitators were that students perceived that they had the power to influence the menu and staff experienced that they had the knowledge and resources to adjust to sustainable school meals, while also considering the students' needs and preferences. However, barriers were that students

expressed that they often just eat what is served without making active food choices both at home and at school. The students emphasized that they do not eat food that is unfamiliar or that they do not like, and they are thus skeptical toward change. Further barriers included students' preconceptions that school meals are not enjoyable, they do not base their food choices on climate impact as they tend not to involve themselves in environmental issues, and that there is lack of knowledge among students about vegetarian food and plant-based protein which contributes to their disinterest in eating it. Students expressed a desire for an improved overall quality of school meals, but they also emphasized that they would tolerate only minimal changes to the food's look and taste for them to accept more plant-based meals.

### ***School meal environment and relationships between stakeholders***

Facilitators within this category included a positive and supportive work environment for kitchen staff, a shared perception of respect and good communication between students and kitchen staff, and support within the kitchen staff for current initiatives to improve sustainability of school meals. Barriers covered kitchen staff's perception of difficulties in getting high school students to accept a change towards more plant-based meals. Among students, stigma about vegetarian food and peer pressure is a barrier to choose vegan and vegetarian alternatives at school.

## **Discussion**

This study is one of the first to study the barriers and facilitators to implementing sustainable school meals in the high school setting in a high-income country. The barriers and facilitators mapped onto two of the five domains of the CFIR: characteristics of individuals and inner setting. Barriers included a low desirability toward vegetarian meals as well as lack of knowledge on the nutritional value of plant-based proteins among students. The meal staff was less inclined to prepare more plant-based meals because they were perceived as less acceptable among students. Facilitators included a common interest in change towards sustainable meals and a good relationship between students and meal staff. Also, kitchen staff perceived that they have the knowledge and resources necessary to implement change.

### **Importance of participant attitudes for implementation**

Understanding behaviors and reasoning of young people, and why they engage in the dietary practices that they do, is essential to achieving major dietary change (22). Among young people, health behaviors are defined by identity, as the diets and physical activity of young adults are formed by their beliefs and attitudes (23).

Further, food choices have a significant role in the development of young people's self-image and how they conform to desired peer norms. Findings from a 2012 study in the UK suggest young people's shaping of their self-image and fitting in are impacted by views on healthy eating. Among young people, an interest in healthy eating was considered to be socially and emotionally risky (24). Therefore, the study concluded that interventions must target the emotional needs of young people related to identity in

addition to making healthier food choices more available (24). Qualitative research presents a strong potential to deepen this relatively new area of sustainable eating and improve school-based food interventions accordingly (25).

Qualitative findings from the previous OPTIMAT intervention study in younger primary school supported that student and kitchen staff attitudes influence the success of the implementation of new diets (16). Because the students would ultimately be the receivers of the intervention, their views on the proposed changes are crucial to incorporate to make appropriate adaptations. The idea of changing the school meals received positive feedback from the participants, however when it comes to making a change in practice a less positive response was obtained. From the students, there was hesitation around eating more or solely vegetarian food, as they held scepticism that they would receive enough protein if animal products were not served and because they preferred the taste of meat. These findings that vegetarian foods as less desirable are in line previous research including adults from Australian and Danish studies where consumers expressed an inferior taste of plant-based foods compared to non-vegetarian food (26,27). A barrier identified in the OPTIMAT intervention study was that primary school students also held this view that vegetarian meals are less desirable (16).

Thus, regardless of the kitchen staff's desire and ability to implement changes to make school meals more sustainable, they felt that they could not make changes that students would not accept. This indicates that meal staff need stronger signals from decision makers and training to start this process of change. Several municipalities in Sweden have already set goals to reduce the climate impact of their activities in the decades to come, and started to reduce the climate impact from public meals e.g. Lund municipality (28). Students in turn expressed that the food's look and taste are essential factors when choosing their food. This finding is reflective of existing research on barriers to the acceptance of school foods among children such as too little availability and variety of desirable food items and less appealing aesthetics of certain meals (29) .

Other school-based nutrition programs have recognized that school-based initiatives can help to influence adolescents' diets. Thus, a co-creation approach in which context-specific stakeholders are involved is key to successfully design the implementation of an intervention in complex settings like schools (30).

### **Strengths and limitations of this study**

To the best of our knowledge, this is one of the first qualitative studies to explore implementation barriers and facilitators of sustainable school meals in a Swedish high school setting. The study employed a qualitative approach that allowed for an exploration of the experiences and perceptions of both intervention providers (kitchen staff and municipality worker) and its recipients (students), thus contributing to the study's credibility (31).

A main limitation in this study is that data was collected from only one high school. Though patterns emerged from the interviews, having few participants from only one school limits the study's transferability to draw conclusions on a larger scale (32). For these findings to be relevant on a regional

or national scale, further research with a larger number of participants across more contexts would be needed. On the other hand, several of the determinants that emerged align with findings from research of others on the same topic (16, 25-27).

The sampling method used in this study is another limitation. It was planned to sample participants purposively but due to the ongoing covid-19 pandemic, selection of participants had to be done through convenience sampling in the school's cafe in agreement with the principal. Thus, the sample may not have been representative of all students at the high school. It is therefore possible that those who agreed to participate in the study through convenience sampling maintained a greater interest in food and sustainability than the general sample population. However, our findings did reveal some level of heterogeneity, indicating that this study covered a broader range of attitudes and perceptions.

Quality criteria for trustworthiness of qualitative research were used for this study. The criteria consider credibility, transferability, dependability, and confirmability (32). Credibility was reached by allowing the interview guide to ensure all important domains were covered during the interviews and that sufficient information was collected. The use of an inductive combined with deductive content mapping onto CFIR domains contributed to the dependability and confirmability of this study, which guided data collection and analysis to remain consistent and neutral. Moreover, the use of CFIR allows for comparability with other studies and the ability to inform implementations of sustainable school meal interventions on a larger scale.

## Conclusions

Interventions for public sector meals have potential to exert a fostering effect and to improve food systems sustainability. Students and kitchen staff highlighted the importance of familiarity of the food to be appealing. This underlines the challenges when trying to introduce a change towards more plant-based meals in the school setting. It suggests that signals from the policy level outside of the school environment will also be required to achieve the desired change.

Co-creation with consumers and providers should be used to reach high acceptance of the new meals and minimize food waste. Suggested next steps are to expand upon this research with further qualitative studies and surveys that explore the perceptions of students and school staff in other countries and contexts. Interventions for public sector meals can significantly improve food sustainability, yet stakeholders (consumers and providers) should be included in their design.

## List Of Abbreviations

<b>CFIR</b>	Consolidated Framework of Implementation Research
<b>GHGE</b>	Greenhouse gas emissions
<b>CMU</b>	Condensed meaning units

# Declarations

## Ethics approval and consent to participate

The ethical approval of the OPTIMAT project (No 2019-01281) was amended to allow for interviews with high school students (No 2021-00104). Prior to conducting the interviews, all participants were provided with information about the project, and their signed informed consent was required to partake in the interviews.

## Consent for publication

Not applicable

## Availability of data and materials

Not applicable

## Competing interests

"The authors declare that they have no competing interests"

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## Authors' contributions

CM designed collection of, conducted and analyzed interview data regarding student and kitchen staff perspectives on sustainable school meals and drafted the manuscript. PEC and LSE made substantial contributions to the conception and design of the work, interpretation of data and writing of the manuscript. SA provided expertise in data analysis and writing of the manuscript.

All authors read and approved the final manuscript.

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