

Food for thought: A scan of rural school food environments

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Background

Adequate nutrition is an essential support for student performance with research demonstrating a strong correlation between adequate nutrition and improvements in academic performance (1–4). Canada’s Food Guide recommends that children between the ages of 9-13 consume at least 6 fruits or vegetables a day and teens between 14-18 years old aim for at least 7-8 servings of fruits and vegetables per day (5). According to the 2016 Canadian Community Health Survey, an annual cross-sectional survey that gathers information relating to the health status and behaviours of the Canadian population, around 30% of Canadians aged 12 and up reported consuming fruits and vegetables five or more times per day (6). However, fruit and vegetable consumption differed between members of the population based on highest level of education attained and household income. Having one household member with a post-secondary degree was correlated with having higher levels of fruit and vegetable consumption (6).

Students attending elementary and high schools spend around 7 hours each day in school and consume about one-third of their week’s calories in that environment (7). Given this exposure, supportive school food environments (SSFE) are highly influential in the development and maintenance of healthy habits. Therefore, exploring the link between the school food environment (SFE) and health is essential as it can offer stakeholders a glimpse into potential influences in the increasing trend in childhood obesity.

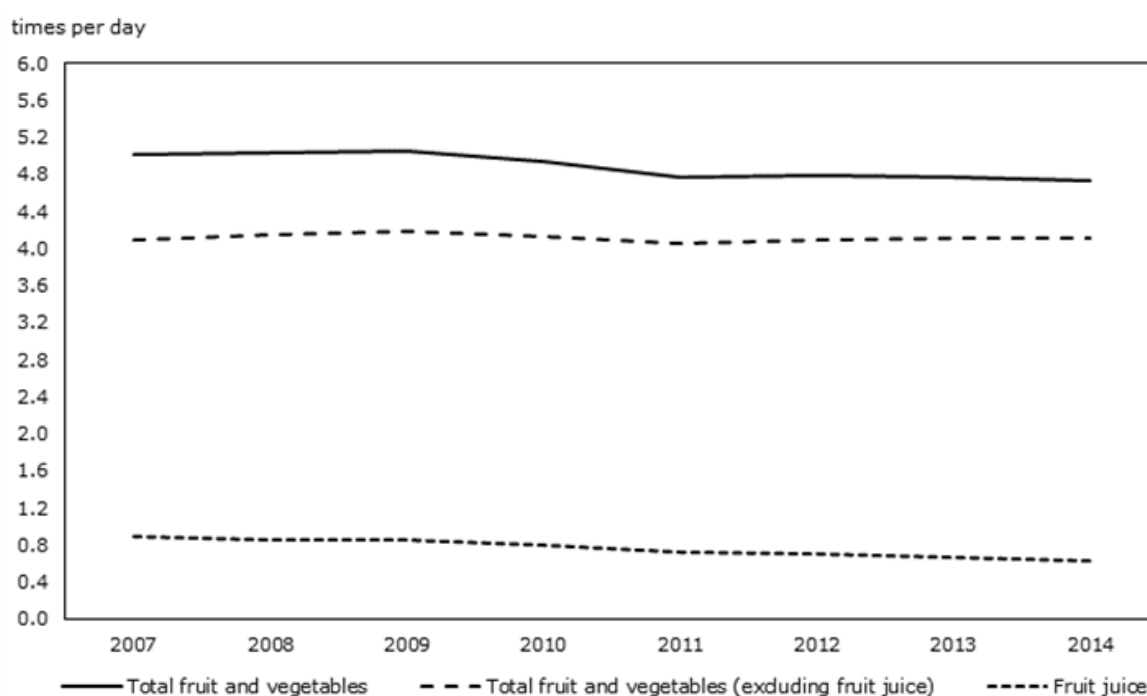


Figure 1. Average frequency of fruit and vegetable consumption, by food grouping, household population 12 and older, Canada, 2007 to 2014 (8).

- This Figure illustrates a small but significant decline in the fruit and vegetable consumption (including fruit juice) in the population. On average, males frequently consumed lower amounts of fruits and vegetables in comparison to females in both years (8).
- Most Canadians are not meeting their vegetable and fruit needs (6, 8, 9, 10, 11). “Approximately 1 in 5 Canadians consumed at least 1 daily serving of dark green vegetables, and 9% consumed 1 or more daily servings of orange vegetables or their substitutes. Juice was a substantial contributor to FV intake, particularly for children and teens who, on average, consumed 32%–41% of their daily FV servings as juice.” (10)

Objectives

The main objective of this study was to identify and assess the facilitators and barriers to a healthy food environment in Grey County and Bruce County schools. Specific research questions that guided the research include “How are schools in Grey Bruce currently supporting healthy food environments in the school and classrooms? Are there examples of innovative or best practice approaches that support a healthy food environment? How are classroom, cafeteria, and school activities using food to support learning?”

Methodology

A mixed-methods approach was undertaken in this study, 14 semi-structured interviews were conducted (n=18) to obtain the perspective of key informants like principals, faculty, and volunteers/parents at schools in the Bruce-Grey Catholic District School Board and Conseil Scolaire Catholique Providence. Researchers developed an interview guide to support consistent data collection. Interviews were voice recorded and two researchers supported each interview to allow for additional written notes. Following each interview, researchers completed an environmental scan (*See Appendix A*) using a tool adapted from Alberta Health Science’s *Healthy Eating Rubric* and Nutrition Tools for Schools’ *Creating a Healthy School Nutrition Environment*. We assessed the SFE including eating spaces, student access to water, and the types and portion sizes of food choices available in the schools. Research ethics review and approval for this study was obtained through the Grey Bruce Health Unit’s (GBHU) internal Research Evaluation and Evidence Informed Practice Advisory Committee. An iterative approach and thematic content analysis was used to identify and categorize emergent themes in the collected data. (12)

Environmental Scan:

The environmental scan was based on a subjective, observational assessment of the school environment. The researchers observed hallways, gyms, and other areas accessible to the public. Excluding classrooms from this scan may have excluded important nutrition messaging. The scan explored the availability of a designated eating area, microwave access, adult supervision during meal times at the elementary level, the nutritional quality and quantity of food sold in the cafeteria, water accessibility, presence of health-promoting materials, the student nutrition program, food and beverages found in vending machines, fundraising activities, special-event days, and any collaborative projects such as Fresh from the Farm. The scan also noted whether the school had a kitchen for the nutrition programs, and the structure of school breaks.

A rating system between 0-4 was used to score each category. Items scored with a zero indicated “Not applicable” or “Not available” for instance such as having no microwave access. Items with a score of four indicated having more positive school supports. The results from each category were assessed individually and schools were not compared to one another.

Results

Schools and the Food Environment

Supports for a healthy food environment

All participants considered their school’s food environment to be healthy or fairly healthy although some recognized room for improvement. Specific factors perceived to contribute to a healthy food environment included compliance with the School Food and Beverage Policy (PPM 150), participation in the Ontario Student Nutrition Program (OSNP), engagement of caregivers & parent council, availability of a milk program, and staff modeling healthy eating behaviours (Table 1).

Supports for a healthy food environment	Perceived Barriers
<ul style="list-style-type: none">• Compliance with the School Food and Beverage Policy (PPM 150)• Ontario Student Nutrition Program (OSNP)• Parents/Parent’s Council• Availability of a milk program• Staff modeling healthy eating behaviour	<ul style="list-style-type: none">• Food sent from home• Healthy fundraising• Accessibility of healthy food choices• Insufficient resources• Allergy Awareness• Lack of policy implementation• 8% of schools reported experiencing no challenges

Table 1. Summary of the perceived supports and barriers to a SFE according to the participants.

The School Food and Beverage Policy (PPM 150)

Ontario’s PPM 150 regulates the types of foods and beverages that can be sold in schools. The guidelines classify foods into three categories: ‘healthy food’ which should be sold 80% of the time, ‘less healthy food’ which should be sold less than 20% of the time, and ‘not permitted for sale’ foods which should not be sold in schools (13). The policy permits up to 10 “special-event” days when foods and beverages non-compliant with the policy can be sold (13). Participant responses indicated that schools either reserved the 10 “special-event” days for holiday dinners such as Christmas and Easter or for other special events such as spring celebrations or start-of-school barbeques. No school reported using more than 10 special event days. Participants felt that the policy on “special-event” days is poorly articulated, creating confusion, and that more guidance is needed on qualification criteria.

When asked about what facilitated the implementation of nutrition policies in schools, some participants could not provide a response to the introduction of PPM 150 as they had not been in their present role during the initial implementation. Those that could provide a response noted interactive administrator sessions were more effective than independent review of the guidelines. Others mentioned that policy implementation led to reflection on current practices. Policy implementation started discussions with parent council and the board, and gave schools a common understanding of strategies needed to improve their school environment. One participant noted that greater student engagement with a transitional approach to policy implementation may have improved student reception to PPM 150 changes.

Ontario Student Nutrition Program (OSNP)



Now known as Student Nutrition Ontario (SNO), respondents commonly cited the Ontario Student Nutrition Program as a major feature within their school's food environment. All schools in Grey County and Bruce County participate in the OSNP, however schools use different models (ie. breakfast, snack, or lunch, or any combination of the three) based on the school's needs and resources (14). The program relies not only on staff but also on caregivers and other volunteers who assist with planning, shopping, food preparation, and distribution of meals and snacks.

All participants felt that the OSNP significantly contributed to a supportive food environment in their school. Some participants noted that the food offered may not be appropriate for all dietary needs, often few vegan or vegetarian options are available. Having access to nutritious snacks is perceived to be especially important for vulnerable students including those who live in rural settings that require long bus commutes or those who experience food insecurity. These students may skip meals or snacks, impacting their behaviour and academic performance (15).

There was a significant demand expressed for the OSNP in all participating schools. All participants informally track the number of students who access their OSNP. One school served an estimated 430 snacks per day, another offered between 1,000-1,500 meals per month. Parental and student involvement in OSNP varied across schools however, participants described a consistent need for more volunteers and supports.

Respondents positively described the universal delivery of the OSNP for reducing stigma associated with the breakfast program. Additionally, OSNP was seen as a positive social opportunity for students. Participants also noted that OSNP supports role modeling of healthy eating behaviours. It is apparent that the Grey Bruce OSNP coordinator has been instrumental in program sustainability and is a trusted source for information and support.

Caregivers and Parent Council

Principals and faculty in elementary schools recognized the contributions of caregiver volunteers to SSFEs. Caregivers are engaged in programming, fundraising efforts, special-events, and contributing to school

newsletters. One participant noted caregiver support declines in the secondary school setting. This presents a challenge for in engaging parents and in gaining volunteer support for health promotion activities.

Milk program

Having a school milk program was identified as the second most prevalent factor for a SSFE. These programs provide traditional milk choices, but may not offer milk alternatives like fortified soy beverages. Despite wishing to reduce the amount of sugar consumed by students, principals were reluctant to eliminate chocolate milk from the program. Given current sale patterns that favour chocolate milk, principals were concerned that the loss of chocolate milk may lead to a decrease in milk consumption and sales. Research regarding the effects of eliminating chocolate milk on overall milk purchases is limited. In a 2014 pilot study, removing chocolate milk resulted in an overall decrease in milk consumption and slight increase in white milk consumption and waste (16,17). However, despite the overall decrease in milk consumption, on average students were meeting the recommended 3-4 servings of milk and alternatives per day as outlined in Canada’s Food Guide for the 9-13 year old age group (17).

Staff modeling

Participants felt that staff are role modeling positive health behaviours for students through both action and dialogue. Positive behaviours included consuming healthy food choices around students and engaging students in discussions about healthy food choices. Staff reported that they limit minimally nutritious snacks in the staff room. One participant noted that snacks shared among staff were more nutritious than in the past. In some schools, faculty shared weekly or monthly homemade lunches such as soups and chili.

Access to snacks & water

Students generally have access to a snack or water as needed (see Table 1). Secondary students are permitted to bring water bottles and snacks to class however some restrictions apply. Only one school surveyed did not allow food in the classroom. Some schools used OSNP resources to supply snack bins filled

Results indicate:	Average rating for schools
Water Access	4
OSNP	3.5
Fundraising Activities	3.1
Beverage Vending Machine*	3
Collaborative Projects	2
Adequate nutrition supports	1.6
Food Vending Machine*	1.5

*Schools at the primary level did not have vending machines

with **Table 2.** Results of the Grey Bruce Environmental Scan ratings of food environment features

healthy snacks in classrooms and in the administration office. Participants felt that these bins held value for student wellness and reported improved student behaviour after implementation.

Perceived barriers to a supportive school food environment

When exploring barriers to a SSFE, it is essential to consider each school’s unique features. Six categories of perceived barriers were identified: food sent from home; fundraising; accessibility of healthy food choices; insufficient resources; allergy awareness; and lack of policy implementation or evaluation. Interestingly, 8% of schools mentioned not experiencing any challenges with promoting a SSFE.

Food sent from home

Fifty percent of participating schools mentioned that food sent from home is the most significant barrier to fostering a SSFE. Both board and provincial school policies do not apply to foods brought into schools from home. Staff find it challenging to maintain a SSFE without being able to control these foods. Participants noted that most treats come in lunches around the holidays or special events such as Halloween, Christmas, and Valentine’s Day. Foods from home also presented challenges for allergy management. Some participants noted the social pressures of packed lunches resulting in students bringing in highly processed snacks and take out fast food.

In general, teachers are discouraged from sending a note home to parents commenting on lunch quality, though there is no formal policy. Instead, teachers and other faculty tried to stay aware of food choices offered in a student’s lunch and would typically express any concerns through phone discussion with caregivers. The participants did not believe that any further policies were needed.

Healthy Fundraising

Participants felt that having a SSFE would not interfere with fundraising goals. However, a common theme that emerged in interviews was that it was challenging to identify healthy food options that would be

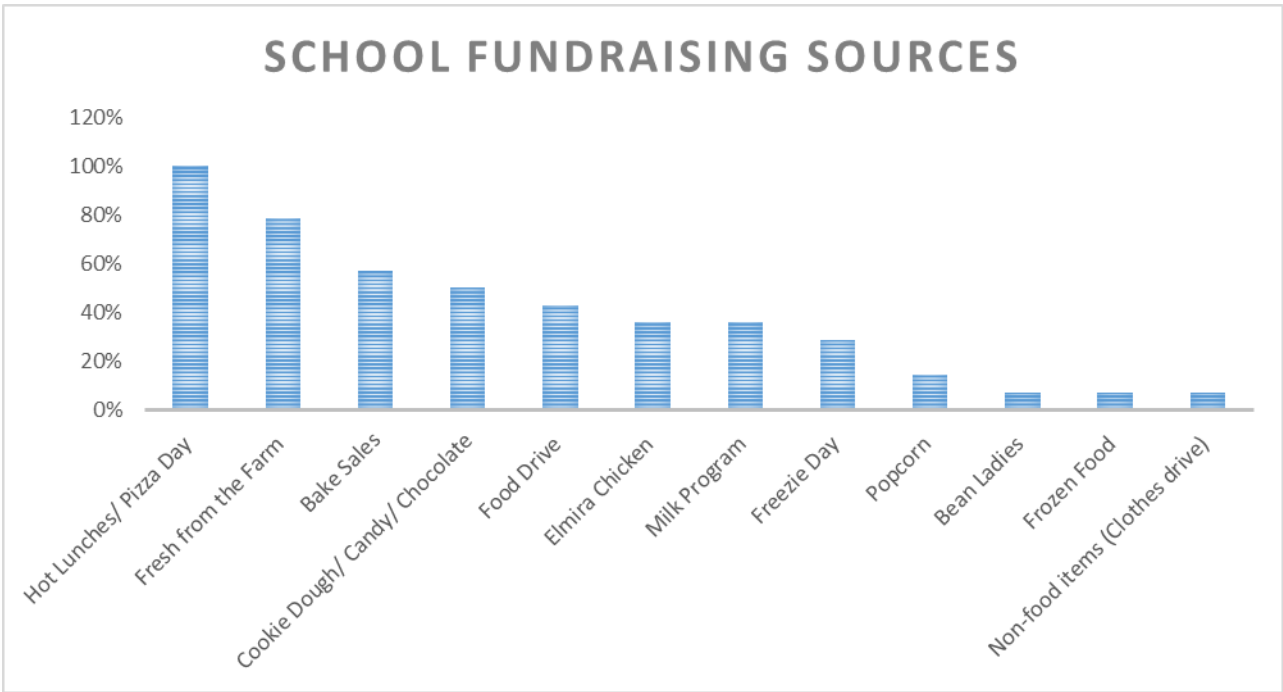


Figure 2. Sources of revenue for school fundraisers

profitable and popular in their school. All schools used food in fundraising efforts, the majority being foods with low nutritional value. A report titled “Getting Started with Healthy Eating in Recreation Settings” published by the Ontario Society of Nutrition Professionals in Public Health (OSNPPH) indicates there is a common misconception that the sales of healthy foods will not be as profitable as unhealthy foods (18). Caregiver and volunteer recruitment was another challenge to fundraising efforts, especially in rural settings. Figure 4 illustrates the types of fundraisers report by schools. Food-based fundraising efforts were reported by all schools with a variety of food types sold.

All schools reported the use of weekly or bi-weekly hot lunch sales. The most common foods offered through these fundraisers included: pizzas, pitas, and soups. The second most popular form of fundraising was the *Fresh from the Farm* program that provides schools the opportunity to sell Ontario-grown produce (19). Eighty percent of schools participated in *Fresh from the Farm*, and reported success and satisfaction with the program. However, some schools chose to alternate participation with other schools. Some schools reported experiencing delivery issues in the past, demonstrating the challenge of distributing fresh produce. Only two schools reported fundraising with non-food items such as hosting a clothing drive or magazine sales.

Accessibility of healthy food choices

The need for continued support of the OSNP in schools was a consistent theme that emerged across interviews. Participants mentioned that adequate funding was necessary to keep the program running, particularly to cover the cost of healthy food. This was especially the case for participants at the secondary level, who felt that the most significant barrier to fostering a SSFE included the price point and limited choices of healthy foods offered in vending machines and the cafeteria. Nine of ten elementary schools assigned classrooms as designated eating areas for students to consume their meals. On the other hand, high school students had cafeterias as designated eating areas.

In one high school, participants noted that unhealthy foods held greater price value than healthy foods. Results from the environmental scan in this school indicated that fruit cups and sandwiches were sold for \$4.50 each, pitas or wraps for \$6.00, while a combination meal of a burger, fries, and a carbonated beverage sold for \$5. The scan also indicated examples of healthy food options offered including granola bars, fruit snacks, and breakfast bars, which were valued at the same price as minimally nutritious food such as brownies. Participants felt that the limited food options offered in their cafeteria led high school students to purchase their meals and snacks from nearby fast food establishments.

Available Resources

Another common barrier that participants noted was poor access to promotional materials for nutrition topics. Limited resources were perceived as a greater barrier for French educators. In addition, participants stated that due to the demanding nature of their jobs there was not enough time to search for and display materials. Therefore having quick access to reliable resources was a priority for participants.

Allergy awareness

In 2005, the Ontario government implemented Sabrina's Law which mandates every school board in the province to maintain an anaphylaxis policy and regular training for staff. It requires schools to create individual plans for each student at risk of anaphylaxis (20). In this study, participating schools used a variety of allergy management strategies. Food restrictions are not consistently used. Some schools implemented a strict nut-free policy, others had a nut-aware policy, and some schools did not implement restrictions on any food. A common theme that emerged is the need for allergy awareness in the students and parents. Participants also identified the following barriers: creating safe spaces for meals and snacks; monitoring food from outside sources; finding allergen-free recipes for fundraising; and poor community reception to policies. Participants stated that parents often struggle to find convenient and inexpensive alternatives to allergen containing foods such as peanut butter.

Policy implementation and evaluation

Principals demonstrated an interest in more guidance and support on evaluation strategies. At the beginning of each school year, the Grey Bruce Health Unit sends principals an electronic copy of the *Healthy Schools Toolkit* (21). However, participants mentioned that they receive an overwhelming number of emails, particularly in September. As one participant stated, educators are limited in their time, therefore having professional development opportunities to discuss specific topics would be beneficial.

Participants felt that additional policies were not needed to improve the school food environment. Instead they recommended greater efforts be made to ensure that the existing nutrition policies are properly implemented. For example, a participant voiced concerns regarding the size of cookies sold, and the limited healthy food options available in the cafeteria. The participant identified a need for evaluation practices to ensure compliance with PPM 150.



Curriculum and Resources:

Nutrition Education

Nutrition concepts are included in the Ontario Health and Physical Education Curriculum (PHEC) which all publically funded schools are required to follow (22). Though no specialized training is required to teach nutrition concepts, participating secondary schools had staff with specialized training in culinary arts or nutrition. Seventy-one percent of participants felt that teachers are given the tools, training, and resources necessary to effectively teach food and nutrition concepts. Twenty-one percent of participants felt that resources were available however, they felt that some improvements were necessary. Participants identified a need for updated resources and novel ways to teach nutrition. The remaining 8% felt that there was a lack of appropriate training or resources.

All participants referenced the Ontario Public Health and Education Association (OPHEA) resources (23) as an important curriculum support for nutrition topics. Additionally, all schools reported inviting guest speakers to present on food topics. Participants mentioned Dairy Farmers of Ontario representatives offered staff free workshops, resources, and lesson plans. Unfortunately, in January 2018 the Dairy Farmers discontinued the Ontario Teach Nutrition program and limited print resources available for order (24). Educators consulted with the OSNP coordinator for resource recommendations as well as using google.



Use of food in the classroom

Food as a Teaching Tool

Participants described a variety of uses for food in the classroom (see Figure 3). The most common theme was the use of chocolate bars, candies, apples, and cereal to teach fractions, word problems and graphing concepts. One participant noted that “Smarties™ are easy to sort and this is how it has always been, kids expect it.” These treats are often purchased by the teacher, which may influence the food choices offered. Another participant noted that educators use cooperative activities like making gingerbread houses “to teach healthy eating tips like eating candy in moderation.” Food is also used to teach anatomy and social skills.

In secondary schools, food was used for cross-curricular planning with life skills courses. In one business class, students discussed the influence of the food industry and the media on consumer choices. Food was discussed in terms of fuelling the body in physical education classes and students were introduced to foods from different countries and religions in cultural classes. Additionally, secondary school students have the option of enrolling in hospitalities electives where students create and modify recipes, practice culinary skills, and discuss food science. In some health classes, students use food journals as self-reflection activity.

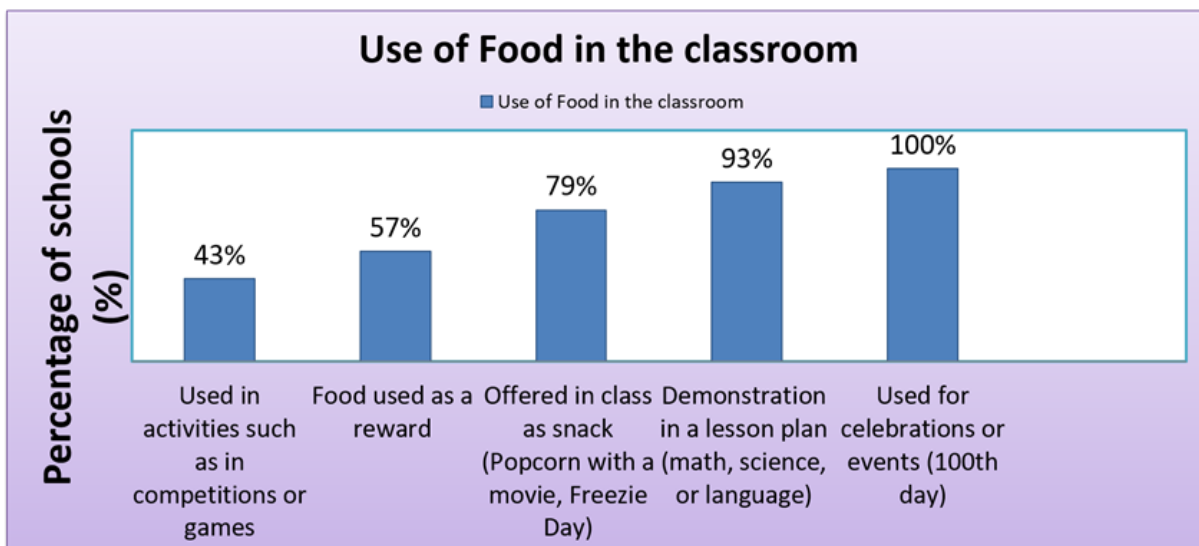


Figure 3. Describes the frequency and methods in which food was used in the classroom.

Food as a Reward

Fifty-seven percent of schools reported that food is used as a reward in the classroom (see Figure 3), however most did not feel it was used regularly. One participant stated that students were rewarded indirectly when the school offered to host a pizza party for the winning class participating in challenges such as the Thanksgiving Food Drive. Additionally, some participants stated that teachers used behavioural modification techniques such as Applied Behavioural Analysis with students with special needs. A majority of participants stated that teachers use candy for positive reinforcement in students who displayed behavioural issues.

In the Classroom

Seventy-nine percent of participants reported that food was offered infrequently as a snack in the classroom (see Figure 3). Participants indicated that the use of snacks was reserved for special occasions such as holidays or “special-event” days. One participant offered that some classrooms offered more snacks than others depending on the teacher. Interestingly, one school allowed parents to opt out of the classroom snacks provision for their child. Occasionally, some teachers kept bowls of candy on their desks and students handed pieces of candy to their peers during in-class presentations.

Celebrations or Events

All schools offer food during celebrations and events. At the secondary level, food such as pop, chips, and popcorn were offered during graduation ceremonies, dances, and as holiday food-grams to be sent to their peers. Overall participants stated that celebrations were infrequent and complied with the 10 special-event days. Elementary schools often celebrate the 100th day of school by serving special meals and foods used for counting.

Competitions or games

Almost half of the participating schools used food competitions or games (See Figure 3). An informal food challenge mentioned by one participant included the “Oreo™ Challenge,” in which students compete to balance an Oreo™ cookie on their forehead as long as possible. Participants described the use of candy such as Smarties™ during icebreakers and other social events

Peer Leadership Opportunities

The two most common peer leadership opportunities described were student-led fundraising activities selling milk or pizza. Student councils were often involved with these initiatives. Students also had the opportunity to participate in other fundraising events such as “Me to We” soup days, however no peer education was offered in these instances. One participant felt that externally funded peer leadership opportunities were limited in elementary schools. At the secondary level, participants recommended programs like DECA to promote leadership. DECA links of high school and university students with business advisors. Members “compete in a range of competitive events on topics spanning from Business Management, Entrepreneurship to Hospitality and Tourism” (25). All participants expressed success with “The Great Big Crunch,” an OSNP initiative encouraging schools and students to celebrate healthy eating by participating in a “synchronized” bite of locally grown apples (26). Participants demonstrated a keen interest in exploring further opportunities for peer leadership related to supportive food environments.

Indigenous Supports and Messaging

Indigenous supports and messaging for cultural awareness and sensitivity varied between schools. Most schools incorporated an Indigenous phrase of the day and a territorial acknowledgement. Some participants mentioned having designated spaces, prayer services and resources available when asked about whether their school incorporated information about Indigenous culture in the school. A majority of participants felt that their school environment contained some messaging related to Indigenous cultures but there was room for improvement. As one participant stated, most schools are in the “awareness stage.” Learning about Indigenous culture is a part of the school-learning plan for staff, students, and the community. However, including more culturally inclusive messages was felt to be a challenge in some schools given the limited number of students identified as Indigenous.

One school had a dedicated staff member with the title, “Cultural Animator” who was responsible for creating illustrations representing different cultures in the school. Results from the environmental scan of this school indicated that many cultural supports existed for Indigenous students. Specific examples include: A featured sign with phrases of “welcome” in different languages at the school entrance, and an outdoor display featuring the Medicine Wheel in the playground.

Two schools created displays out of respect for the Missing and Murdered Indigenous Women. These displays featured faceless dolls personalized by the students. One school also had a beaded belt onto which a new bead was added for each new student enrolled in the school. Other initiatives undertaken at the school included having a “history and heritage day” with workshops demonstrating fish filleting and beading.

Some secondary school classes engage students in hands-on activities that explore culture through food. A participant from this school mentioned that an Indigenous culture was not always selected as a culture of choice, however foods from other cultures such as Vietnamese, Chinese, Italian, Indian, Greek, and Mexican were common. Another school had a unique initiative called “The Little Eagles.” This group of students met with the Indigenous coordinator at the school board once every two weeks to hold discussions and share traditional and non-traditional food.

Current projects and practices

Snack Bin program

This program is used by schools to promote healthy eating. Students have all-day access to bins of fruits and other snacks to fuel up throughout the day. In one school, a dedicated group of male students is chosen to refill the bins. This group, chosen by a male Educational Assistant, supports the sorting and distribution of snacks to the rest of their schoolmates. This provides a positive male role model and an opportunity to practice social skills.

Backpack program

In one school, students identified as experiencing food insecurity are given backpacks by the breakfast club organizer at the beginning of the school year. Students drop off their empty backpack in the office to be filled with extra food from the program. Students take the backpacks home on the weekend, discretely redirecting food to where it's most needed. The principal reports this program has been running successfully for two years.

Cooking Club

At one school, two teachers and one parent volunteer provide instruction and supervision for a free cooking club that takes place twice a week during lunch and recess. Approximately 64 students participate from grades 4 to 8. Local grocery stores and companies donate monthly to the program. The prepared food items are either donated to the school bake sale or a local retirement home. Simple healthy recipes and ideas are explored, and students learn important food literacy skills, such as knife safety and safe food handling practices. As students are exposed to a variety of new foods they develop a cookbook incorporating their favourite recipes.



Facilitators for a Supportive School Food Environment

Participants identified five factors needed to foster a SSFE (see table 3). Increased support for these five factors would promote healthy eating, increase food literacy and make healthy food choices more affordable and accessible.

Resources for Caregivers/ Parents	Educational resources to increase awareness among caregivers on packing healthier lunches
Resources for Schools	Promotional items to increase awareness of healthy eating and bilingual nutrition education resources
Financial Support	Maintain or increase funding support for the OSNP
Fundraising Support	Healthy fundraising ideas and supports
Collaboration	Engaging caregivers and community members to establish and support a healthy school committee.

Table 3. Facilitators for a Supportive School Food Environment

Community Partnerships

An area for future development may include the expansion of food systems partnerships to supply local, healthier food options for schools. Some schools have established partnerships with community restaurants or organizations to regularly supply hot meals. In addition, participants stated that they attended events showcasing local agri-food, including: “The Water Festival,” “Roots of Bruce,” “Forest Festival,” and trips to local producers.

Technology

Participants expressed interest in incorporating more technology-based initiatives to promote healthy school food environments such as Bright Bites (27). Bright Bites is an online interactive program, developed by ODPH that encourages schools to obtain badges by completing fun and exciting food challenges (27). Others identified that using social media to target caregivers could be an effective nutrition education tool.

Healthy School Champion

Some participants felt that selecting a “Healthy School Champion” or a “Healthy School Committee” to advocate for a SSFE would be beneficial. A designated champion with resources and motivation would have a significant impact. The champion or committee could complete a needs assessment to identify current needs, knowledge gaps, and interests to tailor interventions. Additionally, one participant emphasized the importance of having formal workshops in their schools to raise awareness of barriers to a SSFE. Finally, participants felt that it is important to provide caregivers and parent councils with educational resources. As one participant stated, “We all know [how to eat healthy] but may need a refresher for packing lunches for example.” Therefore, providing caregivers and educators with easily accessible food literacy information and resources will help to build a more SSFE.

Discussion

All schools involved in this research project provided valuable perspectives on the contributing factors to a supportive school food environment. The prevalence of student nutrition program, caregiver engagement, and food charity within these discussion led the researchers to elaborate on these topics with short literature summaries as follows.

Student Nutrition Programs

The OSNP was the most universally recognized support in the school food environment through this project. Therefore, it is important to explore the long-term sustainability of this program. In this study, participants expressed a desire for universal access to nutritious snacks and meals for the students. “Having a lunch program would be amazing” one participant stated, “It would be a great potential teaching opportunity [for the students]”. Another participant stated, “snacks [used in the classroom] are coming ‘out of pocket’ and so teachers are going for cheaper options.” Consideration should be given to whether food is the best educational tool and if so, why these foods are not expected to comply with applicable nutrition guidelines. The current practice of using less healthy foods in classrooms undermines the health curriculum content that is being taught in the same classroom. According to a report published by Toronto Public Health titled “Nourishing Young Minds”, an ideal SNP is one that is “integrated into the school environment as a component of a comprehensive school nutrition environment (seen as an integral, seamless component, and not as a separate entity)” (28).

Continued provincial support for student nutrition programs is vital to maintaining the quality and integrity of the program. Currently, Canada is the only G8 country without a national school lunch program (29). According to a 2017 UNICEF report, Canada ranked 37 out of 41 countries when exploring access to nutritious food for children; just below the United States and above Bulgaria (30). Countries such as Finland, Brazil and Japan have implemented food programs and policies that support food literacy and may show merit if adapted to the Canadian context. In Finland's national food school program, children are provided a balanced, healthy meal while a supervisor teaches them about nutrition and healthy eating while school food programs in Brazil are mandated to acquire 30% of their school's food purchases from local farmers (30). Interestingly in Japan, students at the elementary level not only learn how to cook but also take turns serving lunch in the cafeteria to their classmates and teachers. Additionally, both boys and girls in grades 5-12 are required to take Home Economics as a required course rather than being an elective (31). Federal support of student nutrition programs should be advocated for by stakeholders at all levels.

Caregiver Engagement

Effective communication and support between parents and staff is integral for fostering a supportive food environment both in school and at home. Lack of communication between staff, schools, and parents may lead to resistance when implementing changes to existing policies and procedures. For example, participants mentioned experiencing opposition to the school's decision to ban chocolate milk or reduce the number of hot lunch days. This could be explained by MacLellan et. al (1) in which she explains, "parents may look forward to hot dog days as time is a barrier for parents and so having the option of buying a lunch seems more convenient which is line with the misconception some have about healthy foods being more expensive."

Time: The perception that time is a barrier to packing healthy lunches and snacks by some caregivers,
Cost: A misconception that healthy foods are more expensive
Education: Lack of awareness exists amongst caregivers regarding what foods were considered healthy

Table 4. Perceived Barriers to Healthier Food Choices from Home (According to the "Call to Action: Creating a Healthy School Nutrition Environment" report published by the Ontario Society of Nutrition in Public Health) (32)

1. Inadequate communication with parents and students about policy and menu changes
2. Limited school resources and volunteers
3. Role responsibility conflict concerning the feeding of children
4. Student food preferences

Table 5. The perspectives of caregivers and students on barriers to a SSFE (1)

Food Charity

In Canada, one in six children under the age of 18 is living in a food insecure household (33). Families living in poverty need improved financial stability. Research suggests a strong correlation between students who experienced food insecurity and demonstrate difficulty concentrating, memory recall, and behavioural issues (33). Many of the schools involved in this project have undertaken food drives or similar food charity responses to the incidences of hunger observed in their school body. However, research shows that these food-based solutions are ineffective at addressing the root cause of food insecurity, which is poverty (33, 34). In fact, evidence indicates that as food charity has grown in our communities, more effective government responses have been withdrawn (34). This demonstrates that a reliance on food charity may have worsened the situation for food insecure households. An income response is needed to impact food insecurity in our communities (33, 34). When holding food drives and similar events, schools can concurrently raise awareness on what is needed for a sustainable solution.

This does not mean that community gardens, kitchens, and emergency food provision are not valuable. Until more effective policies are implemented, these programs will continue to attempt to meet immediate hunger needs. These programs hold greater potential in promoting food literacy, especially when universally delivered. Community gardens and kitchen programs provide opportunities for socializing and building food literacy skills (34).



The Healthy School Framework & Taking Action

The 5 factors for a SSFE presented within this report provide a platform for local action. The Foundations for a Healthy School is a provincial resource designed to help contribute to a learning environment that promotes and supports child and student well-being (see Appendix D) (35). The recommendations from this project, incorporate the 5 factors into this framework, with additional connections made to emerging research on a food literacy framework for health eating (see Appendix E) (36). Table 6 presents these recommendations within the Healthy Schools Framework.

Table 6

Curriculum, Teaching, & Learning	<ul style="list-style-type: none">•Offer staff training on evidence-based nutrition concepts, food literacy, and available resources. Encourage consistent nutrition messaging across all schools. Regularly review nutrition policies and practices and identify opportunities for nutrition promotion within schools.
School & Classroom Leadership	<ul style="list-style-type: none">•Create a dedicated School Health Champion or committee to lead nutrition initiatives. Encourage School Health Champions to connect with public health for support.•Avoid using food as a reward in the classroom.
Student Engagement	<ul style="list-style-type: none">•Ensure each student has the opportunity for meaningful participation in sustainable food security initiatives beyond the charitable food response. Facilitate connections with community food programs (eg. The Good Food Box, community gardens, community kitchens)•Engage students in opportunities for peer leadership in creating supportive school food environments
Social & Physical Environment	<ul style="list-style-type: none">•Ensure that healthy food choices are available and accessible.•Continue to support universal Student Nutrition Programs.•Do not use food as a reward.
Home, School, and Community Partnership	<ul style="list-style-type: none">•Share nutrition information from credible sources with caregivers and families through newsletters and social media.•Increase local food procurement and offer opportunities to experience local food and agriculture
Support for Indigenous inclusion	<ul style="list-style-type: none">•Learn more about Indigenous culture, traditional ceremony and foods.•Connect with members of the local Indigenous community in coordination with partner agencies

Limitations

First, it may not be appropriate to generalize the results from this study to urban Canadian settings. Further research should attempt to replicate these findings in other geographic areas and with other demographics. Secondly, the environmental scan relied on subjective assessments of the school environment. The criteria outlined for each category, however, may have reduced the risk of researcher interpretation bias. Thirdly, the majority of participants were principals and teachers which may have resulted in a social desirability bias (37). As in any retrospective study, there is a possibility of errors resulting from recall issues (37). Further research should explore the perspectives of caregivers and students on the barriers and facilitators to a supportive school food environment.

Conclusions

This environmental scan revealed that all participating schools in Grey Bruce felt they were contributing to a supportive school food environment. The spectrum of activities undertaken by schools ranged from breakfast and snack programs, cooking classes, rewards and challenges, to charitable campaigns, nutrition education, and role modeling. The degree to which these activities were effective in achieving the desired outcome varied between schools. Opportunities remain for redirection, improvement, and expansion of these efforts. Participants identified five key factors influencing their ability to create a SSFE. The recommendations presented in this report provide guidance for all schools in Grey Bruce to integrate the Healthy Schools Framework and Food Literacy Framework into sustainable school initiatives that allow all students to meet their full potential.

Appendix A: Environmental Scan

School: _____

Review Date: _____

Inspected kitchen available: Yes ☐ No ☐

Reviewer: _____

Job Title: _____

School breaks structure	<input type="checkbox"/> Balanced School Day	<input type="checkbox"/> Traditional School Day
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School Eating Environments				
School has an appropriate designated eating area for the students.	No designated eating area/cafeteria present, students eat lunch in <input type="checkbox"/> Gym <input type="checkbox"/> Hallway <input type="checkbox"/> Classroom <input type="checkbox"/> Other _____ No food equipment available for student use e.g. microwaves No adult supervision present while students eat lunch	Designated eating area/cafeteria present, but not welcoming, clean, or spacious for students No food equipment available for student use. e.g. microwave Adult supervision may or may not be available	Designated eating area/cafeteria present, area is clean, spacious and welcoming for students No or insufficient food equipment available for student use. e.g. microwave Adult supervision present while students eat lunch	Designated eating area/cafeteria present Area is spacious and welcoming for students Students have timely access to food equipment. e.g. microwave Adult supervision is present while students eat lunch
Food sold in the cafeteria: Healthy, reasonably priced and culturally appropriate food choices available in the school. <input type="checkbox"/> N/A	Limited food options offered in the cafeteria, food sold does not look appealing, and healthier food options are at least 50 cents more expensive than less healthy options	Some food options to choose from, food is either unappealing or healthier food options are at least 50 cents more expensive than less healthy options	Many food options to choose from, food looks appealing but healthier food options are the same price as or at least 50 cents more expensive than unhealthy options	A variety of healthy and appealing food options which are at least 50 cents less expensive than less healthy options
Student accessibility to water.	No water fountains or water refill stations present in different areas in school	Limited access to water fountains or water refill stations	Most areas have water fountains or water refill stations in accessible locations	All areas have water fountains or water refill stations in accessible locations
Age-appropriate nutrition supports are visibly displayed in common areas.	No posters, pictures or books that promote healthy eating initiatives, activities or guidelines displayed	Some areas have posters, pictures, or books that promote healthy eating initiatives, activities or guidelines displayed	Most areas have posters, pictures or books that promote healthy eating initiatives, activities or guidelines displayed	All areas have posters that promote healthy eating initiatives, activities or guidelines displayed
Student Nutrition Program: <input type="checkbox"/> Breakfast <input type="checkbox"/> Lunch <input type="checkbox"/> Snack <input type="checkbox"/> Combination _____	No student nutrition programs offered in the school	Student nutrition program offered some days throughout the week and barriers to access may exist	Student nutrition program offered daily but some barriers to access exist (i.e. conflict with bus schedule)	Student nutrition program offered daily, fully accessible, does not conflict with another activity

Vending Machine Assessment:

Food:				Comments:
<p><u>Food</u> vending machines present in the facility:</p> <p><input type="checkbox"/> No food vending machine present in the school</p>	<p>Vending machines do not have healthy food options for sale. Food offered provides minimal nutritional value. Examples listed below*.</p>	<p>Some healthy options offered but unhealthy options are the majority of foods offered.</p> <p>Healthy food options are valued at the same price as or 50 cents more expensive than unhealthy food options.</p>	<p>Most food choices sold are nutrient dense snack options. i.e. labelled as having low sodium, low sugar, good source of fiber, minerals or vitamins) Healthy food options are valued at the same price as or 50 cents more expensive than unhealthy food options.</p>	<p>All food choices sold are nutrient dense snack options. i.e. labelled as having low sodium, low sugar, good source of fiber, minerals or vitamins) Healthy food options are valued at the same price as or 50 cents less expensive than unhealthy food options.</p>
Beverages:				
<p><u>Beverage</u> vending machines present in the school:</p> <p><input type="checkbox"/> No beverage vending machine present in the school</p>	<p>No healthy beverages sold in vending machines, only unhealthy beverage choices. Examples listed below. **</p>	<p>Some healthy beverages sold in vending machines but majority of options include beverages with minimum nutritional value</p>	<p>Many healthy beverages sold in vending machines, limited unhealthy beverage options (but healthy food options are at the same price or at least 50 cents more expensive than unhealthy options)</p>	<p>All beverages sold in vending machines are healthy, no unhealthy beverage options offered.</p> <p>Healthy beverages offered are at least 50 cents less expensive than unhealthy food options.</p>

* Healthy food options include fruit cups, crackers, soups, yogurt and granola bar with low sugar and is not the first listed ingredient, and with no sugar substitutes. "Sugars" include fruit puree and fruit juice.

** Healthy beverage options include bottled water, sparkling water, Skim, 1% or 2% white milk or plain fortified soy beverage, and 100 % vegetable and fruit juice (200 mL maximum size for K-8). Unhealthy/ Sometimes options include: Gatorade, iced tea, energy drinks, vitamin water (with zero sugar), and chocolate milk.

Appendix B: Consent Form

What is the purpose of this activity?

- To develop a report that will inform schools, school boards, and other community partners in strengthening food-related practices in Grey Bruce school settings. The report will be shared with all participants, partner organizations, and made available online through the Grey Bruce Health Unit website.



- To better understand the food environment of schools in Bruce and Grey

- To facilitate schools in promoting food environments that are supportive of health and well-being

- To recognize school leadership in creating supportive food environments

- To identify best-practices being implemented in Bruce and Grey schools

What is your role as a participant?

If you agree to participate, you will be asked to sign this consent form. You will be asked to participate in a 1 hour interview. This is an open conversation guided by questions asked by a facilitator. Your permission to record this interview to assist future note taking will be requested. Any written notes will not include real names of participants. Both the notes and written observations will be kept as encrypted files on a password protected internal network server and destroyed within five years. Experiences and quotes may be used in the final report with participant permission.

Confidentiality

As this project aims to highlight local best-practices, it is impossible to provide complete confidentiality or anonymity, school or program names may be referenced in the final report with permission from individual participants and their organization. Names of individual participants will not be used in the report.

To keep your information private, I will:

- not use your name in reports or presentations

- notes and written observations will be stored as encrypted files and password protected

Withdrawal

You may change your mind about being in this activity at any time and are free to end the interview. There will be no negative consequences to you or your organization as a result of withdrawing from this activity.

Name (please print): _____ Date: _____

Signature: _____

Thank you for your participation!

For more information, please contact: Laura Needham, public health dietitian

Email: l.needham@publichealthgreybruce.on.ca, Phone: (519) 376-9420 ext. 1267

Appendix C: Interview Guide

School and Food Environment:

Introduction:

Each day, students spend around 7 hours at school and consume one-third of their calories there (1). A supportive school food environment will assist children in developing healthy eating habits for life. The food environment refers to many aspects of a community including the types of foods available in a cafeteria, vending machines, at events and in the various community settings like classrooms. A food environment also refers to the pricing and cost of food and the marketing behind the food that is aimed to influence consumer food choices. Another aspect of the food environment is the social environment, which includes the “values, beliefs, norms, and attitudes of the community surrounding food and beverages.” (2) Finally, the policies and procedures that govern what foods and beverages can be sold in a facility such as a school are part of the food environment.

Questions:

How would you describe the food environment in your school? Do you feel that the food environment in your school supports healthy eating for students and staff? Why or why not?

Do you have any challenges with promoting healthy eating in the school? Why?

Can you think of any barriers or facilitators to promoting a supportive food environment?

Do you foresee a supportive food environment having any impact on school fundraising?

What changes, if any, have you implemented to create a more supportive food environment?

Are you familiar with the Healthy Schools Toolkit distributed by Public Health? If yes, have you used it?

Does the school environment contain culturally inclusive foods or messages for Indigenous students? How so?

Nutrition policy in school:

What policies influence your school food environment?

When you think back to when you first implemented the School Food and Beverage policy, what helped or did not help?

What do you think about the 10 “special-event” days outlined in the School Food and Beverage policy?

How are these days used at school?

Do you think your school’s nutrition policies have achieved their expected goals?

Are there any additional policy changes that would improve your school environment?

What role have the parents in your school played in the implementation of these policies?

Does the school have a policy about sending a note home if teachers have concerns regarding a student’s eating habits?

Curriculum Questions:

Do you feel teachers are given the tools, training, and resources needed to effectively teach the food and nutrition concepts outlined in the curriculum?

Where do teachers access resources for nutrition instruction in the classroom?

OPHEA?

Dairy Farmers resources for the curriculum of grades 4 and 8?

International resources?

Other? _____

Do any of the following scenarios apply to the use of food in the classrooms at your school?

- ☐ Demonstration in a lesson plan (e.g. used in math, science or language)
- ☐ Food used as a reward
- ☐ Offered in class as snack (Popcorn with a movie, Freezie day)
- ☐ Used in activities such as in competitions or games
- Used for celebrations or events (100th day)
- Other: _____

Student Engagement:

A supportive school environment can positively influence a student's food and lifestyle choices.

Are students allowed to take water or snack breaks during class time?

What food-related activities has your school been involved with?

☐ Ontario Student Nutrition Program (OSNP)

☐ Fundraisers (Bake Sales)

☐ Fasting/food challenges

☐ The Great Big Crunch

Are there opportunities for students to demonstrate peer leadership related to these nutrition initiatives?

What value have nutrition initiatives had in your school?

Do you feel staff are role modeling healthy eating behaviours in school settings?

How does your school administration support these behaviours in staff?

Have you evaluated any of the school nutrition initiatives or policies to measure their effectiveness?

Community Partnership:

Does the school participate in Farm-to-school initiatives or programs such as the "Fresh from the Farm" program?

Does the school have partnerships with community food programs such as "The Good Food Box"?

Does your school have any supports for students who do not have adequate food?

Can you tell me about what professional supports your school has from the community? (This can include mental health nurses or Registered Dietitians)

Final questions: Discussion

Is there anything else you would like to add that we have not already discussed?

If there was one thing that could be done in your school to improve the food environment, what would it be?

Can Public Health contact you to follow-up on your participation in this research project?

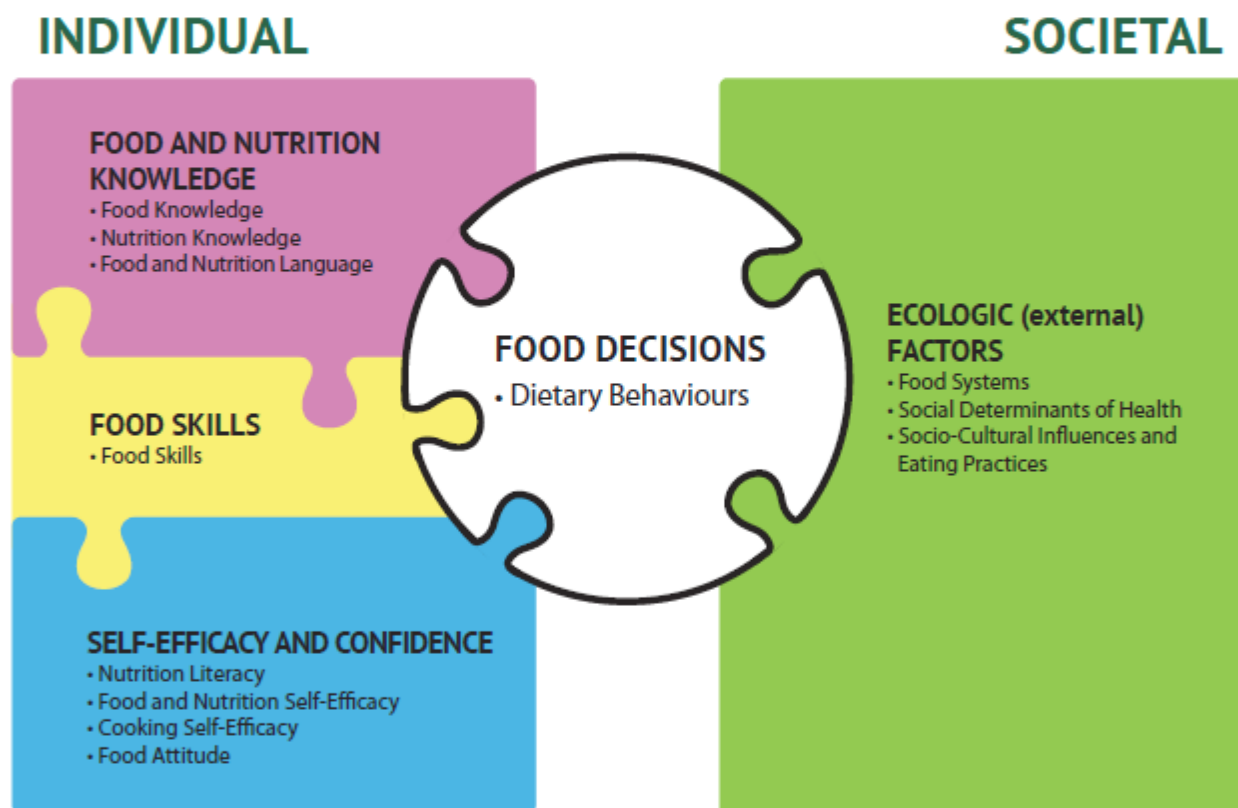
Appendix D: Foundations for a Health School Framework (35)

<u>Foundations for a Healthy School Framework</u>	
Curriculum, Teaching, & Learning:	Identifying teacher-approved curriculum and teaching resources that support students to demonstrate and apply food literacy.
School & Classroom Leadership:	Exploring how food is used in classrooms and schools to support learning and leadership
Student Engagement:	Observation in common areas of the school such as cafeterias and foyers to describe promising practices in engaging students about and through food (incl. promoting student access to school cafeterias).
Social & Physical Environment:	Identify how school physical environments improve access to healthy foods and food programming that reduces disparities in access to food.
Home, School, and Community Partnerships:	Explore how schools are linking to local food systems and using food in community outreach initiatives .
Support for indigenous inclusion	in the curriculum and culture of the school food environment.

Figure 1. Using the Healthy Schools Framework, questions in the interview guide were adapted to obtain data relevant to the six relevant areas.

Appendix E: Food Literacy: Framework for Healthy Eating (36)

Food literacy includes interconnected attributes organized into the categories of food and nutrition knowledge; food skills; self-efficacy and confidence; food decisions; and ecologic (external) factors.



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