UNDERSTANDING SCHOOL FOOD IN NEWFOUNDLAND AND LABRADOR

THROUGH A SYSTEMS FRAMEWORK

by © Emily C. Doyle (Thesis)

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Abstract

Using systems thinking, I address the question of how to improve school food in the province of Newfoundland and Labrador (NL). Chapter Two provides an interdisciplinary review of school food literature. This review establishes the rationale for adopting systems thinking as a conceptual and analytic tool. The systems methodology used in this dissertation is described in Chapter Three. In Chapter Four I review what is known about school food in the NL context and describe the gap to be filled by using multi-method research to answer the following questions: What school food programs and policies exist in NL? What knowledge and attitudes exist about the current school food system? How do knowledge and programs interact to facilitate or inhibit development of a more healthy and sustainable school food system? Next, three research-based chapters contribute to new understanding. Chapter Five is a case study about a school greenhouse. The case study took place earlier in my PhD program and helped lead to the adoption of the systems methodology applied throughout this dissertation. Chapter Six is based on a survey of 68 principals. The results of the survey highlight the persistence of variability as a key defining feature of school food in the province and the need for more responsive and collaborative tools to assess and enhance school food systems across the province. Chapter Seven discusses findings from 34 key informant interviews of stakeholders throughout the system of school food in NL. An analysis of these interviews shows how school food system innovators drive systems change by responding to system weaknesses as a source for strategic collaboration and learning. Taken together, the findings provide a deeper understanding of how persistent and substantial barriers make interventions ineffective. Future areas for learning and collaboration are identified. I suggest that collaborative and critical knowledge about the NL school food system is essential for future transformation.

Keywords

General Summary

It is important to consider how school food in the province of NL connects to learning, health, and the sustainability of the planet. The persistence of unhealthy food in the province's schools in the context of the emergence of innovative national and international strategies to improve school food, provide the impetus for this research. By investigating current policies and programs, knowledge and attitudes of stakeholders and the way programs interact in the NL context, I provide new insights into the school food system in NL which relate to school food systems in both Canadian and international contexts.

A case study of a school greenhouse highlights the challenges of maintaining a holistic intervention in a society which tends toward fragmentation and linear outcomes. A survey of school principals confirmed the need for school based tools to learn about and more effectively respond to the large degree of variability in school food across the province. Interviews with key stakeholders in the school food system highlight how current efforts to positively transform school food confront two key barriers. First, schools have been unable to maintain food standards that do not line up with less stringent food standards in the broader food environment. Second, the system of accountability governing the school system tended to underrate the value of school food in terms of learning outcomes and sustainability. Providing insights from innovators in the school food system, the interviews also demonstrated promising examples where school food programs have depended on collaborative learning to lead to transformation. Areas for future learning and collaboration to strengthen the system of school food in this province are identified including: 1) discovering the possibilities for, and barriers to, connecting fish and the fishing sector to learning and eating in school; and 2) using the knowledge gained here to strategically respond to the challenges introduced by COVID-19 for school food.

Land Acknowledgement

I respectfully acknowledge the territory in which this research took place, the island of Newfoundland, as the ancestral homelands of the Mi'kmaq and Beothuk. I would also like to recognize the Inuit of Nunatsiavut and NunatuKavut and the Innu of Nitassinan, and their ancestors, as the original people of Labrador. I strive for respectful relationships with all the peoples of this province as we search for collective healing and true reconciliation and honour this beautiful land together.

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List of Abbreviations

CSFP	Conseil scolaire francophone provincial de Terre-Neuve-et- Labrador
CSH	Comprehensive School Health
DEECD	Department of Education and Early Childhood Development
DCSSD	Department of Children, Seniors, and Social Development
DHCS	Department of Health and Community Services
HSHS	Healthy Students, Healthy Schools
HSP	Healthy School Planner
INFORMAS	International Network for Food and Obesity/non-communicable diseases Research, Monitoring and Action Support
JCSH	Joint Consortium for School Health
KES	Kids Eat Smart
LGT	Little Green Thumbs
NL	The province of Newfoundland and Labrador
NLESD	Newfoundland and Labrador English School District
PHN	Public Health Nurse
RHA	Regional Health Authority
SFEAT	School Food Environment Assessment Tool
SFG	School Food Guidelines
SHPLC	School Health Promotion Liaison Consultant
SSHRC	Social Science and Humanities Research Council

List of Appendices

Chapter One: Introduction: Walking Through this Dissertation

This introduction uses the metaphor of taking a walk on a snowy day. I pass over the snowy terrain three times to describe the journey that led to the completion of this thesis. On the first pass, the main objective is to form a trail. This first pass allows me to describe to you what brought me to this research. On the second pass, the initial path is filled in with definite steps that outline a clear path forward. This second pass provides the rationale for this research, a definition of school food, and describes how this research fits in with what is known within school food theory and practice. On the third pass over the snowy trail, less energy is required to make the trail and new observations can be made. Here I will highlight key findings from my research and provide a roadmap through the thesis.

1.1 The First Pass: Breaking Trail

1.1.1 *Personal connection to school food.*

My study of school food began with a personal connection. Food has always been an obsession of mine. When I was a child, my father was a food wholesaler and distributer, which brought direct and immediate access to a variety of food and toiletries into our household. Later I travelled to and lived in South Korea, which opened my mind to a different diet based on thousands of years of culture and place. In Korea, fruit, vegetable and fish markets were found throughout the country; every piece of land was used for some purpose. Moreover, people placed a high value on being able to escape from the city to the outdoors and to nature. Experiencing the food culture of Korea led me to think differently about the food culture I had identified with on the island where I have grown up (Newfoundland) in my home province of Newfoundland and Labrador (NL) on Canada's east coast.

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Shortly after living in Korea, I lived in Montréal where I became steeped in local food activism. After I returned to Newfoundland, I began seeking out alternative ways of living (and eating). I engaged in what at that time was an emerging local awareness about the benefits of, and potentials for, local food. When I relocated to a small town in NL to work on an organic farm, my neighbor, Mary, thought differently about the benefits of local food than I did. When raising her family in the 1950s, Mary kept her own pigs and garden, practices that she no longer found necessary. She looked at me in disbelief that someone would choose to go backwards into those dark, precarious days of self-reliance. These different attitudes were indicative of the dramatic change in perspective as Newfoundlanders moved from traditional to industrial food systems. The evolving school food system and the contextual features that impact that system still reflect this shift from a traditional to an industrial food system.

My research topic emerged while I was volunteering with food-security organizations and active in food-system community-engagement projects in the province. Through these activities I came to know the people and organizations working on school food and became interested in understanding what schools were doing to embrace food system thinking and also about the impact of these actions. I wanted to find and support the types of activities I saw in Montréal and Korea and to understand why these actions were not present here. In Newfoundland and Labrador, I found that local food availability was limited and people relied heavily on imported food and produce.

Food system thinking refers to food system sustainability. Early on in my PhD, I discovered the work of the Think and Eat Green @ School (TEGS) project in Vancouver, British Columbia and this project greatly influenced my vision of a sustainable school food system. TEGS asked how could school food be used to catapult society into a more sustainable,

conscious livelihood. Two important aspects of the TEGS understanding of school food that I latched on to were:

- Understanding school food as a system; and
- Understanding that an important part of transforming the system for the better is in collaboratively developing understanding of how the system functions.

In the process of researching this topic I had to confront and reflect on where I fit as a person and as a researcher within the system of school food in NL. At the outset of the project, I assumed that I had full access to what I understood to be 'NL food culture'. Throughout this process I have come to recognize that the food culture I had identified with was based mainly on more recent European settler practices and tended to ignore the history and experiences of Indigenous peoples. Discovering this gap helps me to better understand the limits of this research and the potential for future research. I will address this topic further in the final chapter.

I have participated in and provided output from my research when possible. I submitted a report of initial findings to the Premier's Task Force on Educational Outcomes. From 2018-2019 I had a contract as a School Health Promotion Liaison Consultant (SHPLC) with Eastern Health. I was a member of the Advisory Committee for the School Food Guideline Assessment conducted by Food First NL for the province in 2018. I am also a parent of three school aged children and I volunteer with my children's school garden and breakfast program.

1.2 Second Pass

In the second pass I will provide a working definition of the topic of school food, the one I use in this research. This begins with an explanation of why school food matters. I will also describe in more detail what a system of school food is and how that relates to what is known about school food in NL.

1.2.1   *Why it is important to research school food in NL.*

School food matters (The Coalition for Healthy School Food, 2021a) for four reasons. School food:

- encourages healthy eating amongst young people;

- contributes to student learning and success; and

- supports local food production and the economy.

To explain the importance of each of these in the context of the province of NL, I highlight some important provincial realities. Firstly, NL has the shortest life expectancy among the Canadian provinces (Statistics Canada, 2009). Furthermore, in 1986, the Canada Health Attitudes and Behaviour Survey found that "Newfoundland's children have the least healthy eating habits of all Canadian children" (Hanrahan & Ewtushik, 2001, p. 83). Fast forward thirty-two years to 2018, and an analysis of data from the 2015 Cancer Risk Assessment in Youth Survey showed: "Students in Newfoundland and Labrador reported consuming nutritious foods and beverages least frequently (7.3 times per day, 95% CI 6.6-8.0), while students in British Columbia reported consuming nutritious foods and beverages most frequently" (10.2 times per day, 95% CI 9.4-11.0) (Acton et al., 2018, p. 940). These realities suggest that an investment in encouraging and supporting healthy eating among young people is potentially a critical strategy to prevent the troubling and persistent negative health outcomes experienced in this province.

The second reason why school food matters is that school food potentially contributes to learning. An investment in the development of a vibrant school food program can potentially improve student academic performance (Hernandez et al., 2018; Oostindjer et al., 2017; Robert & Weaver-Hightower, 2011). This is relevant for NL as a province where, as stated in the Premier's Task Force on Educational Outcomes, "…too many students in NL are

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underachieving, struggling with reading and basic mathematical functions…" (Collins et al., 2017, p. 3).

The study of unhealthy school food in NL also provides important insights into the broader food system. NL has high levels of food insecurity (Tarasuk & Mitchell, 2020), enduring and wide inequalities (Omner et al., 2017), an economic reliance on fish and oil with collapses seen in both industries (Smellie, 2020), and a heavy reliance on imported food (Food First NL, 2015). An appropriate school food system can help address these potential weaknesses in the food system (Hernandez et al., 2018; Morgan & Sonnino, 2008).

Beyond the three reasons noted above, a fourth reason why school food matters is that school food potentially builds an understanding of how all of these matters are interconnected. This understanding could contribute to a paradigm shift in how NL society organizes and understands itself to address complex social problems and their interconnections. The school food problem is emblematic of other entrenched and complex social problems that characterize the 21st century and it is imperative that social scientists develop effective tools to respond to this situation (Byrne & Callaghan, 2014).

1.2.2 *School food as a system.*

The question of school food connects to conversations in food policy and public health over whether food is just about nutrition. Why people eat, what they eat and how food systems operate also connect to material, biological, social and cultural factors (Lang, 2009; Rayner & Lang, 2012). Within the school food literature, a number of researchers have adopted the understanding that school food as a system requires consideration of how multiple factors combine to influence school food (Black et al., 2015; McIsaac et al., 2019; Rojas et al., 2011). This type of thinking requires researchers and practitioners to move away from traditional and

reductionist perspectives (those which focus mainly on nutrition) on school food change, towards a more systems-based critical approach. Morgan and Sonnino even proposed the concept of a "school food revolution" which connects school food to concerns about food production, nutritional health and environmental sustainability (Morgan & Sonnino, 2008). Systems thinking is a way of thinking which emphasizes interconnections and relatedness (Cabrera, 2006). In the following section I will describe how the problem of school food can be addressed through an interdisciplinary lens, a form of systems thinking, in an effort to respond to fragmented understanding of school food.

1.2.3   What is school food?

For our purposes, the notion of school food covers many aspects: how children eat at school; how the school setting influences each student's understanding of food; how schools engage students in thinking about the entire food cycle; and how the food practices of the broader community are influenced (Rojas et al., 2017). Discussing these diverse aspects of school food is inherently interdisciplinary; food, education and health systems are interconnected through a number of disciplines. This interdisciplinary and holistic view of school food evolved from a long history of school food research that started when school food proponents became concerned with the level of child hunger (Oostindjer et al., 2017). We have come a long way since then. Contemporary school food advocates now ponder much more diverse concerns. Oostindjer et al., for example, asked how might school food "help . . . tackle current challenges in health and sustainability"? (Oostindjer et al., 2017, p. 3947). They consider the intersection of school food with approaches to food education, the school social environment, and the food environment.

1.2.4 School food research in Canada and in Newfoundland and Labrador.

Interest and discussion about school food in the province of NL has been consistent throughout the 21st century (Coalition for School Nutrition, 2001; Dietitians of Canada et al., 2005; Government of Newfoundland and Labrador, 2007). Elsewhere in the country, school food research has taken into consideration a more critical approach, connecting to discussions of the broader food system (Black et al., 2015; Martorell, 2017a; McIsaac et al., 2019; Rojas et al., 2017). These broader considerations about the problems of school food in other parts of Canada have highlighted the importance of research in supporting collaborative and innovative practices in a system that is both fragmented and vulnerable to the negative influence of the industrial food system.

Discussions of school food in Canada have also described how school food can help counteract fragmented-reductive thinking, the kind of thinking that helps explain why unsustainable food systems currently remain in place. Writing about school food in Canada, Sumner and Wever (2016), suggest that school food-related learning can be a catalyst for a change. It can encourage a critique among students (future adults) of the current industrial system and the need to create more sustainable alternatives.

1.3 Third Pass – Overview of Research Goal, Research Questions and a Road Map of the Dissertation

When I began my PhD research in 2012, I focused solely on school gardens. I started a pilot project to find out about the benefits and sustainability of school gardens. This initial investigation helped me realize there was a gap between the flourishing academic literature on school food and people's approach to school food in NL, the approach that I discovered in my pilot project. Over time, my research focus started to shift. It no longer seemed feasible to just

focus on school gardens. I submitted a proposal to SSHRC in 2015 to assess the NL school food system. And this is how I ended up with the research focus I present in this dissertation.

In general, the goal of this dissertation is to enhance an understanding of the NL school food system and to show, in particular, how a systems-thinking approach can lead to new and different insights which have the potential to improve the NL school food system. To enable this goal, and after considerable reconsideration and reconceptualization of my field of research, I decided on the following research questions:

- What school food programs and policies exist in the province of NL?

- What knowledge and attitudes exist about the current school food system among educators/school food system stakeholders?

- How do knowledge, attitudes and programs interact in context to either facilitate or inhibit transitions toward a more healthy and sustainable school food system?

1.3.1   Roadmap.

In the following chapter I will review the literature on school food. Next, in Chapter Three, I will provide an overview, rationale and description of the research design and methods used. Chapter Four applies the conceptual framework set up in Chapter Two and Three to help present what is known about school food in the province of NL.

Chapter Five contains the findings of my pilot case study of a school greenhouse—*Living Lessons of the School Food Environment*. As mentioned above, this is the pilot study which helped shape the direction of this study. One of the key discoveries of my work on the greenhouse pilot was how, over the 20-year history of the greenhouse, this endeavor had to be consistently rethought and adjusted, as funding came and went and as social trends reshaped how its outcomes were reconsidered. Through my analysis, I realized that a long span of time, and

taking a broader more holistic perspective, was necessary to analyze the movement (or stagnancy) of school food systems.

Chapter Six presents the results of my Survey of Principals about the NL School Food System carried out in 2016. Key findings from the survey include:

- Variability was the most common characteristic governing the time students were given to eat. Inconsistency in the time students were given to eat is an important indicator of a lack of consideration of the quality and importance of eating time.

- The almost universal existence of allergy bans (bans in 88% of schools surveyed) is notable and leads to the question of what supports are available to schools to provide accurate and updated knowledge about how to categorize banned foods or even whether it is advisable to ban foods and if so, when.

- Sixty percent of all survey respondents (41/68) listed at least one fast-food destination as a place that students frequent for lunch.

- The most commonly mentioned support as a source of healthy food for students at school was the Kids Eat Smart (KES) program. Other supports in place such as the regional nutritionist and SHPLC were accessed differentially by school staff members across regions of the province.

Chapter Seven reports on the key informant interviews conducted with stakeholders from various parts of the school food system including health and educational professionals, school food providers and community organizations. Key findings from the interviews conducted in 2016 are:

- An absence of training and resources that would allow principals to enforce the school food policy, and an increasing amount of stress amongst teachers.

- The primary targets surrounding eating and serving food appeared to aspire toward fast and cheap food.

- Catering companies are struggling to make a profit which many see as the reason the companies tended to offer the cheapest food possible.

- Some viewed allergy bans as a necessary way to keep students healthy, but others viewed these as preventing a majority of children from accessing healthy foods.

- Significant fragmentation among different components of the school food system needs to be addressed if we want to build more healthy and sustainable school food systems. This fragmentation refers to a disconnect between the event of eating at school, professional development of principals and teachers, niche innovations in school food, and the broader restructuring of education.

- Multiple and innovative examples of teachers and community organizations connecting food to various learning outcomes (including social emotional learning, mathematics, science and literacy) were found. This finding starkly contrasts with findings from the survey of principals; the latter generally believed that food teaching and learning only occurred in health class.

- The examples of innovation helped to unveil how collaborative thinking and understanding is required not only to learn about food systems but also to help build a better infrastructure of school food in this province.

The final chapter (Chapter Eight) summarizes the dissertation and outlines recommendations and avenues for future research.

Chapter Two: Literature Review

The literature search was conducted as an integrative review focused on achieving holistic understanding of the topic (Snyder, 2019). The process of engaging with the literature has taken place continuously from the beginning of my PhD throughout the writing of this dissertation. This review of literature involved prioritizing publications which considered the interdisciplinary nature of school food research. I searched various databases including PubMed, ERIC and Google Scholar, and tracked through the network of citations in resulting publications to reach a point where the literature came full circle in the sense that a majority of citations led to articles that I had already encountered (Cabrera, 2006).

Within the field of school food there are a number of core concepts including, *school nutrition*, *school feeding program*, *school food environment*, *school food system*. These concepts drove the search of journals, articles and books concerned with the study of food systems, food security, school health, public health, sustainable education, and place-based education. I have organized this review of school food literature by focusing on different ways of talking about school food: school food is political (Robert & Weaver-Hightower, 2011); school food varies according to context; and interdisciplinary approaches to school food are exemplified in school garden research (Repko, 2012). It is by highlighting the various ways of talking about school food that I justify the importance of focusing on school food as a system.

2.1 School Food is Political

As most schools are public institutions governed by the state, the offering of food services within schools depends on the policies within the nation or province. School food policies also connect to the larger subject of food policy which once was concerned mainly with agriculture (and fishery) policy, but now refers also to intersections with nutrition, trade,

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ecological and social policy (Lang, 2009). In their book, *The School Food Revolution* (2008), Morgan and Sonnino describe how school food fits within this broad consideration of food policy. Drawing on case studies of different school food systems from around the world, they describe how the British school food system, like the US system, was initiated to safeguard the health and well-being of children. Both countries' school food systems deteriorated in the final quarter of the 20th century. One factor leading to this deterioration was the inability to account for the health gains from nutritious food within a system that favoured the delivery of too much of the wrong food.

Morgan and Sonnino (2008) coined the term "school food revolution" to describe a point in time when the real nature of a school food system is widely understood and when good food on the child's plate is the norm and not the exception (p. xv). Morgan and Sonnino emphasize that in the 21st century, school food policies need to respond not only to food production and nutritional health but also to environmental sustainability.

The importance of the connection to the broader context and politics of school food is corroborated by Robert and Weaver-Hightower (2011). They call for an ecosystem view of school food and stress the need to ask: Who feeds whom, and what and why? Taking a broad approach to understanding what social relationships exist and must be adapted, or what challenges reside in the environments or processes is what Robert and Weaver-Hightower (2011) call the policy ecology of school food.

Oostindjer et al. (2017) see this kind of expansive thinking as having developed out of earlier, ineffective visions of school food. They suggest that delineating the phases of school food is a useful way to outline conceptual differences (Oostindjer et al., 2017). They note that during Phase I, prevalent between 1850 and 1950, emphasized food security for lower

socioeconomic groups was the core focus. In Phase II, emerging around 1970 in developed

countries, the emphasis was on food quality and on shifting from a focus on undernutrition to

malnutrition. This was a reaction to the increased prevalence of lifestyle diseases, such as obesity

(Oostindjer et al., 2017). Elements of both these phases continue today, while a Phase III has

emerged. Oostindjer et al. (2017) state:

> To date, a focus on food quality during Phase II has been inadequate to resolve the
>
> current societal and individual challenges of the reduction of obesity and malnutrition in
>
> a sustainable food context. In contrast, the focus in Phase III is upon prioritizing
>
> community and societal impacts of food and food related school meal activities. A shift
>
> towards this phase is already observable. (p.3944)

The emerging Phase III in school food thinking appears to emphasize both the societal

nature of the challenge and implications for environmental sustainability. This phase of

development in school food thinking aligns with the concept of a "nutrition transition."

According to Rayner and Lang (2012), "[T]he nutrition transition is a cultural and societal

transition, not just an eating one" (p. 211) and thus it demands cross-sectoral responses. The

increasing complexity of the nutrition transition creates a need for public health practice to move

"away from improving nutrition in 'old' environmental circumstances, such as improving the

sanitary environment, to the 'new' environmental circumstances, in which environments are

clean of microbes, but 'dirty' in cheap processed foods" (p. 209). Additionally, the nutrition

transition also refers to technical changes in how food is grown, processed and distributed. With

the nutrition transition, new, broader and systematic considerations emerge, which public health

officials need to address. This includes questions about who controls the nature of food and food

products and how advertising, marketing and cultural pressures drive the uptake of nutritionally

poor dietary ingredients. Such questions are also addressed by Nestle (2011) in her study of school food in the United States.

Nestle (2011) states "for the federal government to suggest that anyone eat less of any food does not play well in our political environment; such suggestions hurt sales" (p.144). Nestle paints a picture of failing congruence between the two missions that precipitated the American school lunch program: the promotion of American agricultural products and advising the public on how to best use these products. There was no conflict when the dietary advice of the government was to eat more, but when they told people to eat less, the conflict began.

Nestle describes a dilemma that confronted the US Department of Agriculture, when concerns about health problems shifted to chronic diseases and how to promote foods that are overproduced, while at the same time asking the public to eat less of them. The overproduction of food in the US led to a big incentive to marketers to make food products with cheap raw ingredients like fat and sugar and to market these products to children. This situation is described by Robert and Weaver-Hightower (2011) as contributing to the paradox associated with current school feeding and nutritional education ecology in the United States, where junk-food breakfasts, minimal physical activity and healthy eating curriculum all occur in the same school. The curriculum engages with the notion that students have control and must make wise choices, while at the same time school food and politics involving multiple levels of governance shape those choices.

Phase III of school food aligns necessarily with a critical view of the food system. While some variations of school food across the world may support the status quo, learning about food and nutrition through food programs at school can also be a catalyst "for the kind of change that will encourage critique of the current industrial food system and the creation of more sustainable

approaches" (Sumner & Wever, 2016, p. 321). Gilbert et al. (2018) describe school food as "an ideal entry point for introducing a just transition to the local food system, enhancing food equity built from healthier social, economic, ecological, and political systems." (p.95). They see public education systems as having a role in and responsibility for managing and enhancing community food systems through public policy. This idea echoes Morgan and Sonnino's (2008) insights into the bidirectional relationship between school food systems and the rest of society: not only are school food systems influenced by social dynamics, but they can come to play a role in influencing those dynamics.

Examples of the application of a critical food-systems perspective to school food in the Canadian context help to unpack the dynamic relationship between school food and social norms. Winson et al. (2012) refer to a misaligned educational context defined by cutbacks and a fragmented food system where stakeholders and institutions that shape the food system tended not to talk to actors concerned about the distribution and healthfulness of these products. Sumner and Wever (2016) describe how the school food environment presents rich opportunities for critical food pedagogy. Defining the school food environment as food available through vending machines, canteens, cafeterias and food available in restaurants and fast-food outlets adjacent to the school, they distinguish between pedagogical encounters that will support the status quo and those that can catalyse personal and/or societal change. They describe how school gardens, as an example of a pedagogical encounter with food at school, have the potential to counter the disconnect between food and consumer that epitomizes the corporate food economy (Sumner & Wever, 2016).

Another example is the Think and Eat Green @ School (TEG@S) which takes a broad view of school food based on the understanding that: children eat at school; the school setting

can influence students' understanding about the wider food system; schools can engage students with the entire food cycle and be critical institutions that help to form understandings of food, health and civic responsibility; and school programs can influence the broader community to promote healthy and sustainable food practices. The TEG@S project was built on a research process defined by collaboration with stakeholders throughout the school food system to identify opportunities to generate knowledge and to devise and implement locally appropriate action to create desired change (Rojas et al., 2011). The project was built on a recognition that there were many positive school food system opportunities in British Columbia but that they were functioning independently.

One such opportunity included an initiative between the University of British Columbia and provincial public schools to develop food system curricular resources. Others included non-profit groups who were engaging schools in gardening and cooking programs. There were also other farm-to-school and public health projects and interest from the board of education. Think and Eat Green @ School set out to strengthen collaboration between these independently functioning opportunities through a number of actions including offering small grants to schools, offering professional development, undergoing collaborative inquiry with stakeholders and engaging university students in experiential-learning projects with schools. This multi-year, cross-disciplinary, action-based research project led to the finding that there is a continuing need to further "integrate research, teaching and action on global food security, environmental and public health challenges, and build connections to create healthy, sustainable school food systems" (Rojas et al., 2017, p. 25).

Inherent in the TEGS framing of the school food system is a focus on developing a collaborative understanding of a number of localized factors and processes connected to the

transformation of the school food system. The goal of this school food transformation is to support a transition to more sustainable community food systems, while nurturing an understanding among young people about the links among food, health and well-being (Rojas et al., 2011). In the following quotation, Rojas et al. (2011) describe how a school food system can

> provide opportunities for students and staff at all levels to reconnect with the sources of their food and to learn to see food as the grand connector of all aspects of human life, including the relationship between humans and nature. The ways in which we learn about the connections among food, health and the environment at school, both explicitly and by the modelling of behaviours, have a lasting influence on the health of children, the school community and the ecosystems in which schools are located. (p.766)

The School Food Environment Assessment Tool (SFEAT) was also a product of the TEG@S project (Black et al., 2015). This tool was developed in response to an absence of knowledge about the degree to which schools were engaged with food-systems issues. The SFEAT was designed to support the building of a common language to describe the multiple domains where schools are taking action. It helps to outline some factors and processes considered in a school food system. They include: (1) the availability of healthy food; (2) food teaching and learning; (3) engagement with community; (4) food preparation; (5) gardens/composting; (6) availability of environmentally sustainable food; and (7) the integration of school food actions along the food system.

Black et al. developed the SFEAT because they found that "existing tools largely evaluate only narrow components of school food environments, such as local food-procurement policies or access to healthy food in lunch programs, but seldom concurrently consider multiple facets of complex school food systems" (Black et al., 2015, p. 2). The SFEAT aimed to

document the complex nature of how and where progress was made and which interventions were most effective.

Examples from the Think and Eat Green @ School research show how transformative learning can occur when food is used as a learning tool to respond to the structural barriers impeding not only school food but the broader food system (Rojas et al., 2017). These include experiential learning based on cooking, growing and preparing food, and the practical experience and confidence gained from these activities; the connection between food teaching and strengthening holistic pedagogies; and the benefits of engaging in school-wide collaborative teams.

Since 2013, researchers in Nova Scotia have developed an increasingly critical and systemic framework for their ongoing research on the school food/school health environment in that province (McIsaac et al., 2013; McIsaac et al., 2015a; McIsaac, et al., 2015b; McIsaac, et al., 2015c; McIsaac et al., 2015d; McIsaac et al., 2017; McIsaac et al., 2018; McIsaac et al., 2019). This research shows how a lack of resources and an unhealthy food environment are among the barriers preventing schools from responding effectively to what is a complex societal problem. Similar to the paradox in the U.S. school food system described by Weaver and Hightower above, McIsaac et al. (2013) report that teachers believe unhealthy messages about food promoted by the broader community undermine classroom lessons about healthy eating. McIsaac et al. (2018) highlight the need for systemic responses which will promote preventative and system-level actions. Systemic responses would include fostering organizational capacity by developing partnerships, engaging multiple stakeholders in decision making, establishing norms for school practices and transforming the culture of the school (McIsaac et al., 2013). The adoption of a systems approach within their research on school food was a response to their

finding that even with the implementation of school food policy and investment in school health

promotion, significant barriers remained for improving the school food environment. These

barriers include a lack of visioning and support from school districts, a lack of integration

between health-promotion endeavours and educational values, and challenges to healthy living,

including "increased cost of healthy food, pervasiveness of fast food and the challenges to keep

pace with increasingly busy family schedules . . ." (McIsaac et al., 2013, p. 5).

McIsaac's research in 2019 shows how the elements of the school food system interact in

Nova Scotia. This research emphasizes the importance of analyzing the systemic barriers in

which school food is enmeshed to better understand the implementation of school food policy.

This research involved semi-structured interviews with various stakeholders influencing the

school food system in Nova Scotia and an analysis of the interviews using a systems framework.

Their analysis led them to propose intervention points for systems change. A critical point of

intervention was the issue of conflicting interests within the school food system. Examples

include situations where there is no time for eating at school, the problem that healthy eating

policy has the unexpected effect of limiting the affordability of food at school and conflicting

views about the importance of developing positive food culture at school.

2.2 School Food Varies According to Context: Research in Canada

In the previous section I discussed how systems approaches to school food can enable a

critical understanding of how school food connects to the broader social and political

environment. In this section I will review how there are multiple variations around the world

(and within Canada) that inform what we come to expect when we think of school food. Choices

all along the system of school food (in procuring, preparing, eating, teaching, wasting) intersect

with social justice, human health, economic development and environmental goals (Morgan &

Sonnino, 2008). I will review school food research in Canada to demonstrate the variability in this context and to explain how and why there needs to be a broader consideration of factors to support a revolution in school food. It seems that the next phase of systems change (a school food revolution?) may now be beginning to emerge in Canada.

Our understanding about school food in Canada has been evolving rapidly. Over the last five years or so, publications in the field of school food have blossomed (Acton et al., 2018; Black et al., 2015; Colley et al., 2019; Hernandez et al., 2018; Martorell, 2017a; McIsaac et al., 2018; McIsaac et al., 2019; Rojas et al., 2017; Sumner & Wever, 2016; Tugault-Lafleur et al., 2017, 2018). The release of a national food policy in Canada in 2019 stimulated discussion and research on school food programs (Government of Canada Department of Agriculture and Agri-Food, 2019). An often-cited fact is that Canada ranked 37th out of 41 countries on access to healthy meals at school in 2017 (UNICEF Office of Research, 2017). A discussion paper produced in preparation for the roll out of the national food policy described the interaction of the availability of healthy school food with the policy landscape in Canada (Martorell, 2017a). It highlights how jurisdictional challenges to school food policy in Canada start at a federal level and trickle down to the local level, where in many provinces there is a disconnect between school boards and regional health authorities (RHA). So while concerns about school food exist at a national level, school food policy falls under the jurisdiction of provincial and territorial governments, and in the case of Indigenous governments, under federal jurisdiction (Hernandez et al., 2018). Thus, each individual province, territory and Indigenous government may have a unique approach to school food, which leads to differences in policies, programs, actors and outcomes.

A case has been made for a national school food program and this movement is led by the Coalition for Healthy School Food (Hernandez et al., 2018; Coalition for Healthy School Food, 2021b) and is based on an overarching understanding that effective programs and policies should be comprehensive in nature (Hernandez et al., 2018; Martorell, 2017a; McKenna, 2010). The benchmark for comprehensiveness is *Comprehensive School Health (CSH)*, a term used to describe a multifactor approach to health promotion in the setting of the school. It was first developed in the 1990s by the World Health Organization (WHO), working with the European Commission and the Council of Europe (Stewart-Brown, 2006). The interconnecting components of the CSH framework are the policy environment, the teaching and learning environment, the social and physical environment, and community interactions. McKenna (2010) outlines five aspects to comprehensively support healthy eating at school including through attention to: (1) food and drinks available – nutrition standards and food programs; (2) food environment – food marketing and food availability near schools; (3) health education; (4) health services; and (5) family/community outreach. These aspects represent all of the components of a comprehensive approach to modifying the school food environment.

One challenge to comprehensive thinking and planning for school food is achieving agreement among stakeholders about delimiting the boundaries of where discussions of school food begin and end. For example, a recent investigation of the school food environment in Ontario employed the CSH framework to classify, compare and describe support for healthy eating in the implementation of school food policy. In this study, Orava et al., (2017) describe the CSH framework as including only food within the school, which they note as a drawback of the framework (Orava et al., 2017). The view that the school food environment is limited to food within the school contrasts with other discussions of school food programs and policies that

emphasize engagement with the surrounding community (Black et al., 2015; Hernandez et al., 2018; Martorell, 2017a; Morgan & Sonnino, 2008; Winson, 2012). Throughout this dissertation I use the terms school food environment and school food system interchangeably and the SFEAT is used to help define the boundaries of the school food system.

Overlapping approaches and concepts of school food in the literature make it difficult to synthesize research about school food in Canada. Researchers, such as Acton et al. (2018), have focused on the difficulty of collecting consistent evidence about school food policies in Canada due to a lack of nutritional surveillance data and the way in which the success of school food policies depends on the vastly different school meal contexts across the country, with a combination of such things as school meal services and programs, fundraisers, and vending machines.

There is evidence that Canadian children are not eating a nutritious meal or meeting nutritional standards during school hours. Tugault-Lafleur et al. (2017), for example, report on the dietary intake of students across Canada during school hours. They found that one third of total energy for the day was consumed at school and nutrient and vitamin intake was lower during these hours.

Public investment in school food varies throughout the country based on whether the investment is considered to be within a poverty-reduction or a health-promotion mandate. Martorell (2017a) describes how this issue has hampered efforts to understand the implementation and effectiveness of school food across Canada. For example, tensions concerning the potential stigma associated with a program that prioritizes low-income people may conflict with the principles of inclusivity from a health promotion lens. Further, Martorell explains how a health lens on a school program would place high value on the health criteria of

food items, while a poverty-reduction program may permit or even prioritize acceptance of food donations with less concern about the nutritional content of food.

Approaching school food literature through the lens of food security helps to highlight how tensions between different approaches to school food align with different approaches to food-security intervention. According to Martorell, the first approach to food security is food assistance, referring to a charity-based approach. The second approach to food security is food access policies and programs which focus on community empowerment. The third approach focuses not on delivery of health and social services by community groups, but on strengthening government programs to provide adequate income levels and other supports that would obviate the need for food intervention programs in schools (Martorell, 2017b).

The current status quo of school food in Canada could be seen to align with the first food security phase of intervention, given that phase is defined by minimal government intervention and a dependence on charity. There are indications that school food activities such as school gardens or farm-to-school programs (described as programs in which school food providers work in partnership with local food producers to feed school children) can be system shifting. Yet there is also need for caution as these programs may be reinforcing the current neoliberal beliefs in an attempt to fix the school food problem by relying on individual actions without addressing the larger societal issues that are at the root of the problem (Allen & Guthman, 2006; Phillips & Roberts, 2011).

Farm-to-school programs have been particularly criticized by Allen and Guthman as reinforcing health inequities, at least in the United States. While these programs attempt to fill gaps created by economic and political policies, the very dependence of farm-to-school programs on volunteers and private funding has consequences for social equity: those communities with

the greatest resources are more likely to develop better and longer-lasting programs. As an example of a similar line of thinking, Phillips and Roberts describe school gardens in Tanzania. They show how the school garden projects were unable to address the political and economic relations that governed access to food. Phillips and Roberts suggest that when school gardens were viewed only through an agriculture and nutrition frame, this failed to take into account for larger questions about who has power over provision of and access to food. To address food sovereignty, they conclude that school gardens also needed to be connected to poverty reduction and democratic goals (Phillips and Roberts, 2011).

Harris and Shepherd (2007) describe the necessity of framing a food-emergency program (in a single school in British Columbia) within the broader context of the restructuring of education and social supports. They refer to a debate among Canadian researchers over the value of school food programs. Harris and Shepherd disagree with the claim that school food programs increase stigmatization and are too dependent on subjective and speculative forms of evidence to justify their existence. In their research they view the emergence of a school food program in relation to shifts in federal and local school funding and to the economic and cultural context of the school. They find that the food program brought much needed nourishment to children who experienced a disproportionate amount of hardship. The important takeaway from Harris and Shepherd's research is that an understanding of broader cultural and political transitions helped to illuminate factors that ultimately justified the school feeding program. Harris and Shepherd describe a shift in Canadian policy from a public ethic of care values to neoliberal values in their discussion of the school food program. Harris and Shepherd observe that school food programs become a necessity when the state dismantles instead of builds up a social safety net (Harris & Shepherd, 2007).

In the following section I will describe how literature on school gardens can help to inform these broader discussions of the politics of school food and the importance of context. Insight about the interdisciplinarity of the school garden approach and its potential transformative impact on schools and communities will be used to help to connect and inform the diverse and sometimes disjointed discussions of school food in the Canadian context.

2.3 The Need for an Interdisciplinary Lens as Evidenced by Literature on School Gardens

In this review of the school garden literature I am going to discuss how school gardens, like school food systems, are interdisciplinary and potentially transformative. The case study (reported in Chapter Five), which preceded the completion of this broad literature review about school food, led to a hypothesis that perhaps the greatest barrier to the system-wide adoption and sustained support for school gardens was that, in their ecological re-imagining and transformative potential, they did not fit with the current school environment. The interdisciplinary nature of the school garden confronts the discipline-based nature of the school curriculum, and the typical division of outcomes organized according to disciplines.

Gardens have a long history within education dating back as far as the 1700s, as described by Gaylie who cites Rousseau's discussion of the garden as a model for learning (Gaylie, 2011). Some of the potential benefits from school gardens include support for academic achievement, improved nutritional intake, increased attachment to school, strengthened school communities and increased ecological conservation practices (Nowatschin, 2014; Ozer, 2007). While there is ample research describing the multiple positive outcomes and motivations for school gardening (Blair, 2009; Nowatschin, 2014; Ozer, 2007), it is typical for contemporary school gardens to suffer from issues related to funding, maintenance and sustainability (Nowatschin, 2014; Ozer, 2007; Sumner & Wever, 2016).

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To contribute to a holistic understanding of school gardens, Gaylie (2011) conducted a number of case studies in North America to explore urban school gardens through the history, philosophies, cultures and practices of the surrounding community. In defense of her holistic approach, she refers to changes in the environment, which demand changes to the way nature was perceived in learning in Western nations. She explains how democratic, local participation in learning needed to be part of a practice where ecology is interpreted as embedded in social justice and community well-being. She proposes a place-based approach to understand the garden more holistically. Her holistic yet grounded approach is necessary to appreciate the value and complexity of gardens in school and community settings. Her approach also echoes commitment to the process of collective learning, a concept central in health promotion.

One of Gaylie's (2011) case studies was of the garden at Grandview/Uuqinak'uuh Elementary School located in East Vancouver, where people have some of the lowest incomes in Canada. The school has a significant Indigenous student population, as well as a significant population of English as a Second Language students who recently immigrated to Canada. Gaylie found that this school garden provided a gathering place for learning, farming and food production. The school garden also promoted traditional and contemporary Indigenous ways of knowing and contributed to the community's need for literacy and life-skills programs for both parents and children. A comprehensive curriculum designed to reconnect people to nature and nature to cities was developed for this garden. According to Gaylie, the garden coordinator believed that school gardens can have far-reaching educational, health, and community benefits. This was an especially potent statement considering the level of poverty among the students, the discriminatory experiences they often experienced as a result of their racialization and/or indigeneity and their alienation from the broader community, their low self-esteem, and sense of

powerlessness to change the situation (Gaylie, 2011). Gaylie suggests that the school garden was potentially the start of a movement to engage students in experiential, transformative and environmental learning. This case demonstrates how the school garden as an intervention had a certain beauty, not just in the way it looked, but in the way it fundamentally affected people synergistically.

Ozer's (2007) review of the school garden literature found that most scientific publications about school gardens were found in the field of horticultural education and focused primarily on outcomes of health-related knowledge and food preferences. Ozer considers the potential to strengthen the school environment as a whole as the most promising aspect of school gardens. She concludes that an ecological understanding of the school garden helps to illuminate the "multiple pathways by which school garden programs may potentially strengthen the healthy development of students while strengthening qualities of the school and the relationships of schools to the broader community" (Ozer, 2007, p. 859). Ozer suggests that research on gardens should draw on the ecological principle of *interdependence* in which changes in one component of an ecosystem will produce changes in other components. This idea echoes an observation in Orr (1994) that one of the greatest ecological issues has to do with our failure to see things in their entirety. Schools are not well equipped to conduct actions with indirect outcomes in mind. Awareness of the indirect link between why school gardens may be started (for a number of reasons) and how they may effect changes elsewhere, has rarely been accompanied by this realization. In schools, the rationale for planned interventions tends to line up directly with projected outcomes; that is, we want to plant a garden to increase knowledge about food production.

A similar view of the potentially broad impact of the school garden is found in other Canadian research. Sumner and Wever (2016) describe school gardens as a site for alternative pedagogy with interconnectedness as one of the principles of garden learning. They describe how the school garden provides an alternative for the often mechanistic metaphors that are predominant in the current model of education. They believe that, "school gardens present a practical means for transformative interdisciplinary learning for sustainability" (Sumner & Wever, 2016, p. 325). Rojas et al. (2017) highlight the school garden as a potential entry point to start hands-on work with otherwise epistemically distant food systems. Such a hands-on connection counteracted the "placelessness" of a global food regime (Sumner, 2015, p. 85). Gaylie (2011), Sumner and Wever (2016) and Rojas et al. (2011), all recognize the potential power of school gardens as stepping stones of societal transformation.

2.4 Summary of Literature Review

One of the most important issues for me and my study is the acknowledgement of the often-unstated link between the problem of sustaining school gardens and the necessity of adopting a holistic understanding and ecological perspective in order for them to be successful. The tendency to neatly sort the multiple benefits of school gardens into distinct categories may be one of the barriers to realization of their full potential. The major gap in our understanding of school gardens is not related so much to a lack of study and interest *per se*, but rather how research on school gardens is conceptualized in the first place (Ozer, 2007). Gaylie suggests the adoption of "multi-faceted, multi-sectoral approaches to the complex problems facing the earth . . . requiring a blend of research, practice, philosophy, pedagogy and recognition of historical practices" (Gaylie, 2011, p. 12). She notes how, "today's gardens invite a multitude of new methods for teaching, learning and research" (Gaylie, 2011, p. 12).

Following Gaylie and Ozer, I propose that the fragmentation in research about school food is connected to gaps in the understanding of the intersections of school food as it is conceptualized by food systems, health and educational systems research. One of the barriers to changing the school food system in Canada is not a lack of evidence, or rigour of methods, but rather the limits of the conceptual frameworks used by researchers and the resulting incoherence of any research conclusions. Moreover, in earlier approaches to school food (described above as Phase I), there was an explicit connection between food security and income inequality. When the focus shifted to food quality, the issue of income inequality did not disappear. However, the discourse shifted to one where food was more often viewed as a problem for nutritionists to address rather than a problem for society to solve. Phase III of school food, a revolutionary moment, requires an interdisciplinary and systems-level shift in the way we talk about and conduct school food research. The arrival of Phase III will help us to connect previously disparate discussions including those concerning school food and non-communicable diseases, those focused on malnutrition and academic achievement, and conversations about the connections between school food and the current political and ideological conditions of the state.

The literature review began with a description of the political nature of school food. It showed that decisions that define school food systems intersect with multiple levels of politics and how multiple levels of food politics could be implicated in a revolution of school food with the support of transformative collaboration. A review of current challenges to modifying and understanding the Canadian school food system led to the conclusion that while there is the potential for school food to lessen food insecurity, to increase health and to improve education outcomes, achieving all of these depends on the particular context and setting within which school food initiatives are embedded and their form and objectives. The review of the literature

shows that one of the biggest barriers to achieving school food system change in Canada is the way in which the jurisdictional and philosophical divisions that exist pertaining to school food in Canada have disorientated and constrained a movement that potentially thrives on collaboration. Working through the literature revealed to me a distinct lack of systems thinking and a variety of conceptually weak understandings in studies of school food. This led me to conclude that these features were a central condition holding back a school food revolution in Canada. The lack of systems thinking in the literature was often accompanied by reform efforts that ended up having unanticipated affects including, for instance, paving the way for unhealthy food and by creating challenges for later researchers and practitioners in transformation efforts.

I conclude that the interdisciplinary nature of the topic of school food shows that understanding the impact and potential of school food is best achieved through an interdisciplinary framework, informed by contextualized knowledge of the school food system, and that crosses the boundaries that arise from current fragmentations in school food thinking, in schools, academia and society.

Chapter Three: Systems Transformation Principles Underpinning the Research Process

In this chapter I will attempt to build upon the literature in school food discussed in the previous chapter by showing how the CSH framework connects to an interdisciplinary school food system concept. I will describe how this study of the system of school food in the province of Newfoundland and Labrador (NL) will apply CSH as a framework to establish a systems understanding of school food. I will also describe how systems thinking has guided the research process.

3.1 School Food Systems Require Interdisciplinary Expertise and Approaches: Establishing the Boundaries that Frame this Investigation

Over time, researchers and advocates in the field of school health promotion have come to align their goals more directly with researchers in education. While the ultimate goal of health promotion and education is the same, that is, optimal human development, the challenge has been in determining whether objectives and actions are to be measured and achieved through the field of health or through the field of education, with both fields traditionally having distinct tools of evaluation.

CSH uses a *settings approach* to health that is based on a redefinition and repositioning of health promotion proposed by the Ottawa Charter for Health Promotion (1986). The Ottawa Charter was written at a time when health promotion was shifting focus from modification of individual risk factors and risk behaviours to addressing the determinants of health. This new focus moved beyond the biomedical lens that centered the health care system to make a clear commitment to social reform and health equity (Kickbusch, 2003, p. 385). The strategy behind the settings approach to health was to collaborate with sectors outside of hospitals and other institutions that are part of the traditional health care system. This includes institutions such as

municipal governments, businesses, prisons and schools. In so doing, a more holistic and context-sensitive approach to health could be promoted (Kickbusch, 2003).

There have been numerous references to the challenges posed to those who want to understand, demonstrate, implement or evaluate CSH. For example, Rowling and Jeffreys (2006) state,

> While health promotion practice has altered in the last decade or two, there has not been an equivalent development in research design and evaluation methods to match this shift, a shift that acknowledges the multiplicity of factors that influence health and therefore the multi-strategic action needed to address it. (p.708)

Reframing health promotion to align with systems thinking and complexity helped to align health promotion to school development and cross the traditional boundaries between education and health objectives. Systems thinking had led to a better understanding about what it takes to implement and evaluate school-based health promotion (Bond et al., 2004; Butler et al., 2010; Keshavarz et al., 2010). The emphasis now is on the broad social context of the school and how organizational factors enable or create barriers to change within schools. As argued by Samdal and Rowling, "health promoting school builds on the notion that schools should develop their change processes based on their individual needs and capacity, involving all relevant stakeholders" (Samdal and Rowling, 2013, p. 149).

When school food is understood as a system in need of transformation, research can be designed to help propel that transformation. Such a design was used by Rojas et al. (2011), who relied on collaboration among school food system stakeholders to help them identify opportunities to generate knowledge, and to devise and implement locally appropriate action to create desired change. Black et al. (2015), in their development of the SFEAT, relied on the

model of CSH as a heuristic to identify systems-level factors that enabled or inhibited school food system transformation. They contribute to what they called an emerging field of school food system research and action. A field which they describe as lacking methods to evaluate and engage with the school food system. They indicate as well that this field lacks assessment tools and language to describe multiple domains where schools take action and which allow for examination of how needs and opportunities progress over time.

The insight from CSH research on understanding school food systems is that, "implementation and evaluation strategies are needed that will capture the synergistic interaction and impact of multiple interdependent interventions and systems operating at different levels and spheres within the context of specific settings" (Dooris & Barry, 2013, p. 17). The defining features of school food discussed in the previous chapter -school food is political, varies according to context and requires an interdisciplinary approach to understanding- led to the justification for using an *ecological praxis* in school food research. Such a praxis helped me address issues of school food in ways that will more likely enhance the possibility of a revolution in the Canadian school food system.

Poland et al. (2011) define the concept of ecological praxis when describing how the field of health promotion can work towards changing settings. They say the field must move

> closer to critiquing existing social structures that impact environmental health and justice, and [strive] for sociological sophistication about how contemporary social relations resist an ecological worldview and lifestyle—both of which are preconditions for 'a sense of the possible'. (Poland et al., 2011, p.209)

The process of understanding school food -through a systems lens- is the potential basis for an ecological praxis that can help to repair the distance between an un-ecological and an

ecological approach to school food. Just as the school garden literature revealed how gardens can act as a critical lens through which schools can develop interconnections between social, health and environmental outcomes; viewing school food as a system can help to inform our broader understanding of school food and how school food interconnects to other fields, well beyond the school itself.

The ecological praxis for this study of the school food system draws on insight from place-based education which is a response to the critique that contemporary school reform often takes little notice of place and context. Gruenewald (2003) describes how place-based education asks educators to

> extend our notions of pedagogy and accountability outward toward places. Thus extended, pedagogy becomes more relevant to the lived experience of students and teachers, and accountability is reconceptualized so that places matter to educators, students and citizens in tangible ways. (p.620)

The shift in accountability (proposed by approaches to place-based education) responds to a shift towards holistic knowledge that is needed to solve both ecological and social problems (Haluza-Delay, 2021). The connection between school health promotion, school food system transformation and place-based education lies in the joint necessity to challenge existing systems (Karavoltsou, 2015).

For this thesis, I propose an interdisciplinary consideration of the school food system defined by exploring synergies between the following interrelated terms: critical food pedagogy (a term from food studies), place-based education (a term from education) and CSH (a term from health promotion). Each of these concepts illustrates the mechanics by which, under a particular set of conditions such as a political climate that favours the industrialization of the food system,

school food systems can be either broken or transformed. Focusing on the interconnectedness of

the processes that define these terms is both an acknowledgement of current fragmentation in

thinking about school food transformation and an attempt to foment interdisciplinary

consideration of the system of school food. Applying a critical lens to the school food system

requires an interdisciplinary approach to learn about and identify the multiple intertangled

systems that define school food (Hinrichs, 2010).

In Table 3.1 below, I show how these three currently mainly dissociated, but quite

popular terms (critical food pedagogy, place-based education and CSH) all connect to each other.

Each term is a response to efforts to confront the barriers of the current system in achieving

healthy food systems (critical food pedagogy), social and ecologically meaningful education

systems (place-based education), and holistically healthful school environments (CSH).

Table 3.1

Interdisciplinary consideration of the school food system transformation: An ecological praxis

Terms related to school food system transformation	Systems thinking principles (Swanson et al., 2012)		
	Iterative learning (developing out of response to a critique)	Collaborative vision	Innovative approach
Confronting the food system through **critical food pedagogy**	Industrial, mechanistic consideration of food	Interconnected system of food	Relevance of traditional knowledge and social connections
Confronting the education system through **place-based education**	Industrial model of learning	Connection to local places, social and environmental justice as pedagogy	Critically examine the outdated cultural logic present in the school system
Confronting the health system through **Comprehensive School Health**	Reductive, biomedical approach to health	Settings, social determinants	Interdisciplinary thinking integral to change in settings

Ongoing conversations suggest that knowing these systems depends on an

epistemological shift towards socio-ecological understanding. To improve how the current

system functions requires understanding the limits of knowledge built into that system of

understanding. In Chapter Two, I introduced the idea of a revolution in our understanding of and

how we address school food policy (Morgan & Sonnino, 2008; Oostindjer et al., 2017; Rayner & Lang, 2012; Robert & Weaver-Hightower, 2011). This evolution in understanding food policy coincides with an evolution in public health where food is not viewed just in terms of nutrition, but also in terms of its material, biological, social and cultural dimensions: why, when, what and how people eat and how all these dimensions operate in food systems. I asserted that for building this understanding it was necessary to apply systems thinking.

There is an interesting connection between systems thinking in public health and the province of NL. Ecological public health theorists including Poland et al. (2011) and Rayner and Lang (2012) refer to research which studied the results of the collapse of the NL cod fishery to help visualize the complex relationship between ecology and health (Dolan et al., 2005; Finlayson & McCay, 1998; Rayner & Lang, 2012). Poland et al. refer to the concept of "ecosystem resilience" in the context of the close extinction of the northern cod. The closure of the NL cod fishery helped to unveil the "intricate and complex interrelationships among environmental change, economic restructuring, ecosystem health and human health as these relate to food production and availability" (Turner et al., 2007, p. 2). Insight from social scientists in reference to this ecological disaster led to the adoption of a social-ecological framework that emphasized the impact that ecosystem failure had on the restructuring of communities (Dolan et al., 2005). Dolan et al. (2005) suggest the need for a variety of methods, actors, knowledge systems and scales of investigation to understand and monitor the relationship between restructuring and the health of people, communities and the environment.

Exploration of the way these systemic factors connect to a study of school food in NL does not yet exist. However, there is ample justification to explore systemic factors. The culmination of factors that characterize unhealthy school food systems is in many cases,

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miniaturized school versions of the same factors that characterize broader unhealthy food systems. In this light, a critical food systems view, such has been applied to the fisheries by Levkoe et al. (2017), provides insight into this study of the school food system in NL. Levkoe et al. critique the predominant tendency to approach the fishery from a resourcist perspective which tends to separate humans from nature, commodify nature, rely mainly on scientists and managers as independent and objective experts, rely on a science that treats the world as predictable and controllable, and relies on reductionism (Levkoe et al., 2017).

Levkoe et al. suggest that seeing the fishery through a "fish as food lens" helps to address power imbalances that favour markets, corporate interests and global financial institutions. They suggest that a shift in thinking from fish as commodity to fish as food can help people see the social and ecological aspects of fisheries as interconnected. The need to change approaches to knowledge development (to put on a different lens) is an ongoing theme in food studies. Martin et al. (2016) describe how

> biomedical and holistic approaches are fundamentally and epistemologically different. Practitioners who strive for evidence-based decision making in health care often value scientific data (neutral and generalizable) over socially-based knowledge (context specific and difficult to replicate). However, a reliance on generalizable evidence may delegitimize those who criticize accepted practices. (p. 176)

This epistemological shift is an important concept to justify the use of systems thinking within this dissertation.

3.2 Operationalizing Systems Thinking for this Investigation

While systems thinking has been deemed an ambiguous term by Cabrera, it continues to be broadly used to describe an alternative way of thinking necessary to confront the complex

challenges facing the Earth at this time (Cabrera, 2006). Systems thinking provides a way to describe and respond to the way in which multilayered and interdependent processes produce patterns within health, education and food systems (Hinrichs, 2010; Dooris & Barry, 2013; Haggis, 2010; McIsaac et al., 2015c; McIsaac et al., 2019; Swanson et al., 2012).

Cabrera lists three principles of systems thinking that most people agree on. It involves multiple perspectives, it involves putting things in context and it involves a boundary critique. Boundary critique refers to the process of reconsidering assumptions about what factors need to be considered as part of the system. Cabrera's (2006) three principles of systems thinking can be further operationalized by the tools of systems thinking as described by Swanson et al. (2012). The first tool is ongoing iterative learning for systems transformation. The second is that systems transformation depends on collaboration across disciplines, sectors and organizations. The third principle is that innovative approaches and transformational leadership are required for systems transformation (Swanson et al., 2012). The connection between the principles and tools of systems change is summarized in Table 3.2.

Table 3. 2

Elements of systems change principles in research process

Characteristics of the topic: school food as a 'system'	Principles of systems thinking (Cabrera, 2006)	Tools for transformational change within systems (Swanson et al., 2012)	Responsive Research Process
Complex	Learning in context	Ongoing iterative learning	Emergent design/ continuous learning cycle
Interdisciplinary	Multiple perspectives	Collaboration across disciplines, sectors, and organizations	Interdisciplinary frame of problem and investigation of problem: multiple methods, multiple stakeholders
Requiring innovation: current methods and tools not solving problem?	Boundary critique	Innovative approach/Transformational Leadership	Challenging assumptions about how we study school food. Questioning definitions of school food.

In the following section, I will describe how my research process was guided by these principles of systems change.

3.2.1 Ongoing iterative learning

This study developed as a process with an unfolding methodology illustrated in Figure 3.1.
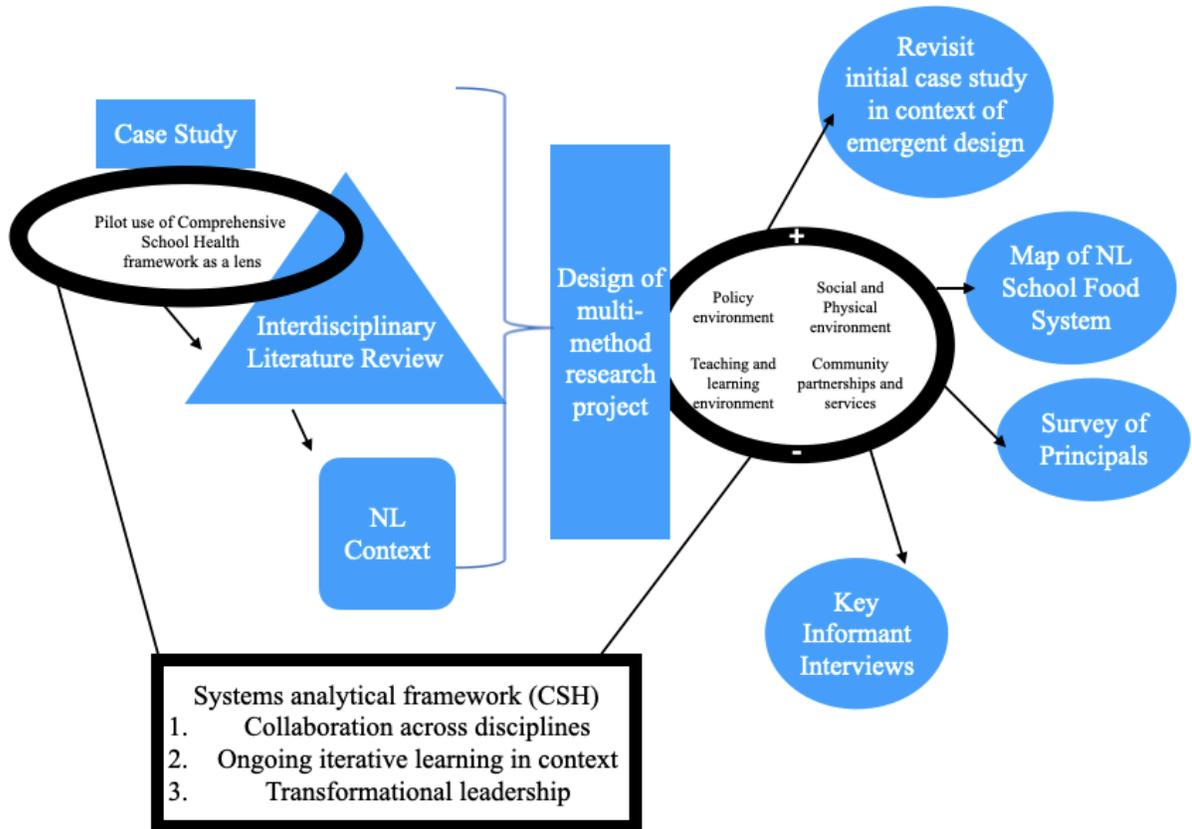
Figure 3.1

Research process

This research began with a case study of 14 individuals involved with a school greenhouse in

2014. The case study was based on an ecological framework to enable documentation of systems

benefits of school gardens (Ozer, 2007). Taking this broad perspective led to an understanding of

how a complex interaction of factors outlined by the CSH framework could bring to light the

transformative impact of the school greenhouse. From the case study, I came to understand

school food through a broader interdisciplinary lens. It was at this point in my research process

that I expanded the scope from a study of school gardens to a broader investigation of the school

food system. After the case study was completed, I submitted a proposal to SSHRC to assess the

system of school food by conducting both a province wide survey and key informant interviews.

The rationale for using different methods was to gain access to multiple perspectives in

answering the research questions. Guevel et al. (2015) propose using multiple methods methodologies to better increase the quality of school health research and to resolve particular issues arising from initiatives in school health promotion. Using more than one method helps to produce a more complete picture of the phenomena being studied. Thus, the multiple methods in this dissertation helped to probe the system from multiple angles and piece together the system of school food. Examining interconnections among the multiple methods while continually connecting to the evolving literature and context provided new knowledge about the NL system of school food (the contribution of this research).

Throughout the research process, the conditions of my field were constantly changing. New projects and partnerships were forming amongst local stakeholders; new information about school food was being released by the provincial government, national stakeholders and academics. My attempts to create responsive research that could fuel school food system understanding and transformation was a work in progress. As I worked towards meeting my academic obligations for developing the research project and uncovering the terrain, things were always changing on the ground. As a result of being immersed in this research field for longer than originally anticipated (2012-2021) I developed a deeper and much more dynamic understanding of the topic and my place in it. In qualitative investigations the length of time in the field is considered an asset to attain an understanding of the context, how the context changes over time and how these processes impact the questions being asked (Maxwell, 2012).

After an unexpectedly long research process, I am finally able to make all the links and put all the pieces together. This has involved visualizing the entire research process as a model of learning about the school food system involving building an understanding of knowledge, programs, and their development in place. This model of research is interactive (Maxwell, 2012)

and views the components of the research project, including goals, conceptual framework, research questions, methods and validity, as an interacting system. Each component is tied to the others in ongoing and reciprocal influence. Viewing the system, whether it be the conceptual framework or the subject of school food as a process, emphasizes learning about the object of investigation as it moves through time. Thus, the research process in which I was involved can be seen as a continual iterative learning cycle to document the story of the complexity of the school food system in order to render that knowledge usable for systems change.

Cilliers asserts that the "only ethical basis for intervention in complex social systems was by those who were embedded within those self-same systems" (as referenced in Byrne & Callaghan, 2014, p. 259). I have been personally engaged in the school food system, as have most of the participants in this study. Thus a core principle of this work is to be able to learn from studying and being engaged in the system: how it works and how this understanding can be applied to help build together a more healthy sustainable school food system. This thinking directly connects to the methodology of phronetic social science which offers practical knowledge as the key to making social science matter.

Traditionally the researcher and the quality of the research have been judged on the basis of the level of objectivity maintained throughout the research process. In phronetic social science, proximity with the setting constitutes a prerequisite for understanding (Flyvbjerg, 2001). Knowledge is developed in collaboration with local people and places. Validity comes when the knowledge generated helps to solve problems in real situations. Phronetic social scientists attempt to "develop their partial answers to the questions; such answers would contribute to the ongoing social dialogue about the problems and risks we face and how things may be done differently" (Flyvbjerg, 2001, p. 61).

3.2.2 Collaboration across disciplines, sectors and organizations.

The key principle of collaboration in systems research is embodied in my conceptual

framework as an interdisciplinary vision of the actors and systems that are implicated in the

discussions of school food. In my review of the literature, I explored research on school food

systems, food policy, school gardens, school health promotion, public-health theory and systems

thinking (or ecological literacy). I sought to expound on the links among these topics and

attempted to combine narratives in such a way that might allow increased synchronization of

actions in the school food system. Combining literature from food, health and educational

systems for this study of a Canadian school food system positions this research within an

ongoing paradigm shift in how we view these interacting social systems and how we respond to

negative and persistent trends in these systems. To connect these multiple disciplines, I focus on

the CSH framework. The CSH framework promotes collaborative culture change and systems

change in schools, and is integral to the present policy direction in NL and Canada (Government

of Newfoundland and Labrador, 2018; Joint Consortium for School Health, 2021a).

3.2.3 Innovative approach/Transformational leadership.

Swanson et al. defined "transformational leadership" as "challenging basic assumptions;

mobilizing around a shared vision of equity and efficiency; and elevating the values, vision,

mission and morals of all stakeholders . . ." (2012, p. iv56). In this section, I will discuss how my

actions in the field of study aspired towards "transformational leadership" in research practice.

At the start of this project I observed that school food in the province of Newfoundland and

Labrador was not yet well connected to conversations and actions seen around the world and

across the country which connected school food to health, sustainability and food-system goals.

This observation was based on my involvement with different organizations that were engaged in

conversations around building healthy sustainable food systems. My knowledge of the school environment was also informed from having just finished my Bachelor of Education and internship in the school system. At that time, there was a large gulf between optimistic representations of school food as seen in various news publications and case studies, and my personal experience of what I saw on the ground (prior to conducting my research). For this reason, I saw my ideas about possibilities for the school food system transformation in NL as innovative when compared with what I found to be actually occurring on the ground—or at least this was my initial assumption. These early observations about the NL school food system were the beginnings of an ecological praxis.

The next chapter (Chapter Four) will provide an overview about what is known and not known about school food within the context of the province of Newfoundland and Labrador. This chapter provides necessary context and background to be able to answer the question of what current policies and programs exist in the NL school food system. The subsequent chapters (Chapters Five to Seven) each focus on a separate method of investigation which combine to help to fill the gaps in understanding about school food as described within the following chapter.

Chapter Four: Application of an Ecological Praxis in Exploration of the Newfoundland and Labrador School Food Context

In Chapter Two, three phases of school food were described (Oostindjer et al., 2017) to help articulate conceptual and material shifts in school food systems over time. In the following chapter, I will draw from Oostindjer et al.'s three phases framework of school food to provide an overview of what is known, and not known, about the history of the school food system in NL and its relationship to health, education and sustainability.

The tracing of a history of school food cannot be separated from the evolution and history of the education system itself. Starting with schools, of course, ignores Indigenous and other traditions that predate the evolution of schools and the school system as it exists today. This exclusion marks a limitation of my current work. I wish to acknowledge this discussion does not adequately address the history of colonialism, the impact on Indigenous education and the informal and non-formal learning that may occur among contemporary Indigenous people today.

4.1 Phase I: Initial Concerns about School Food in NL

The model of the phases of school food discussed in Chapter Two is based on Western industrialized countries (Oostindjer et al., 2017). Regardless of the absence of a national school food program, many actions and discussions around school food in this country do seem to align with the school food phases and the broader nutrition transition. A review of existing literature will help to illustrate how NL falls into the same general pattern as that described in the model.

The province of Newfoundland and Labrador (NL) has been described as coming late to the 20th century (McClurg, 2019). One possible reason for this is the unique way in which the imperialist British colonialists attempted to prevent settlement so that NL would remain a seasonal station, whose main purpose was to be the setting of a profitable migratory fishery

(Kealey, 2007; O'Flaherty, 2005; Turner et al., 2007). Yet settlers remained and, "…this imperial context helped shape the direction of health care and approach to dietary deficiency disease until the 1940s when Newfoundland began to 'modernize' and became a part of Canada in 1949." (Kealey, 2007, p. 178). The state of NL in the 1940s has been compared to the Virgin Islands, where ruling classes steadily opposed political liberty and social and economic betterment for the population. Kealey discusses the interests in nutrition, diet and dietary diseases by health and other officials throughout the first half of the 1900s in NL. Much of this early interest was connected to the Grenfell Medical Mission during that time. The Mission was guided by a strong sense of Christian stewardship to serve northern Newfoundland and coastal Labrador and concerns with endemic malnutrition and dietary deficiencies. The activities spurred on by the Mission are one of the earliest recorded forms of school food provisioning in this place. At this time many people relied on the truck system, depending on the sale of fish to buy supplies to last through the winter. Much of the population was indebted and vulnerable. Malnutrition and dietary deficiency were commonly reported. Kealey notes Sir Wilfred Grenfell's attempts to encourage food sustainability in the form of gardens and a school lunch program, which Kealey calls the first of its kind on the island. Criswell (1933) describes some school food activities connected to her work with the Grenfell Mission in a small Labrador community:[1]

> Our food problem is not as difficult as might be imagined. We use the many varieties of
>
> dried fruits and vegetables, with a plentiful supply of potatoes, turnips, carrots, parsnips,
>
> onions and beets, which are kept through the winter in the vegetable storehouse . . .

---

[1] Criswell was referring to her work at Lockwood School. I want to acknowledge that Lockwood was one of the province's residential schools for Indigenous children and that the children who attended this school experienced serious abuse. The Government of Canada acknowledged this abuse and together with the survivors began a process for truth and reconciliation.

Barrels of [these] berries are brought into the school in the fall and canned and stored for

winter use. Cod and salmon are used fresh during the summer months and salted and

dried for winter use . . . The brook freezes solid only during the coldest weather. At other

times the school boys enjoy fishing through the ice for the next day's dinner. Venison,

partridge, rabbits, an occasional seal and often a black bear provide fresh meat. In the

spring and fall we feast on wild duck and wild geese . . . Gardens have been built around

each school, and enough vegetables can be grown to supply the needs for the summer and

early fall. (p.1089)

Criswell's underestimation of the food problem does not fit well with the documentation

of persistent nutritional problems in NL including by the Mission staff (Kealey, 2007). Kealey

notes a flurry of interest in the issue of malnutrition in the form of nutrition councils established

in 1943 and publications in the 1940s in the Canadian Medical Journal (1945). She notes that in

1947, cod liver oil and cocoa-milk powder were distributed to schools and that this continued

until 1968.

Kealey (2007) describes the different responses to nutritional concerns. Some people

focused on the link between nutritional diseases and poverty and recommended economic

reforms and others focused on the great potential for educating people about nutrition and for

increasing access to essential vitamins lacking in the diet. The prevalence of information about

malnutrition in Newfoundland and Labrador in the first half of the 20th century contradicts

Oostindjer's (2017) observations that in Phase I, diets significantly improved in high-income

countries. It was however not until 1949 that the province of Newfoundland and Labrador joined

Canada and began, "…moving along the path of modernization" (Kealy, 2007, p.189).

4.2 Phase II: Observed Trends in School Food Research in Newfoundland and Labrador

Kealey describes how gradually towards the 1960s and 1970s nutritional concerns changed from a focus on dietary deficiency diseases to a growing awareness of the unhealthy foods children were eating. Kealey states that government increasingly assumed a lead role in establishing policies and programs that would improve health. This involved turning more to nutritionists as professional experts. In the 1960s and 1970s, a number of studies focused on the food habits of school children (Hanrahan & Ewtushik, 2001; Kealey, 2007). In 1967 a school beverage survey was conducted in Newfoundland. Dawson (1970 p. 257) expresses concern when they discovered that "many children were missing breakfast" and that consumption of soft drinks and "poor choices of recess snacks and poor lunches at schools" were commonplace. Dawson describes how the process of building centralized schools increased the need for and interest in school meal services.

Hanrahan and Ewtushik's (2001) annotated bibliography provides summaries of 170 writings on foodways and nutrition in Newfoundland and Labrador. Their annotated bibliography contains references to school food, research studies and reports that span from the 1960s to the late 1990s. The need for nutrition and dietetic professionals to advocate strongly on behalf of poorly nourished children was made clear throughout the entries. There are documents from the Food and Nutrition Information Coalition (1978), the NL Dietetic Association (1995, 1998), and the School Children's Food Foundation (renamed later as KES) (1999). Notably, among the entries is a strongly worded position paper from the Newfoundland Teachers' Association (1976). The paper urges the integration of healthy food into school curricula, reinforced with good quality school food services (Hanrahan & Ewtushik, 2001). The

Newfoundland Teachers'Association's paper also recommended that schools desist from selling

foods with limited nutritional value and study the cost of subsidizing healthy food.

In 2001, the Coalition of School Nutrition (the coalition) conducted a survey of food and

nutrition policies in schools. The Coalition had two funding partners, The School Children's

Food Foundation of Newfoundland and Labrador, and The Newfoundland and Labrador School

Milk Foundation. There were several cooperating partners at that time: the Dietitians of

Newfoundland and Labrador, the Department of Education, the Department of Health and

Community Services (DHCS), the Federation of School Councils, Community Health St. John's

Region, Community Health Western Region, Newfoundland and Labrador Teachers'

Association, Newfoundland and Labrador School Boards Association. The coalition survey was

endorsed by the Department of Education and conducted by a private research firm. Seventy-two

percent of the province's schools participated. The survey was extensive and asked about:

- food delivery in schools (including cafeterias, canteens, vending machines, fundraising);

- feeding programs (breakfast, snack and or lunch programs);

- policies;

- food-preparation facilities;

- whether food was addressed sufficiently in the curriculum; and,

- what concerns principals had with regard to children's nutrition.

The survey found that almost half the food served in school was not nutritious. "It is clear that

students are not eating as well as they should in our schools and . . . our children need to change

what they're eating" (Coalition for School Nutrition, 2001, p. 5).

These findings were used to spur on the process of implementing the province-wide

adoption of the School Food Guidelines (SFG) in 2006. The SFG were to provide guidance to

nutrition policies to be enacted and enforced by schools. The SFG classified foods into three different categories including: (1) serve most, (2) serve moderately and (3) foods that are not included in the SFG. The guidelines stated, "all foods served and/or sold in school must come from the 'serve most and serve moderately' categories, with the majority of items (greater than 50%) from the 'serve most' category for each group on a daily basis" (Government of Newfoundland and Labrador, 2009, p. 11).

The introduction of the SFG coincided with the development of the 2004 Healthy Students Healthy Schools (HSHS) initiative. While these actions were, in theory, the beginning of a comprehensive or systems approach to school food in the province, I consider this phase in the province's approach to school food as part of phase II. My logic for making this phase II placement was that school authority concerns over school food were still focused on the nutritional quality of food and still did not consider broader questions of the inadequacy of efforts to resolve "the current societal and individual challenges of the reduction of obesity and malnutrition in a sustainable food context" (Oostindjer et al., 2017, p. 3944). The HSHS initiative was informed by the CSH model and connected to the Joint Consortium for School Health (JCSH). Partners of HSHS included the DHCS and the Department of Education (now the Department of Education and Early Childhood Development, DEECD). Other entities involved in implementing HSHS are illustrated in Figure 4.1. HSHS was a priority in the Provincial Wellness Plan (2006-2008) and linked to the RHAs, school districts, regional wellness coalitions and other school health community groups and organizations (Newfoundland and Labrador Centre for Health Information, 2014). A key action item of HSHS was to introduce and support the SFG in 2006.
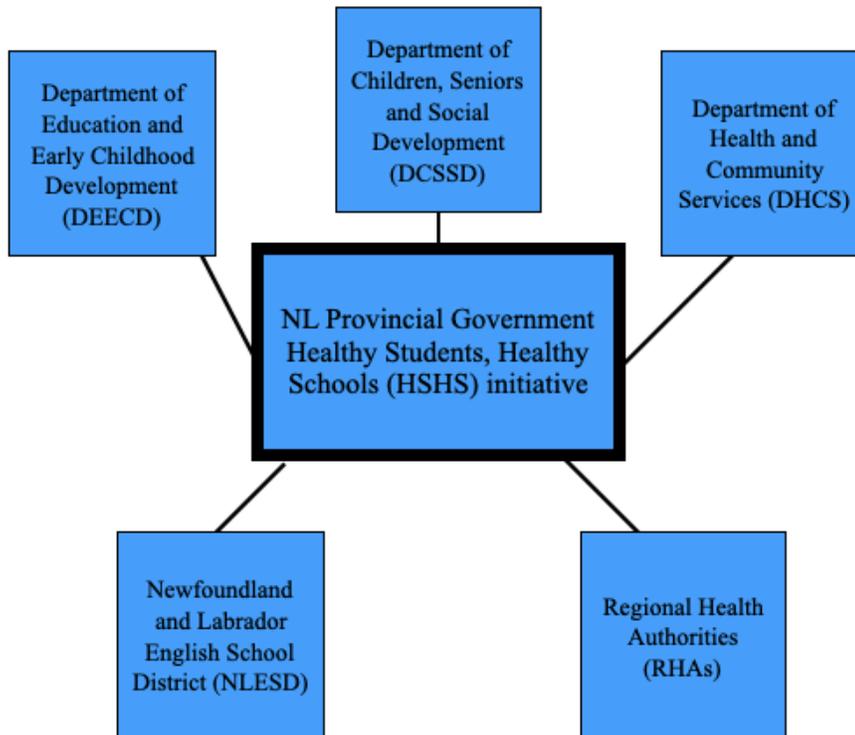
Figure 4.1

NL Healthy Students, Healthy Schools

In 2007, HSHS conducted a needs-assessment survey to determine (a) how the government could support schools to create a healthier school environment, (b) the degree to which schools were providing healthy options, and (c) the barriers the schools faced (Government of Newfoundland and Labrador, 2007). The survey was sent out to all public schools in the province; 277 of the 278 schools responded. Without giving a rationale for this decision, the researchers conducting the survey consciously excluded "Native and institutional schools" (Government of Newfoundland and Labrador, 2007, p. 2). As such, the unique perspectives and insight from these schools is absent in the summarized findings from the Needs

Assessment (see next section). Permission to use the data from the needs assessment was granted in 2016 from the Healthy Living Division of the Department of Seniors, Wellness and Social Development. The survey included questions on food preparation, food service facilities, food offerings and operations and also included broader questions on health-promotion efforts in the school environment.

The 2001 coalition survey and the 2007 needs assessment provide extensive information about the NL school food system both in the time leading up to the implementation of the SFG and the time immediately after the introduction of the SFG. They document the changing infrastructure and the nature of school food throughout the 2000s. Reports from each of these provincial surveys contain over one-hundred pages of results. A summary of their findings is included in Appendix A. This information allows for a comparative analysis between the state of affairs in 2001/2007 and that in 2017. This comparison can be found in Chapter Six.

Since 2017, further information about the school food system has emerged which I summarize below. See also the timeline of this more recently published information listed in the following Table 4.1.

Table 4.1

Timeline of recently published information

2017	Premier's Task Force on Improving Educational Outcomes
2017	Updates for Environment Policy Index
2019	Release of report of the Wellness Review
2019	Auditor General's report

The Premier's Task Force on Improving Educational Outcomes reported in 2017 on the HSHS initiative saying that "a series of departmental reorganizations, restructuring and personnel changes fractured the initiative, despite some efforts to remain committed" (Collins et

al., 2017, p. 29). In addition, the task force notes that "systemic barriers and a lack of collaboration" impeded educational outcomes. The task force suggests a need for more consistent and available recording and sharing of student health data. The authors say: "DEECD [Department of Early Education and Childhood Development], the school districts and schools all have different systems for collecting, analyzing and reporting information about students' participation, health, and academic performance" (Collins et al., 2017, p. 20).

Another issue raised by the task force was that a healthy eating policy had yet to be consistently implemented province-wide by the newly consolidated NL English School District. The task force advises that education and health needed to work better together to support students physically, emotionally and mentally. In a 2018 update on the recommendations suggested by the task force, the DEECD indicates that plans were in effect to implement the CSH framework developed by the JCSH (Government of Newfoundland and Labrador, 2018)

The Healthy Food Environment Policy Index (EPI) (International Network for Food and Obesity/Non-Communicable Diseases Research, Monitoring and Action Support (INFORMAS, 2017) examines the state of food-environment policy in Canada compared to internationally established good-food practices. The EPI produced a report on policies in the province of NL. The purpose of the EPI was to evaluate policies and actions that federal, provincial and territorial governments were taking to create a healthier food environment in Canada. The research was justified on the basis of an understanding that the Canadian food environment is dominated by nutrient-poor, energy-dense food items, which are increasingly more accessible, available at a lower cost and more heavily promoted than their healthy food counterparts. This situation is seen to contribute to poor dietary habits among Canadians and to the problem that an unhealthy diet is

now the leading behavioral risk factor for death in Canada. Their best practice statement states that the

> government ensures that there are clear, consistent policies (including nutrition standards) . . . for food service activities (canteens, food at events, fundraising, promotions, vending machines etc.) to provide and promote healthy food choices in schools" (INFORMAS, 2017, p. 25).

In contrast, the EPI reports that the NL SFG "are not mandatory or legislated, but serve as guidelines to form the basis for school district policies that are developed" (INFORMAS, 2017, p. 25)

The Wellness Review was conducted by the Newfoundland and Labrador Centre for Health Information (NLCHI) (Newfoundland and Labrador Centre for Health Information, 2014). To the best of my knowledge, the Wellness Review (2014) was not made public until 2019. The review was based on key informant interviews, site visits and document reviews. According to the review, the SFG supported by HSHS provides an effective model for pursuing health promotion in the education sector.

The Auditor General's Report on healthy eating in schools, covered the period from September 1, 2017 to March 31, 2018 (Government of Newfoundland and Labrador Office of the Auditor General, 2019). The report's findings are based on an audit of food and beverages in the Newfoundland and Labrador English School District (NLESD)'s Avalon and Central regions, which are home to 66% of the province's schools and 78% of the total provincial student population. The audit encompassed an examination of lunch, canteen and vending machine menus from eighty-four schools. Using the SFG to determine whether these menus met the guidelines, they find only a small percentage of food available in schools was in the "serve most"

(highly recommended food) category: lunch, 27%; canteen menus, 30%; food in vending machines, 0%; beverages, 92%. (Government of Newfoundland and Labrador Office of the Auditor General, 2019, p. 8). These findings are shown in Figure 4.2.
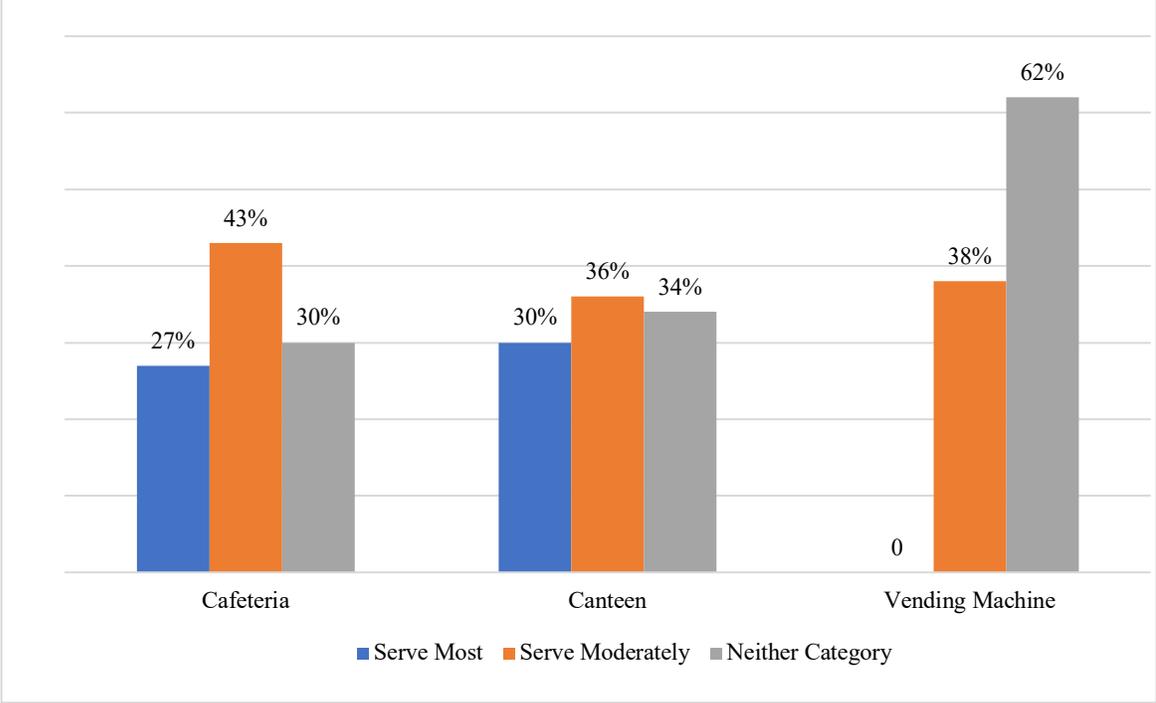
Figure 4. 2

Percentage of foods served in schools according to SFG (2019 Auditor General's report)

The guidelines stated that all items served or sold at school were required to come from either the "serve most" or "serve moderately" categories. The Auditor General's report found that 30% of items on the lunch menus and 34% of items on canteen menus were from the "neither category." Most schools (105 of 118) in Avalon and Central regions offered lunch through an external school food provider. Schools where food and beverage services were provided by internal resources (parent volunteers) had a higher percentage of lunch menu items in the neither category (food not included in the guidelines). The auditor general requested sales data from the school district for food items sold by one school food provider who operated in 25

schools from September to December, 2017. They found only 8% of items purchased were from

"serve most" and 36% were from the "neither" category. Similar to the 2017 Premier's Task

Force on Educational Outcomes, the auditor's report also noted how the newly amalgamated

school board has yet to adopt a province-wide healthy eating policy and that "the lack of a

current District-wide policy may result in decreased awareness of the District's healthy eating

policy, including specific school accountabilities, and thus results in inconsistent processes and

results for healthy eating amongst schools" (Government of Newfoundland and Labrador Office

of the Auditor General, 2019, p. 13). The Auditor General's report found that most schools could

not locate or did not have a contract with their external food provider and that the lack of a

current and signed contract increased the risk of uncertainty regarding the food provider's

requirement to follow the guidelines. Of 36 principals who were interviewed only 58% were

aware that there was a nutrition policy in place in the school. One third of the principals were

unaware that schools were required by the district to have a regional nutritionist review and

approve the food provider menu.

     The Auditor General's Report also assessed menu changes in 105 schools. The report's

researchers assessed 691 of 781 items added to lunch menus and found that 21% of these items

came from the "neither" category. Changes, for example, included over 20 additions to the

original menu, including baked mozza sticks [elongated pieces of battered or breaded

mozzarella] and ice cream, both of which come from the "neither" category. It was found that

"the district did not gather any statistics on food and beverages sold and/or served in schools or

any other healthy eating initiative" (Government of Newfoundland and Labrador Office of the

Auditor General, 2019, p. 14). The Auditor General's report (2019) notes a seeming lack of

interest at the NLESD regarding foods being served:

For one of the largest school food providers, a District official indicated that they did not see a need to recommend a menu review, as the school food provider was quite aware of the Guidelines and they had no concern about whether the school food provider was adequately following the Guidelines . . . The audit test did reveal however that this school food provider's menus did not meet the Guidelines. (p.17)

4.2.1 Summary of trends

To summarize, background research into the recent history of school food programs and policies in NL reveals how understanding and intervention regarding school food in NL is consistent with Oostindjer's 'Phase II' (Oostindjer et al., 2017). The information collected has focused more on the quality of food at school rather than providing insight into cultural, societal, environmental trends that could have an impact on the effectiveness of school food programs.

The information contained in the Auditor General's report, in addition to the other recent documents summarized above, describe sustained efforts to enhance the school food system with limited success. It should also be noted that the Auditor General's report did not document the situation in schools in every region of the province. This was a significant shortcoming given the regional variability found in the 2001 and 2007 survey data. The Auditor General's report was focused on food quality which is reflective of Phase II of school food. However, the report also provided new insight into the context of school food contracts, the roles of the school board and principals, and the observed impact of board consolidation on policy uptake. The report lacks what I call a critical understanding of the social and sustainability aspects of food practices. Such oversight unfortunately has had a negative influence on the development of beneficial food practices in NL schools.

Below I will outline key trends found in this review of the NL school food system literature. To organize the information, I use McKenna's (2010) five ways to support healthy food (discussed in Chapter Two).

- Food and drinks available (See Appendix A for further information). There is evidence that feeding children at school has been recognized as an important public health strategy. As time has passed, it has become more common for breakfast programs to be offered in schools. The introduction of the SFG was a milestone moment in the history of school food in the province. A series of surveys and reports over the past twenty years have demonstrated that there is immense variability between schools regarding what food and drinks are available. There is also indication that the foods available to schools are changing as is our understanding of how to assess the healthfulness of these foods. There seems to be a trend towards the outsourcing of foods served in schools although schools do still play a major role in supporting the province's breakfast program. There has been an increase in schools with allergy policies. The recent Auditor General's report reveals that the majority of schools offer foods that do not meet the SFG.

- Food environment. Understanding of the food environment has shifted yet school food policies and programs are slow to adapt to the shift in this province. A most recent definition of the food environment provided by the EPI suggests:

  > The food environment is comprised of all of the factors that influence food choices and dietary habits. The definition of the food environment is broad, and includes the physical, economic, political and sociocultural surroundings, opportunities and conditions that can all influence food choices and, ultimately, health. (INFORMAS, 2017, p.3)

- Health education. Early health education regarding food in schools is framed as a public health intervention to reduce undernourishment. More recent surveys and reports highlight an observation from schools that health education is needed both in communities and schools. A large minority of principals (~40%) in both 2001 and 2007 described a need for more food and nutrition in the curriculum. The Premier's Task Force on Improving Educational Outcomes observed that health was not a priority subject and was often dropped to accommodate other activities. Different regions in the province have different access to health educators.

- Health services. The 21st century has seen large shifts in the organization of public health and public education. There are regional differences in services available to schools regarding school food and regional differences in food environments. The Auditor General's report described how school principals were unaware of the SFG and the supports available to them. In 2007, a majority of schools had a committee in place to support healthy schools and schools reported on the importance of sustaining support for schools to promote health. More recent reports—the Wellness Review and the premier's task force—produced conflicting perspectives on the effectiveness of promoting health in schools.

- Family/community outreach. Reports on the theme that families and communities were integral to improving the school food situation were consistent. In spite of variation across the province, there was also evidence that families and communities were heavily involved in supporting the delivery of food programs in schools.

- Other. While longstanding insight into how to achieve healthy school food environments has existed, barriers continued to operate. In 1976, the Teacher's Association

recommended that schools desist from selling foods with limited nutritional value and study the cost of subsidizing healthy food. In 2001 and 2007, there was clear input from schools of what schools need to support healthy eating. In the qualitative answers from the 2007 needs assessment, principals communicate how a broader resourcing of schools is a key lever in supporting health promotion initiatives. The accumulation of information without concrete results suggests there is a bigger problem or issue that is not being addressed. There is a repetitious cycle of research and recommendations with little, if any, actual change.

The shift towards a broader understanding of the food environment blurs the distinction between the food environment and McKenna's other distinct policy options to improve school food (i.e. food and drinks available, health services, community outreach, etc.). All of the options intersect with larger food system features that characterize the 21st century. This review of the literature about the NL school food system helps to demonstrate a lack of understanding about how broader features of food systems interlock with the NL school food system and come to play a role in defining or restricting attempts at improving this environment.

Considering the diversity between regions in the province and between schools, and considering the changes in the way we conceptualize factors that are included in a 'food environment', it is increasingly challenging to present a succinct picture of the school food environment. However, it does remain clear that schools in this province report sustained barriers to serving healthy food in schools.

4.3 Broad Trends in the NL Food System can Inform Understanding and Transformation of the School Food System

There is a need to connect theoretical and practical knowledge of the unique NL food system with considerations of school food to understand and lay the foundations for the transformation of the school food system. Martin's (2011) work on food systems among the Inuit in Labrador offered insight into the impact of food system transformation not only on diet but also on Inuit identity and knowledge. Martin described how prior to the late 1970s, the people of St. Lewis viewed foods for their healthful properties: they prevented hunger and cured diseases that resulted from vitamin deficiencies. Martin suggests that by 2011, what were viewed as "poor food choices" needed to be situated historically leading to the title of her paper "We got lots to eat and they're telling us not to eat it" (Martin, 2011, p. 391). There is an important connection here to the description of the deterioration of school food systems in England and the US where too much of the wrong food was being served. Martin's research provides insight into how paradigm shifts in the global food system force food system shifts requiring epistemological shifts at a local level. Martin's interviews in St. Lewis are insightful. One woman, Iris Poole, was having to learn not about how to get enough food but about which foods to eat. This shift in knowledge from food quantity to quality was interpreted by Martin as "a transfer of responsibility for food, and how it is understood, [which] signals an almost inconceivable chasm between current and past relationships to food" (Martin, 2011, p. 392).

Sumner (2015) writes that food movements promote new ways of knowing in their quest for change. She writes, "The very dynamics that valorize expert knowledge throughout the food chain have enabled traditional knowledge to make a comeback by spawning resistance in the

form of food-related social movements" (Sumner, 2015, p. 89). New ways of understanding the NL school food system require adaptation to this socially based knowledge.

This knowledge can be found in literature about the NL food system. Available literature on food systems in NL describes a trend toward increasing dependence on industrialized, processed and imported food; the loss of food production and food system knowledge; and, an aging and dwindling population of farmers and fishers (Food First NL, 2015). Conversely, there is also research showing how Newfoundlanders and Labradorians still collect and grow many of their foods. There is also some discussion of how modern conveniences assisted in procurement and storage (Omohundro, 1994).

In the decades after Confederation with Canada, agricultural production in NL declined significantly, including small-scale family gardening. Vodden et al. (2018) describe how supplementary and subsistence farming practised throughout history has been discouraged in favour of larger more concentrated commercial farms (Vodden et al., 2018). With Confederation came increased access to waged employment and to social-welfare benefits like the federally funded Family Allowance. The growing cash economy allowed the purchase of food. Hanrahan and Ewtushik (2001) provide another example: they found that when personal or family income increased, many people stopped growing vegetables. Changes in working conditions also affected food-related traditions. For example, on the Northern Peninsula, people had to choose between participating in the traditional berry-picking season and taking summer wage work. Wage work held out the possibility of getting enough paid hours to qualify for Employment Insurance (renamed from Unemployment Insurance in 1996) which would have ensured income through the winter months (Omohundro, 1994). Gray (1977) concluded that as more foodstuffs

became available, and when women started working outside the home, there were radical changes in diets and a loss of traditional knowledge (Gray, 1977).

In a recent study of rural and coastal food systems in western Newfoundland, Lowitt (2013) discovered that nearly all of the people interviewed reported provisioning some of their own food or eating self-provisioned foods given to them by others. Motivations for provisioning food included continuing tradition, accessing fresher and better tasting food, knowing where food is coming from, and families wanting to involve their children in food activities. Tensions related to the continuation of these activities included constraints on household time and labour, environmental conditions, and changing regulatory regimes.

Lowitt (2013) cites the age of those engaged in local food production as an issue: at the time of this study the activities were performed mainly by community elders, between 55 and 64 years of age, who did not have children living in the household. Further research by Lowitt and Neis (2018) on the west coast of the island of Newfoundland, reports on the limitations in retail food access, including long distances to supermarkets, higher food prices, and a lack of fresh foods in local stores. Households were shown to have adapted to these challenges by using food provisioning strategies including bulking up on food, substituting frozen for fresh food, combining grocery trips with other appointments, and using social networks to access food. Further, Lowitt and Neis found that nonconventional food outlets such as fish plants and self-provisioned foods helped people to overcome limitations in the local environment. These findings are congruent with Vodden et al.'s (2018) study which indicated a need for community-based strategies such as community gardens that could respond to constraints in the food system.

These studies that help to describe the current NL food system do not address questions of how and to what extent the practices of food provisioning, access to food and so on, relate to

the school food system. This in addition to the summary of information about school food in this province help to justify the need for the alternative form of knowledge produced in the research chapters that make up the rest of this dissertation. The chapters that follow each focus on research on the NL school food system using a different research method. Chapter Five presents a focused study of an innovative school greenhouse, Chapter Six reports on a province-wide survey of school principals and Chapter Seven discusses results from key informant interviews with stakeholders throughout the system of school food. Chapter Eight, the final chapter, explores the connection among the multiple methods allowing for a discussion of what was found to exist compared with what could potentially exist in the NL school food system.

Chapter Five: Living Lessons of the School Food Environment: A Case Study of a School Greenhouse in Newfoundland and Labrador

Note for the reader

This case study is distinct from the rest of the dissertation. At the time that I conducted the case study I considered it to be a pilot to investigating school gardens in the province. Instead, it turned out to be a pilot study to a broader investigation of the school food system. In this case study, I refer to a *social-ecological framework*; this was eventually replaced by the concept of a *systems framework* used throughout the remainder of the dissertation. In the final chapter of the dissertation I discuss the case study using the evolved conceptual framework. The process of conducting, writing and publishing this case study was an essential part of learning and led to the development of my conceptual framework. The findings determined the relevant factors to examine in my investigation of the NL school food system (Doyle & Traverso-Yepez, 2018). Using the Comprehensive School Health (CSH) framework in the greenhouse study led to a better understanding of the process of school food system transformation. This is how the pilot case study of a school garden (Chapter Five) led to the idea to apply systems thinking as a methodology to help fill gaps in knowledge to support a school food revolution in the province of NL.

5.1 Introduction

School gardens have the potential to bring benefits to both schools and their surrounding communities. Some of these benefits include the promotion of healthy eating and active living, an enhanced sense of school community and social inclusion, the greening of school grounds and the raising of awareness about the environment, climate change and agriculture (Bell & Dyment, 2008; Blair, 2009; Block et al., 2012; Faddegon, 2005; Ozer, 2007; Rojas et al., 2011). In addition, school gardens have been found to improve overall academic achievement and to promote experiential learning (Blair, 2009; Ozer, 2007). The development of school gardening programs can also be considered a type of place-based education, where the school plays a central role in using the local community and environment to strengthen the teaching of concepts in the curriculum (Evergreen, 2000; Henry-Stone, 2008). Building a garden within the school community can teach students about their place in the natural world and their place in the ecosystem, including agricultural systems and food systems (Faddegon, 2005; Ozer, 2007; Rojas et al., 2011). Socially integrating school children into the local community can enhance a child's sense of belonging, elevate their social competence and, overall, promote positive relationships (Dyment & Bell, 2008).

Previous research that documented the different kinds of benefits and functions that school gardens can provide suggested that a social-ecological framework could help to conceptualize how change in multiple systems—including personal, interpersonal, organizational, community, and government—and also interactions between these systems, may lead to diverse outcomes (Ozer, 2007). Each specific garden program may follow a range of different pathways and depending on what path is taken, have different impacts on people.

Using a systems perspective helps to unravel the complex school environment (Butler et al., 2010; Holling, 2001). The CSH framework facilitates a social-ecological understanding of the school in the context of the local community (Bassett-Gunter et al., 2016). This involves thinking about how school policies and programs, teaching and learning, social and physical environment and community partnerships interact to support health and learning. One of the most commonly cited challenges to the implementation of the CSH is sustaining comprehensive coordination among multiple stakeholders and across differing contexts (Bassett-Gunter et al., 2016; Deschesnes et al., 2003; McIsaac et al., 2013). This case study contributes to the literature by applying the CSH framework to analyze the implementation of a school garden. The St. Francis School greenhouse in Harbour Grace also offered an opportunity to reflect on the development of the garden as a food system intervention. Understanding social worlds well requires careful study over long periods of time. The long history of the greenhouse lent itself well to such long-term assessment, in particular: what factors enabled co-ordination and what factors may have inhibited the development of this intervention (Haggis, 2010).

5.2 Case Study Methodology

The data presented below were collected throughout 2013. The case study was considered to be an ideal method to learn from this particular school about the topic. It permitted investigation into how multiple stakeholders experienced and perceived unique circumstances that led to the development of the St. Francis School greenhouse (Baxter & Jack, 2008; Flyvbjerg, 2001, 2006). In total, 14 open-ended interviews were held with teachers, administrators, community members, and government officials who were connected to the St. Francis greenhouse throughout the 20 or so years of its development. The purpose of the interviews was to explore participants' ways of thinking and insights related to the program. A

question guide framed the interviews (Appendix B). The interviews were followed by a focus group during which initial findings were presented and discussed among participants. The interviews, focus group, and continued contact maintained with the school community helped to inform the process, and are the foci of this case study of the greenhouse. This research was approved by the Health Research Ethics Authority (Reference #:13.093). Transcripts were analyzed using a constant comparison method informed by the social-ecological framework (Butler-Kisber, 2010; Ozer, 2007). The goal of this method was to develop themes based on the perspectives that participants brought to each component of the CSH framework. Initial data analysis about the case and continued exposure to growing research on the school food environment led to the adoption of the CSH model to define the full range of interactions among potential ecological health factors and outcomes.

In the following section, the findings are organized by components of CSH. First, a brief description of the development of the greenhouse is provided, then the policy environment, the teaching and learning environment, the social and physical environment, as well as community partnerships are considered. Where excerpts from transcripts are included, I have cited the interview number and page number from the transcript.

Figure 5.1

The St. Francis School greenhouse (Photograph by a teacher from the St. Francis School)

5.3 Results

5.3.1 St. Francis greenhouse: Two decades of experience with a school food intervention.

St. Francis School is in Harbour Grace, a town in Conception Bay, NL, with a population of about 3,000 (Statistics Canada, 2012). In the early 20th century Harbour Grace had the second largest population in the province, it was therefore the site of some of the province's first schools (Pitt & Pitt, 2015). St. Francis opened in 1961 as a Catholic school, becoming non-denominational in 1998. The school has since transitioned from a high school to a junior high and now accommodates students from Kindergarten to Grade 8.

The inspiration to build a greenhouse is said to have originated with a previous school custodian, Gustav Reinhart, to whom the greenhouse was officially dedicated. Beginning work at the school in 1974, Reinhart was an inspiration to the staff and students, meticulously caring for the school grounds by growing flowers and shrubs. He also kept a wooden greenhouse in the back of the schoolyard (Bowman, 1994). The St. Francis greenhouse, built in 1992, is a 2,400 square foot polycarbonate structure (Figure 5.1). At the time, it was a model for technological

innovation, featuring automated watering, ventilation, and lights. The vice principal at the time, identified as RB, was a strong driving force behind the greenhouse. He felt automation was necessary in order to manage the greenhouse in the busy school environment. In addition, students would be exposed to the latest technology in the horticulture industry and would learn as much about computers as they would about plants and entrepreneurship. The original financial plan for the greenhouse was that students would be able to generate enough money from the sale of tree seedlings grown in the greenhouse to sustain the cost of its operation. This original plan did not take root.

Since the beginning, the greenhouse has been used for different purposes and has relied on different sources of funding and support, including: the Eastern School District (now the NLESD); the Lower Trinity Regional Economic Development Board (now defunct); the DHCS; the previously named provincial Department of Natural Resources, which used the greenhouse to feed the 2012 NL Summer Games athletes; Environment Canada; and the previously named provincial Department of Environment and Conservation. Today, the greenhouse shows signs of deterioration and it is in need of a new influx of funding to reinvigorate both the infrastructure and programming. However, at the time of writing this chapter, there were promising signs of a partnership involving the school, a nearby farm, and a local catering company that would supply the school cafeteria with produce that students would grow in the greenhouse (Robinson, 2015).[2] While the greenhouse was not initially called a school food intervention, it is described this way because for much of its history the greenhouse has been a site of food production, and because this was the direction of this facility at the time of the study (Figure 5.2).

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[2] To the best of my knowledge this has as of yet not materialized and most recently the greenhouse was being used to store the school's recyclables.

Figure 5. 2

The greenhouse in the 1990s (Photograph by teacher from St. Francis School)

5.3.2 Policy, leadership, and management of the St. Francis school greenhouse.

This section explores how leadership and management practices have interfaced with shifting policy directions throughout the history of the St. Francis School greenhouse. Broadly speaking, some significant policy-related issues influenced the creation and development of the greenhouse. In the 1990s, the cod moratorium had a province-wide impact on the Newfoundland and Labrador education system. At this time, funding became available for projects that would help to expand the economy outside the fishery. In the early 1990s, there was a strong push from both the federal and provincial governments to find alternative employment opportunities and education for young people (Sheppard, 2003). RB, the vice principal, was looking for something that would make "teaching as real as possible." RB promoted the idea of a school greenhouse as a way to give students the experience of operating a business. The business plan was to grow tree seedlings to sell throughout the province. He contacted greenhouse manufacturers across North America to learn about potential designs and approached Human Resources Development

Canada (HRDC) and the Atlantic Canada Opportunities Agency (ACOA) with his proposal, which was subsequently approved. The concept was innovative for its time, offering students at risk of becoming early school leavers a reason to stay; the cross-curricular, hands-on practical instruction was intended to increase their interest in school.

The transition from denominational to non-denominational schools in 1998 reflected another important political change. One of the participants remarked that this transition resulted in an increasing amount of bureaucracy and a decreasing amount of control at the school level. This is noteworthy given that one of the primary policy objectives of this educational reform was to increase local involvement in decision-making by transferring full control of the provincial education system from the churches to the provincial government (Kelly, 1997). As part of the shift from a denominational to a non-denominational system, St. Francis was converted from a high school to a junior high. One of the consequences of this decision was that senior level courses designed for implementation in the greenhouse—horticulture and entrepreneurship—did not neatly fit into the junior high curriculum. Those interviewed also noted that the school experienced a high turnover rate of staff after this transition. This meant that whole-staff projects, previously maintained from year to year, were harder to sustain as there were fluctuations in the staff each year.

Another significant policy that influenced the greenhouse intervention was the HSHS initiative (Government of Newfoundland and Labrador Department of Health and Community Services, 2006). The greenhouse found its second iteration as a complement to the Department of Education's Healthy Living curriculum for school children in Newfoundland and Labrador (Government of Canada Public Health Agency, 2009). The enactment of this new vision of the greenhouse came from the Lower Trinity South Regional Development Association (LTSRDA),

which continued to use the greenhouse to engage children in entrepreneurial activities. This time, however, children were growing food themselves, thereby empowering them to learn about healthy food and how to grow and process it (Government of Canada Public Health Agency, 2009; Sullivan, 2011). Throughout the early 2000s, much of the programming was executed by the regional economic development organization. In 2013, Newfoundland and Labrador's regional economic development organizations lost both national and provincial funding, which undercut the services that had been available to children.

Leadership for the greenhouse has come from the school administration, and the school council has also played a critical role in sustaining and supporting the greenhouse throughout its existence. When the school district considered dismantling the greenhouse, the school council rallied to its support. Research participants described the early years of greenhouse development as "more flush" with resources and they stated that, in recent times, there were more cuts at the school and community levels. This has made it challenging to maintain the high level of support and human resources needed to fulfill the initial vision.

Shifts in policy and leadership and management at the school level have influenced both the development and the attrition of the greenhouse. The bottom line was that, despite these shifts, the greenhouse still stands, more than 20 years after being built, and it is still an inspiration for the school and the surrounding community. Almost everyone interviewed mentioned the substantial amount of time, patience, and energy people had to invest to ensure greenhouse projects were running smoothly. This constant upkeep often required visiting the greenhouse after hours and on weekends. Greenhouse programming also required knowledge about plant production, curriculum development, and extra supervision of students—even project development and management skills. But "resources weren't there for that" (13, T6, p. 3). In the

past, the school had a committee responsible for keeping the projects moving, and there is

currently interest in setting up a committee to oversee the greenhouse program. The reality is that

even establishing a committee takes extra time and resources. Participants commented on the fact

that opportunities depend on resources and leadership: "The opportunities are endless, if

somebody had the resource to take it and run with it. A lack of resources has led to

underutilization" (4, C2, p. 5).

5.3.3 Teaching, learning, and the St. Francis school greenhouse.

In the early years, learning about the growth of tree seedlings, the operation of the

greenhouse and the development of the business side, offered students a hands-on and cross-

curricular learning opportunity. Active engagement was often a natural component of teaching

and learning in the greenhouse and had a positive influence on the greater teaching and learning

environment in St. Francis School.

In those early days of the greenhouse enterprise, staff members were encouraged to

design a curriculum that would allow them to use the greenhouse. This initial push from

administration led to the development of a horticulture course and also helped the school become

a leader in the area of technology education. The greenhouse was equipped with video cameras

that allowed students from neighbouring communities to learn about greenhouse operations from

a distance. The video cameras led to teaching video production and marketing and the early

adoption of smart boards (interactive touch-sense white boards) in the school. The impact of

these changes on the learning environment was positive. Several years after the greenhouse's

debut, a newspaper article reported the success of students involved with the greenhouse: "Even

though one third of the students . . . are considered to be at risk of dropping out, none of the

enterprise students have dropped out since the course began two years ago and it has recorded a 100 percent pass rate" (Bowman, ND).

When the school transitioned into a junior high and the Lower Trinity Economic Development Board began to use the greenhouse to grow food rather than tree seedlings, the benefits of hands-on and cross-curricular learning persisted (Figure 5.3). The teachers who were interviewed believed that hands-on learning led to enhanced memory formation and also to an enhanced sense of ownership and a positive sense of involvement for students. "It was amazing to see how much pride those students showed in terms of what they were able to accomplish in the greenhouse" (11, T4, p. 2). Giving students the chance to engage in a project with a tangible purpose proved to be highly meaningful and beneficial—especially, as teachers testified, for those who may not have excelled at traditional pencil-and-paper activities. By providing an alternative learning environment, the school was able to accommodate different learning styles, thus promoting inclusive education. Learning in the greenhouse classroom also enabled a caring environment as students learned to work better together:

> The ones who came in fast and furious had to slow down because there are hoses and things to trip over. You have to get the plant in the centre of the pot and you can't rip out the root. So that type had to slow down. And the one that was shy, meek, and mild did end up saying "My turn in there, my turn!" (6, G3, p. 12)

Figure 5.3

Inside the St. Francis greenhouse (Photograph by a teacher from the St. Francis School)

Teachers were also motivated to learn, as expressed by one respondent: "Part of it was for me to learn a little bit more, like, can we grow corn? How do we grow corn? I think the whole thing has been a really good learning process, not only for the kids, but for me and the student assistants" (3, T2, p. 4). Teachers often took pride in the greenhouse and shared positive memories from their experience: "I do remember the looks on their faces and how exciting it was to be outdoors and to be gardening in October" (2, T1, p. 5).

Some examples of project-based learning or hands-on learning organized around the investigation and resolution of real-world problems (Smith & Gruenewald, 2008) took place in the greenhouse. In one instance children transplanted lettuce started in the greenhouse to a local farm. When the lettuce was mature, they harvested, bagged, labelled, and sold it at the local grocery store. In another case, students grew tomatoes, then processed the tomatoes into salsa and sold it. These projects offered links to subjects taught in the curriculum, such as the

chemistry and biology of growing and preserving plants, the mathematics of selling produce, and the language of marketing.

As the literature shows, there is a link between active engagement and students' health and well-being. That is, the more freedom students are given to participate in decision-making and the learning process, the more likely they are to develop intrinsic motivation that can positively enhance academic achievement and overall well-being (Rowling & Jeffreys, 2006). Yet the planning, execution, and evaluation of active engagement in schools can be challenging. The development of project-based learning requires extra teaching resources, which have been achievable during times of funding. However, a number of participants in this study pointed out that classroom teachers do not generally have enough time on top of their current workload to easily design these potentially cross-curricular, project-based experiences within the established curriculum and current evaluation schemes.

5.3.4 The interrelated social and physical environments of the St. Francis school greenhouse.

At times, there was a noticeable effect of the greenhouse on the social environment of the school and the surrounding community. The greenhouse was often cited as a source of pride for those interviewed, and it seemed to have the effect of drawing people together. Examples of this effect occur at a number of levels: first, as noted above, students learned to co-operate in new ways; second, the formation of a greenhouse committee and a greenhouse after-school club increased involvement and interaction between teachers and the community; third, the greenhouse led to projects that connected St. Francis with other schools throughout the province; and finally, the greenhouse depended on the involvement of a long list of partners, which will be discussed in further detail below.

Although the physical environment is considered an important aspect of developing a healthy school, it is often given less attention than factors such as leadership and governance in school health literature (McIsaac et al., 2015c). One of the study participants believed that the physical attributes of the greenhouse contributed to its success and longevity:

Twenty-five years ago, whoever had the foresight to say I'm spending a lot of money and I'm getting the best facility I can [got it right]. I'm not going with wood and plastic, I'm going with glass and steel. And that greenhouse has stood pretty solid for up to 20 to 25 years—when I walked in my first impression was: Wow! This is an expensive facility, and that they had the foresight to say, we're going with the top-notch, we're not going half in, we're not going slap-happy. We're investing in a solid structure. And to me, that was one of the best decisions that they made (6, C4, p. 1).

This participant's comment supports the notion that the built environment was important in creating healthy school communities. With the physical existence of the greenhouse came new learning possibilities for teachers, students, and the surrounding community. Students were also motivated by the aesthetics of the greenhouse, as commented by another teacher: "They really liked playing in the dirt. I think they thought, sensory-wise, it was probably very sensory fulfilling. Plus, there's something about the light out here and the heat and the building structure itself—they really seem to enjoy that part of it" (3, T2, p. 3).

Teachers noted that the greenhouse had a therapeutic effect on them. It was also used as leverage for grant proposals: "I was applying for different grants, and people saying all right, what he's doing out there, he's pretty innovative, so we'll give him that grant" (12, T5, p. 11). In addition, there was an important interaction between the physical environment and the social environment in determining the health of students. One participant remarked:

Anything that helps with the coming together of people is going to help improve the collective health of the group because we know that sense of connection and diminishing of the isolation, sharing of skills and ideas, the sense of camaraderie, [it] helps if people have that connection, the chances are that they're going to feel better about themselves (10, G2, p. 3).

However, the difficulty of measuring these health benefits was also noted by a respondent:

Can you say, "Okay, we build a garden and chronic disease goes down?" Probably not, but if you want to be able to make that environment, then do you want to make that investment too, because eventually things become mainstream? They become the common (7, G1, p. 9).

This comment highlights the insufficiency of using positivist methods to understand complex outcomes. It also provided insight into how the built environment helped to define the baseline that became a common or acceptable way of living. This, in turn, led to questions about current approaches to school health investment. Currently, most such investment comes in the form of small project grants. However, this type of short-term investment would not yield the significant change to the built environment that occurred at St. Francis School.

5.3.5 Community partnerships and the St. Francis school greenhouse.

At different points throughout its history, the school greenhouse partnered with the Department of Health, the Department of Natural Resources, the Department of the Environment and Conservation, the Regional Economic Development Board, the Town of Harbour Grace, local businesses, parents, and the school council. This diversity of partners indicated the school's vigorous engagement with the community. The extensive school-community engagement provides an exemplary model of the type of school-community interaction that is critical in

ecological approaches to health. The school's various partnerships developed out of necessity. As voiced by one participant, "I know with our current budgets in terms of the school board, we wouldn't be able to sustain or keep the greenhouse going, so without the community support, it probably wouldn't be able to continue or exist any longer" (11, T4, p. 4). The potential of the greenhouse to have a favourable influence on the community was also mentioned:

> You get a return on it, for goodness sake. You get a big return. And we're not just talking a return financially. Once it [growing food] gets in the school system, then the kids will become involved [and] then they'll go home and tell their mom and dads, "This is what I'd like to do," right? I mean, and that's the way we get the best support, from the kids telling their grandparents (5, C3, p. 6).

The influence of the greenhouse was also apparent following a project in which five students were working together in the greenhouse: "And I have to say, two kids out of the five had actually convinced their parents to either break ground or put up a greenhouse" (6, G3, p. 19).

Engagement and support from the community were central to the operation of the greenhouse. However, a fine balance existed between building community capacity and unloading burdens and responsibility onto the community (Allen & Guthman, 2006). Today, community engagement is further complicated by liability issues. For example, in response to the question of whether organizing the greenhouse as a community garden would help to sustain it, one participant described their perception of a liability issue: "You can't do an open community access garden because it is attached to a school and that's just for liability" (1, C1, p. 17). The theme of tension in school–community partnerships will continue in the next section.

5.4 Discussion: The Greenhouse as a Responsive yet Unintended School Food Environment Transformation

This case study is unique for two reasons: first, the St. Francis School greenhouse, built in the early 1990s, was a novelty for the province, and perhaps even for Canada; and second, its more than 20-year history has granted a broader perspective to examine how the multiple components of an ecological health framework combine and interact. The CSH framework helped to structure this case study, bringing to light how a number of factors combined to either facilitate or inhibit a social-ecological approach to school health.

When respondents were asked how the greenhouse impacted student health, the most common answer was that it increased exposure to healthy food (the physical environment). Emphasis on the direct link between student health and healthy food is important yet limited. Understood more holistically, health extends beyond physical wellness to include emotional, spiritual, and mental well-being. In this perspective, the positive influences on child health from the teaching and learning environment and from the physical environment became clearer through the ecological framework. Community involvement also had a positive yet indirect influence on student health. One participant describes this nicely:

> Benefits are expanding way beyond what kids have to learn. If you're going to bring in parents' involvement or other community partner involvement, then you've got a municipal thing happening. And you've got a skill set and a knowledge base being built in the community. Then you've got your health promotion piece that goes with it. (7, G1, p. 9)

The aesthetics of the greenhouse also had a positive impact on the health of students. According to the teachers it fulfilled sensory needs. Other positive effects were inclusiveness, noted previously, and teacher engagement.

Despite the array of potential benefits, significant barriers to the full utilization of the greenhouse existed. At no point was there a policy that explicitly advocated the use of the greenhouse to support broad-scale healthier school practices. The lack of sustained support meant that the school community had to continually reinvent the greenhouse in order to continue to sustain benefits. An amazing degree of multi-stakeholder coordination evolved despite the lack of any overarching institutional support. Sustaining this coordination involved constant struggle. This made it challenging to maintain positive impacts on student health and learning. Shifting to an ecological view accommodates the perspective that health and learning are indivisibly connected. However, this view of health and learning must contend with the current purpose and design of the educational system, where subject-based testing is integral to determining outcomes, and from commonly accepted understandings of health. As one interviewee put it: "it's the hospitals and the dialysis machines and all that stuff" (10, G2, p. 7).

5.4.1 Using food to foster connections between school and community.

If the greenhouse had been planned as a school food environment intervention from the outset, this might have led to more harmony among policy stakeholders, the teaching and learning environment, the physical environment, and the social environment. Investigating the role of urban school gardening in the 21st century, Gaylie has said that perhaps the most important benefit of school gardens is how they lead us to question the assumptions made about the "place" that schools have in society (Gaylie, 2011). This is increasingly important as students are spending more time today in school and are perhaps less healthy than ever before (Ogilvie &

Eggleton, 2016). For these reasons, the lessons from this case study add to the recognition of how interventions in school food environments can help to challenge how children are educated today, as the "school garden is potentially the start of a groundswell of movement for teachers ready to engage students in experiential, transformative environmental learning" (Gaylie, 2011, p. 7). In Newfoundland and Labrador, as elsewhere, there has been drastic change over the past 50 years in how food is produced, who produces it, and where it is produced (National Research Council, 2015). An important finding of this case study is an acknowledgement among participants that important lessons, which were developed from an intimate connection with the land and sea and which were incorporated into the cultural fabric of society, are now not often being taught.

The initial investment in the school's physical infrastructure resulted from a need to diversify the economy when the fishery collapsed. This political and economic investment might not have been thought of as relating to food policy at the time, but in the case of the St. Francis greenhouse it allowed those connections to be made.

Concerns about the present-day food system and an interest in preserving the tradition of sustainable food practices in Newfoundland and Labrador were guiding principles that motivated many key actors in the community. Teachers who were active in the St. Francis greenhouse program were motivated by the opportunity to reconnect children with the food system, to reconnect them with hands-on experiential learning and more generally to teach practical skills. This began with RB, who described his early childhood as a source of inspiration for his involvement with the greenhouse project:

> Yeah, it came from my father. I mean, we always had our own vegetables. So, every
> summer we had to do the weeding and all that stuff. And in the fall, we'd have to do the

harvesting and we used to have to put it all away in the cellar. And every now and then father would say to me, RB, go up to the cellar now and bring down some vegetables and a side of pork. He'd have a pig up there hung up, and I'd go up and cut off a piece of that and go down the cellar and get the cabbage and the turnip and the potatoes. Then out behind our house was a small little plot of land about 10 feet by 20 feet, so I'd start picking away at that, putting potato seed in and all of a sudden I saw it growing and turning it out. So, I got interested that way. (8, T3, p. 12)

RB's vision for the development and use of the school's land resonated with community members, inspiring them to revisit and identify with traditional food practices. Some participants mentioned that their concern about the degree of pesticides and preservatives present in produce was a reason to grow food:

You're producing vegetables, so you've got healthier food to eat, which is a big thing with pesticides and you hear about different issues with foods and what's added to foods to preserve them and whatnot . . . we've gotten away from growing our own vegetables as a family over the last fifty or sixty years. So, I think that's something we should all get back to. (13, T6, p. 2)

Participants asserted that students became conscious of the fact that agriculture is possible in Newfoundland and Labrador: "A lot of them didn't have the faith that it could be done in Newfoundland" (6, G3, p. 14). This exposure is critical for developing agricultural capacity at the provincial level (Quinlan, 2012). Also, the greenhouse exposed students to farming and increased their understanding of the province's food system, a subject not typically learned in school. In doing so, they also learned that farming is a viable occupation:

Once they're in Level I, they've got their first set of courses picked, their teachers and their counsellors are talking about, well this is the way you're going—you're going to go engineering, you're going to be a teacher, nurse, doctor, lawyer. Nobody mentions farmer, you know, unless your dad and grandfather and your Uncle Tom, whoever, was a farmer. You really didn't have that exposure. (12, T5, p. 5)

The initial intent to diversify the economy was one factor that led to the building of the greenhouse. From that grew a number of unforeseen connections to the Newfoundland and Labrador food system: (a) students were exposed to new foods; (b) teachers felt enhanced motivation to engage students with the greenhouse because they were concerned with the lack of food knowledge and the deleterious aspects of industrial food production; and (c) students learned that local food production was possible. This case study shows how the St. Francis greenhouse, while not labelled an intervention in school food, was well positioned to help participants respond to some of the complex challenges present in the Newfoundland and Labrador food system. These include an increasing dependence on industrialized, processed, and imported food, loss of food production and food system knowledge, an aging farmer population, and low fruit and vegetable consumption (Food First NL, 2015). Food was a means to tie together the fragmented worlds of school, community, agriculture, health, culture, and politics (Wallinga et al., 2009).

That broad-scale interventions in students' health and well-being are few and far between and that the province's food system is in need of improvement are the two main incentives for further investigating what factors may enhance or diminish the ability to nurture comprehensive health outcomes at school (Food First NL, 2015; Olstad et al., 2014; Stuckler & Nestle, 2012).

5.5 Final Considerations

The essence of an ecological approach to public health lies in gaining an acceptance and understanding of the complex connections among people, places, communities, and the environment. These connections determine the quality of our lives and how people live together in sharing our resources and infrastructure, such as air, water, soil, and food (Rayner & Lang, 2012). However, making and understanding these connections is challenging. My goal in presenting this case study was not to minimize or eliminate the complexity of the school food environment, but to link aspects of it that may have previously seemed disconnected. This was accomplished by outlining how the various components of the comprehensive model of school health (CSH) interacted throughout the development of the St. Francis greenhouse. Weaving the stories and experiences of the people who have been connected to the greenhouse over the past 20 years revealed that the passing of time is a significant factor when researching ecological public health. It allows a deepening of perspective necessary for an observation of people and the systems they live in (Haggis, 2010).

I will conclude this chapter with a story told by one of the study participants. The individual described the importance of filling the entire greenhouse with plants in order for the greenhouse to flourish:

> If you leave the greenhouse half empty, you don't fill it up right, you never get the humidity built up because you don't have enough plants in there to be doing what they're supposed to be doing. So, there's a fine line between a sparse greenhouse [being] really easy to take care of because it's less time to water, plants are nice and far apart, you can pick leaves easy [sic] compared to, I'm going to space them together and just have that many in there respiring in the nighttime. (6, G3, p. 14)

Discovering the ideal conditions for plant growth can be likened to creating the ideal conditions for a thriving school food environment in Newfoundland and Labrador. Taking small steps in its development, that is, through small grants and publicity campaigns, may be a safe starting point, but the conditions that developed at the St. Francis School in Harbour Grace give reason to believe that a bolder, long-term vision is necessary to address the complexity of the challenges faced by children and society today. The most important question has yet to be answered: How can the Newfoundland and Labrador school food environment be enhanced to optimize the education and health of children?

Chapter Six: "No matter how hard we try, students are still exposed to poor choices":

Findings from a 2016 Survey of Principals about the Newfoundland and Labrador School

Food System

6.1 Introduction

This chapter reports on findings from a survey of 68 principals in the province of Newfoundland and Labrador (NL) about the school food system. The objective of the survey was to gain an updated and more systematic understanding of the province's school food system viewed through the eyes of school principals. Principals are critical stakeholders in school health (Kendrick, 2018; Storey et al., 2016). Drawing on the principal as a critical source of information about school food is a way to connect this survey to previous surveys conducted in this province in 2001 and 2007 which also surveyed school principals. The survey questions helped to answer three research questions which guided a multi-method investigation of the NL school food system. These questions were:

1. What programs and policies exist in the NL school food system? Survey questions asked more specifically about perceived barriers to healthy food at school, observed common foods sold at school, lunch time and lunch destination, food-system supports and how they were accessed, and perceptions of food accessibility.

2. What were principals' knowledge, attitudes and needs concerning school food? To answer this question the survey asked principals about perceived health concerns and also about their beliefs regarding the relationships among food, health and learning. It also included questions about perceived connections between food and curriculum.

3. To what degree do programs connect with the NL food system? Under this question, the survey asked what food system programs are available and how programs integrate with the community.

As school food can be understood as a system of factors that connect to education, health and sustainability, working towards achieving multiple interrelated outcomes requires research that can bring to light the way in which components of the school food system interact (McIsaac et al., 2019). This survey tried to fill gaps in knowledge by asking questions which made a bridge between past surveys of the NL school food system and emerging conceptualization about school food. It additionally responds to an ongoing paradigm shift taking place in thinking about school food both internationally and nationally (Oostindjer et al., 2017). Given long-standing barriers to healthy food in NL schools, it is hoped that these survey findings will support awareness of the current structure and function of the school food system in NL leading to more healthy and sustainable outcomes.

6.2 Survey Design and Methodology

The model of systems thinking which informed the survey's design included three principles: ongoing iterative learning; collaboration across disciplines; innovation (Swanson et al., 2012). The manner in which each of these principles informed the research design is explained below:

Ongoing Iterative Learning: To enhance relevance and applicability I sought input and feedback from stakeholders within the province's school food system to help guide the development of the survey questions. These stakeholders included health and educational professionals as well as community organizations active in school food. Questions from two previous surveys about school food in NL also influenced the questions that were included in this

survey. It was thought that this could enable insight into how the system of school food had changed through time.

Collaboration across disciplines: While previous investigations into school food in the province focused mainly on eating and food delivery at school (Coalition for School Nutrition, 2001; Government of Newfoundland and Labrador, 2007), this survey attempted to gain new information about the ways in which schools might have been engaged in other aspects of the food system including growing and harvesting food, and fishing. The concept of the *school food system* that informed the survey questions was inspired by the definition of the school food system used by the SFEAT. The SFEAT used the CSH framework to frame the school food system in order to discover the extent to which schools have integrated healthy and environmentally sustainable food initiatives (Black et al., 2015). An important component of this new approach was the use of an expanded map of school food system stakeholders that included organizations such as Little Green Thumbs (LGT) (the province's Agriculture in the Classroom program). A map that highlights the system stakeholders can be found in Appendix C.

Innovation: Research about school food tends to look at fragmented components of the school food system by addressing, for example, only foods eaten or the existence of policies. Applying systems thinking to the research process demands the incorporation of new methods and actors to understand interactions (Black et al., 2015; Dolan et al., 2005; McIsaac et al., 2019; Rojas et al., 2011). Developing a survey that could connect both to previous province-specific surveys and also to emerging research about the systems nature of school food is an innovation in method. Previous research about the NL school food system has mainly been quantitative with verbatim answers left out of reports or left in an unanalysed form. This survey included a number of open-ended questions as this type of information was thought to be critical to help form an

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understanding of the complexity of settings and the values of those in the setting. The survey results were also be analyzed in relation to other components of this multi-method investigation in Chapter Eight.

6.2.1 Survey distribution and analysis.

A request to endorse the survey was sent to the minister of education and early childhood development in order to achieve a high response rate but no response was received. The research was approved by the Newfoundland and Labrador Health Research Ethics Authority in April 2016. The survey was made available through Google Forms from June 2016 to November 2016. The survey was available only in English. It was sent and approved by the NLESD and the *Conseil scolaire francophone provincial de Terre-Neuve-et-Labrador* (CSFP) (the province's Francophone school board). The survey was sent to the Innu Education Board for approval but no response was received. The survey was also sent directly to an Indigenous school as designated by the DEECD (Government of Newfoundland and Labrador Department of Education and Early Childhood Development, 2019). To increase anonymity of informants, returned survey forms did not include school names, so individual schools cannot be identified.

The invitation to participate in the survey was the first section of the Google Form. This invitation provided information on the study and informed participants that all data collected would be anonymous and kept confidential. Completion of the survey was understood to mean the respondent had read the invitation letter and had consented to take part in the study. Appendix D includes a copy of the survey invitation and the survey.

Data from the surveys were automatically entered into Google Forms and then downloaded to Microsoft Excel. Of the 20 questions, 11 were open-ended. For both the multiple-choice and open-ended questions, analysis began with the creation of frequency tables made by

tallying the numbers of each response. The frequency table listed the most frequent responses down to the least frequent responses and are included in Appendix E. The frequency table shows the number of respondents who selected each response and the number of responses made by each participant. Open-ended responses to these questions were thematically analyzed using a five- step process (Braun & Clarke, 2006). First, all responses were read to enable familiarization with the data. Second, repeated words and categories were identified. Third, categories were created to reflect the range of similar-themed answers. For example, items such as "eating too much processed food," "proper nutrition," "sugar consumption," and "packaged food" were all grouped under the category "diet." Fourth, all responses were grouped according to these inductive categories. Finally, tables were created to show the distribution of responses according to each category. This analysis enabled the identification of themes among the responses. This was the process used to induce the most salient sentiments shared by these 68 professionals who voluntarily shared their opinions.

6.3 Survey Results

This section presents survey results beginning with a description of who participated in the survey. Survey forms were received back from 89 respondents. Of these 89 survey respondents, 68 were principals, three were vice-principals, 17 were teachers and one was a guidance counsellor. This chapter will report only responses from principals to ensure that each individual research participant represented a unique school. I discuss the removal of the 21 non-principal responses further in the survey limitations section of the discussion.

Twenty-five percent of the total number of schools in the province participated in the survey (68 out of a possible 270) (See Appendix F for further information on survey demographics). Of these, 41 % (n=28) were all grade schools (K-12), 31% (n=21) were

primary/elementary schools and 28% (n=19) were junior high or senior high schools. Figure 6.1 shows grade distribution of schools surveyed compared to grade distribution of schools in the province.
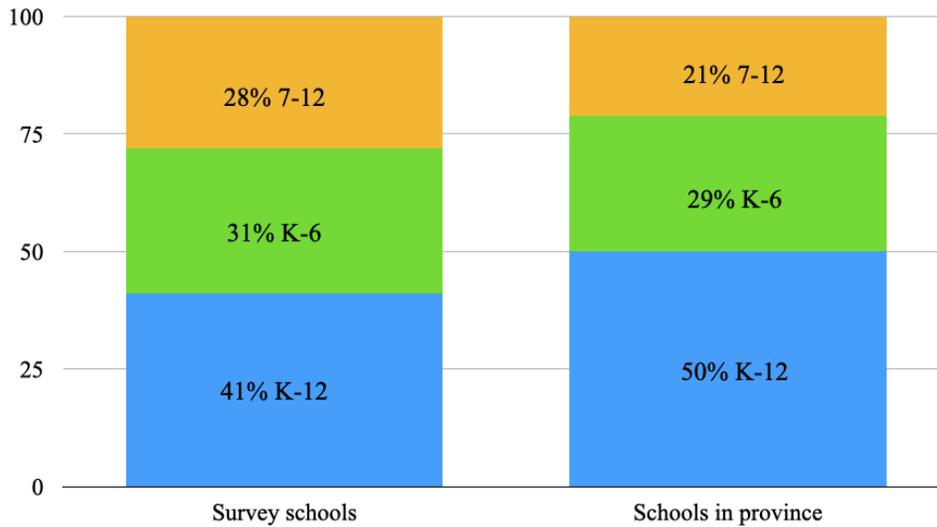
Figure 6.1

Grade distribution of schools surveyed and schools in province

Schools that took part in this survey were located province-wide. Twenty-seven were from the Eastern Region, nine from the Central Region, 21 from Western Region and 11 from Labrador. Figure 6.2 shows the geographical distribution of schools surveyed compared to the geographical distribution of schools in the province. Labrador schools are over-represented in the responses and schools in the Central Region are under-represented.
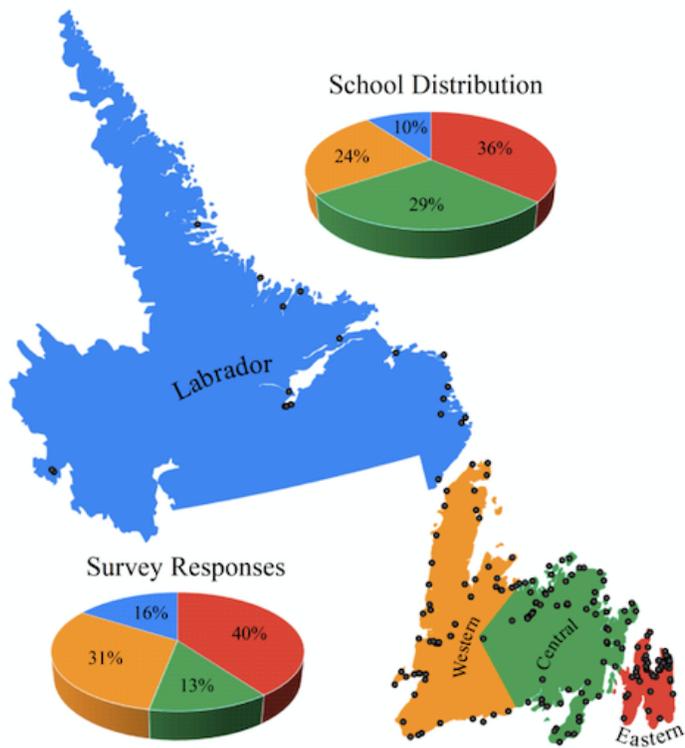
Figure 6. 2

Geographical distribution of schools surveyed and schools in NL (Map credit: Myron King, with map data sourced at https://www.nlesd.ca/)

Survey results are presented according to the research questions. Table 6.1 below shows how

survey questions line up with the broader research questions.

Table 6. 1

Survey questions addressing question of what programs and policies are in place (MC= Multiple choice (responses limited to one selection); MS: Multiple selection; OQ: Open question)

Broad Research Question	Survey Questions
What programs and policies exist in the NL school food system?	Q8. What do you think are the 5 top selling food or beverages at your school (including cafeteria, canteen or vending machine purchases)? (OQ)
	Q11. What foods are currently banned from school premises due to food allergies? (OQ)
	Q5. What barriers (if any) has your school experienced in supporting healthy food consumption at school? (MC)
	Q9. On an average day how much time do students have to eat lunch? (OQ)
	Q10. Describe some of the most popular lunch destinations outside of your school which students frequent? (OQ)
	Q18. How accessible is healthy food (fresh fruits and vegetables/ minimally processed food) at your school? (MC)
	Q19. How accessible is healthy food (fresh fruits and vegetables/ minimally processed food) in the community surrounding your school? (MC)
	Q12. Which of the following supports has your school accessed to enhance the school food environment? (MS)
What were principals' knowledge, attitudes and needs concerning school food?	Q4. What do you consider to be the biggest health concerns facing your students? (OQ)
	Q6. Do you believe student learning is impacted by the quality of food students consume at school? (OQ)
	Q7. Do you believe student health is impacted by the quality of food students consume at school? (OQ)
	Q13. Do you know of any food links being taught in the curriculum at your school? If so, please describe. (OQ)
To what degree do programs connect with the NL food system?	Q14. Please select the following food- related cultivating programs and/or initiatives offered to students at your school? (MS)
	Q15. To your knowledge have any of your school's food services or programs made connections with local producers, fisher people, community members or parents? (OQ)
	Q16. Does your school have a committee that oversees policies and practices concerning healthy eating at your school? (MC)
	Q17. If so, what main actions has this committee focused on in the past 2 years? Have you noticed a change in learning or health outcomes based on the actions of this committee? (OQ)
	Q 20. If you have any observations, questions or comments about school food that haven't been addressed above, can you describe them below? (OQ)

6.3.1 Institutionalized supports: Programs and policies in place in NL schools.

The broad question of what policies and programs existed within the NL school food

system relates to a number of survey questions. To ascertain what types of foods were being

consumed at schools across the province, respondents (n=67) were asked to list the top five

selling food or beverages at their schools, including from the cafeteria, canteen or vending machines. The top 10 foods mentioned are listed in Figure 6.3.
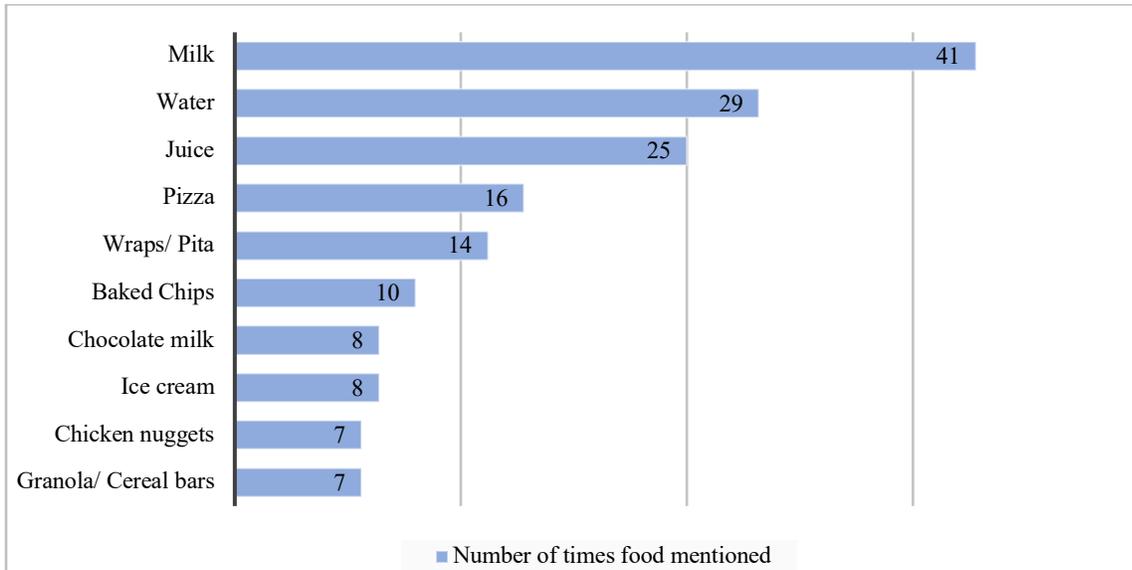
Figure 6. 3

Top selling foods or beverages sold at school

The common mention of milk reflects the presence of the School Milk Program that operates in 90% of the province's schools (School Milk Foundation of Newfoundland and Labrador, 2021). The common practice of purchasing water across the province is notable considering the environmental impact of bottled water and raises the question of why students are not consuming tap water. Findings about the foods sold are consistent with the earlier 2001 and 2007 investigations about the types of food served at school: milk, pizza, ice cream and chicken nuggets are among the most frequently cited foods.

The most commonly mentioned banned foods are detailed in Figure 6.4. Nuts were the most common food to be banned in 2016. "Nuts" is a broad category that I created in the thematic analysis of this open-ended question (n=65). The category included the responses of "peanuts" (in fact, not actually a nut, but a highly allergenic legume nevertheless), "tree nuts," the generalized mention of "nuts," as well as specific mention of other types of nuts. The second

most commonly mentioned banned food was fish. This was another broad category that included mentions of "fish," "shellfish," and "seafood." Only twelve percent (8/65) of respondents said they had no food banned at their school. Twenty principals listed two banned foods, 18 listed one banned food, and one principal listed 14 banned foods. The list of banned foods at one school included coconut, cherries, garlic, apples, all nuts, all fish, eggs, peas, flowers, kiwi, starfruit, white cranberry juice, all melons. This respondent also listed latex and Axe (a scented non-food item.)
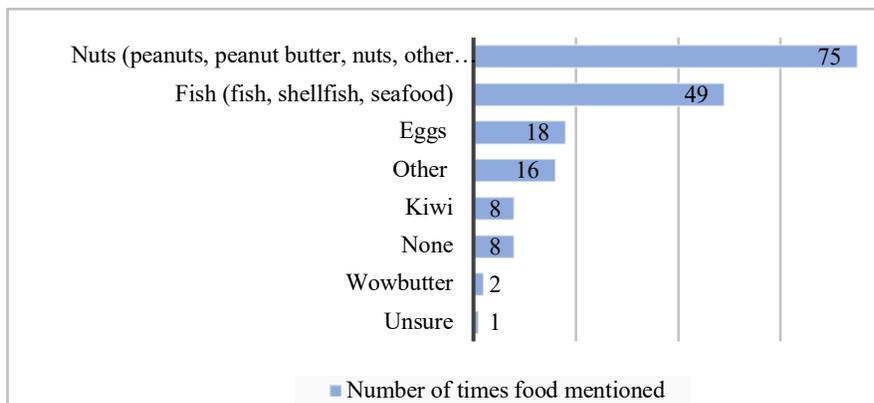
Figure 6.4

Foods currently banned due to allergies

A survey question about barriers to healthy food consumption at school was adapted from a survey of principals in Alberta about the school food environment (Alberta Policy Coalition for Chronic Disease Prevention, 2015). Common barriers selected were "limited student demand" and "cost of healthy food" (n=68). Most people responded with only one barrier (n=66). This was likely due to the nature of the question being limited to one choice. However, some respondents used the space for "other" to enter multiple barriers. Other mentioned barriers are listed in Figure 6.5.

Limited student demand for healthy food	22
Cost of healthy food	22
Availability or accessibility of healthy food	17
Other*	4
No barriers were experienced	2
Existing contracts limit consumption of healthy food	1
It is not a priority for our school at this time	1
Not sure	1

■ Number of times item mentioned
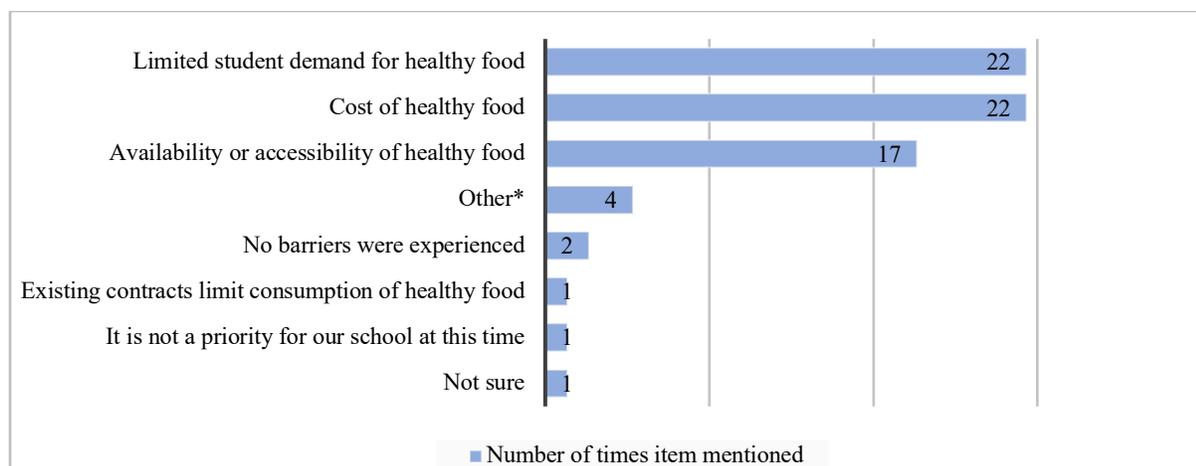
*Other responses (n=4)

Local franchises with other options;
Parents, we need a culture change;
The storage of fruits and vegetables on an ongoing basis would be a challenge for us;
Availability, cost, lack of demand. Students will choose to eat if items are free. We do not stock fresh items in canteen because of cost and, ultimately, they spoil.

Figure 6.5

Barriers experienced to supporting healthy food at school

Barriers cited by principals differ among the different regions. In the Western Region, principals were more likely to indicate "student demand" while principals from Labrador were more likely to choose "availability and accessibility." Schools from the Central Region were more likely to select "cost." The interconnections among demand, cost and accessibility are an issue not addressed by the question about barriers experienced to supporting healthy food at school.

The amount of time students were given for lunch varied. In 2016, the most common response for "time to eat" was 20 minutes with 27% (18/66) of respondents selecting this answer

(n= 66). The time given to eat school lunches varied between 20 to 60 minutes. Figure 6.6

contains more information about the variations in lunch times.
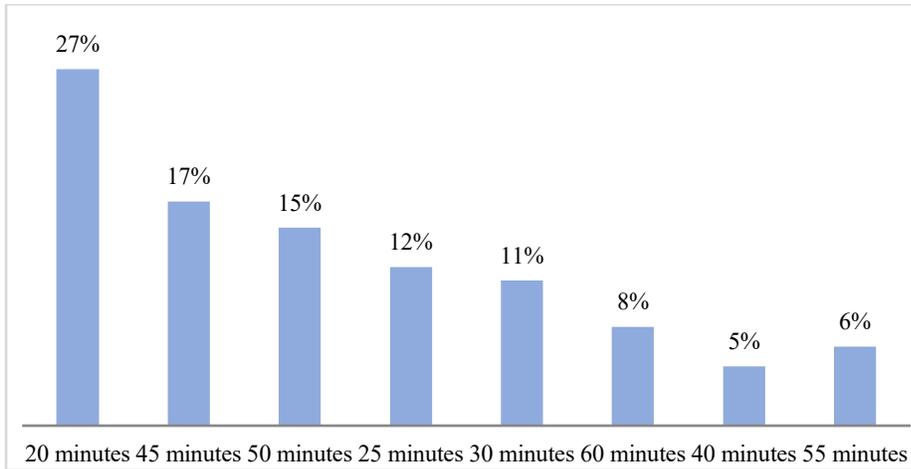
Figure 6.6

Amount of time students have to eat lunch

An analysis of the responses to the question of lunch destinations external to the school

revealed that fast food establishments were the most common place students go for lunch (n=65).

Thirty percent mentioned home as a frequent destination. All places are listed in Figure 6.7.
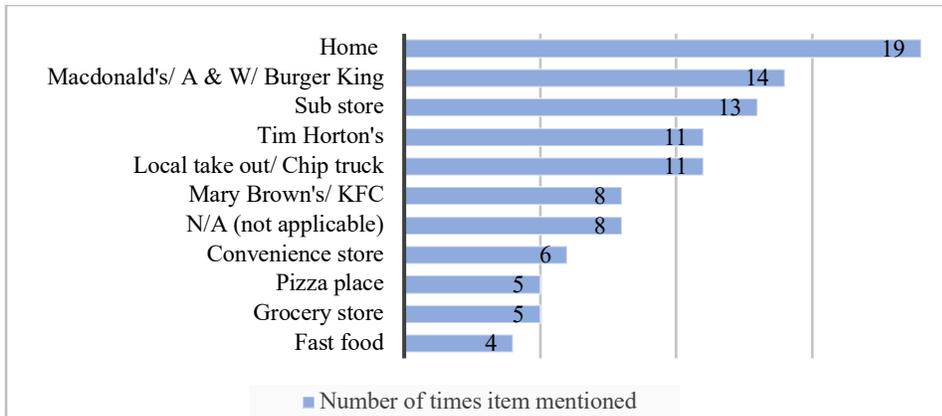
Figure 6. 7

Some of the most popular lunch destinations that students frequent

Some regional variation in responses to lunch destination is shown in Figure 6.8. For schools in the Eastern Region, the most likely destination was Tim Horton's; in the Central Region, it was a burger place. In the Western Region, home was the most common place and in Labrador, a "local take out" was the most common response.
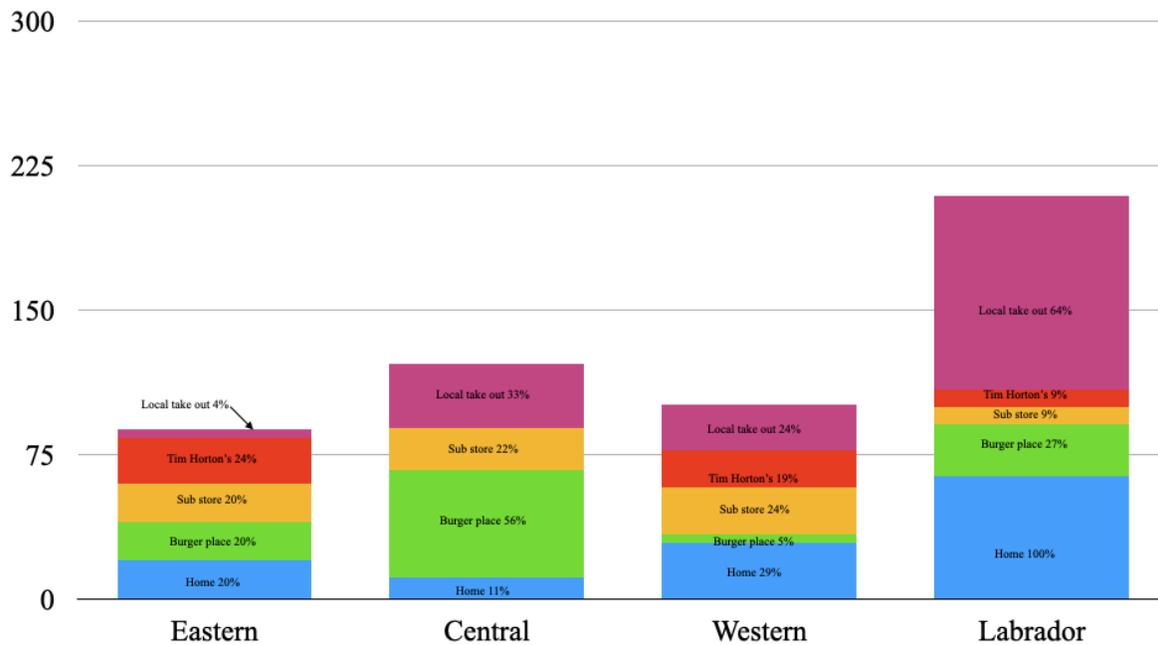
Figure 6.8

Various lunchtime destinations mentioned by region

In the next two questions, principals were asked to provide information about the degree to which they felt "healthy food" was accessible both at school and in the community surrounding the schools. Healthy food was defined as "fresh fruits and vegetables/minimally processed food." This definition was the result of a combination of two descriptions of healthy food as provided in the SFEAT. These were: "healthier items" (such as fresh fruit, vegetables, dark green/organic vegetables, low-fat dairy, whole grains) and "environmentally sustainable food," defined as "minimally processed, locally grown/sourced, organic, seasonal or vegetarian options" (Black et al., 2015, p. 5). Fifty-three percent of principals (36/68) indicated that healthy food was "very accessible" or "accessible" at the school. Labrador was less likely to indicate that healthy food was "very accessible" at school and one school in each of the Eastern and Central regions indicated that healthy food was "not at all accessible" at school.

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When asked about how accessible healthy food was in the community (n=68) surrounding the school 47% (32/68) said it was "very accessible" or "accessible." This indicates that principals believed the school and the community were fairly similar when it comes to accessibility. Further information about principals' impression of the accessibility of healthy food at school and in the surrounding community is found in Figure 6.9.
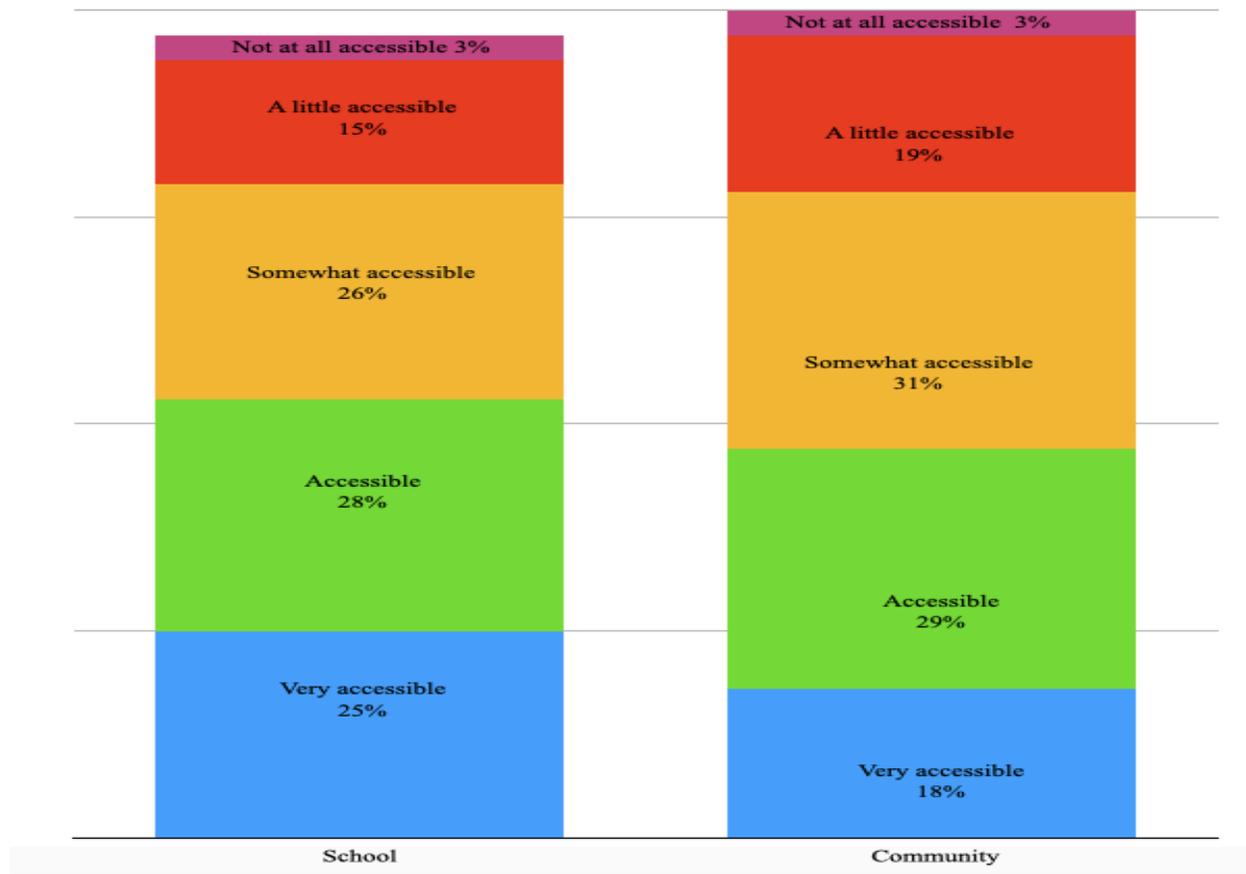
Figure 6.9

Accessibility of healthy food in school/community

When we look at perceptions of healthy food in the community by region, Labrador schools were least likely to report that healthy food is "very accessible" and more likely to indicate that healthy food is "a little accessible." In the Central and Labrador regions, one school from each region indicated that in the community, healthy food is "not at all accessible."

Supports accessed by schools to improve the school food system could include food-provisioning programs, classroom-based gardening activities, health-promotion resources, and other resources connected to the local community or national organizations. When asked about the supports accessed (n=68), the top three were the following. Eighty-eight percent (60 principals) indicated that they accessed the KES program, 63% (43 principals) stated the public health nurse (PHN) was a support, and 56% (38 principals) accessed the SHPLC as a support. A more detailed account of all supports accessed is presented below in Figure 6.10.
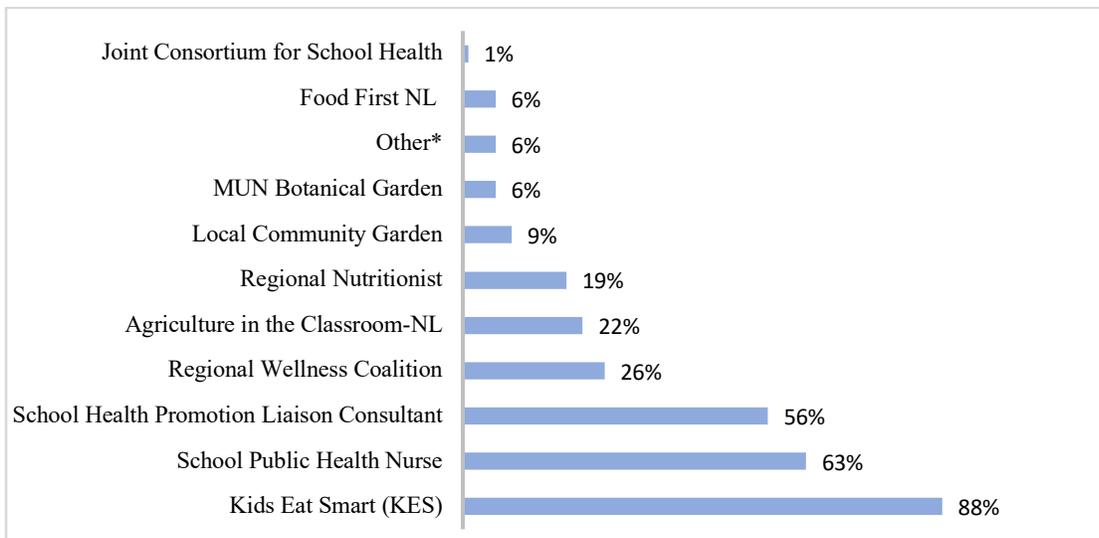
*Other responses (n=3)

| School Lunch Association (n=2) |
| Travelling chef |
| Central Health |

Figure 6.10

Supports accessed to enhance the school food environment

Principals most commonly responded by saying that three different supports were accessed (n=22). Two supports were accessed by 14 respondents and only one support was listed by 12 respondents. One principal accessed nine different supports. Figure 6.11 shows a

breakdown by region of the most commonly-accessed supports. There is a notable variation in the degree to which regions accessed the School PHN. Schools in the Central Region and Labrador were more likely to access the regional nutritionist.
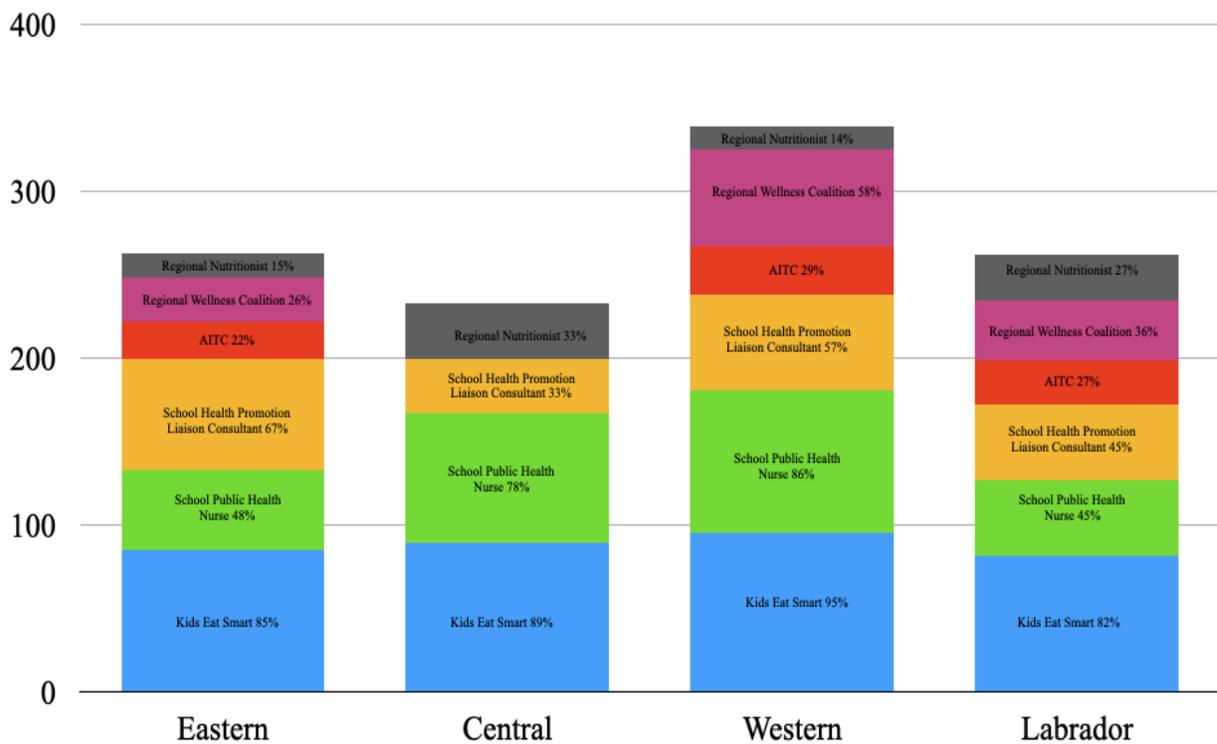
Figure 6.11

Supports accessed by region

6.3.2 Current knowledge, attitudes and needs of educators.

Figure 6.12 lists the most common health concerns (n=64) about students mentioned by principals.

Theme	Number of times theme mentioned
Inactivity	28
Diet	26
Accessibility/ Affordability	11
Chronic condition	9
Impact of parents	4
Mental health	4
Other*	3
No response	4

■ Number of times theme mentioned
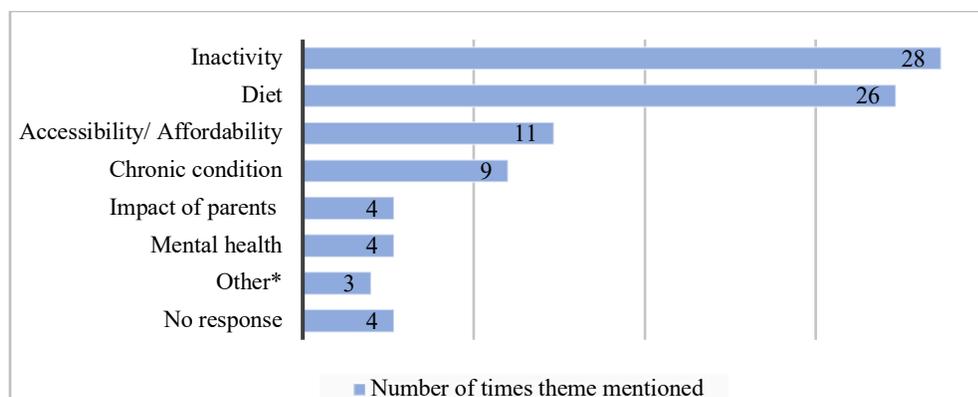
*Other Responses (n=3)

No matter how hard we try, students are still exposed to poor choices. Fruit Loops come in packed lunches. Then other students ask their parents for Fruit Loops! Ultimately, it is attitudes towards healthful food in the general population and how that trickles down to students despite valiant efforts in education.
Lack of space for eating
Inappropriate bathroom facilities

Figure 6.12

Biggest health concern facing students

"Inactivity" and "diet" were the most common items mentioned when principals were asked to describe concerns they had for their students' health. Related to the theme of "diet" were other commonly mentioned concerns which fell under "accessibility and affordability of food" and diet-related "chronic conditions." Combining these responses, we see that concerns related to food dominated. This could be attributed to response bias. where principals are referring to food issues because the survey was introduced to them as a survey about the food environment.

Of responses themed as "diet," there was some variability in how the issue was phrased. "Diet" was the most common item for principals to mention, followed by "unhealthy eating;" concerns related to "fast food/ processed food;" and lastly, concerns about "sugar intake." Responses themed as "accessibility/affordability" were equally split between expressions

referring to accessibility (e.g., "fast food available across the street") and affordability for example "cost of having or buying healthier foods".

Responses varied in the degree of complexity in their phrasing of health concerns. Most respondents listed only one health concern, but there were examples of respondents who listed multiple concerns. Two principals listed multiple health concerns: "mental issues, obesity, high sugar intake, low physical activity," and this response: "lack of exercise, too much junk food, no time to play outside." The listing of multiple health concerns indicated how some principals saw connections among poor diet, a lack of activity and other factors, which have a negative impact on the health of the student population. Mentions of mental health, connections between health concerns and parent influence, and concerns about screen time were also notable.

A higher percentage of principals reported that *student learning* was affected by the quality of school food than those who reported that *student health* was affected by the quality of food at school. Eighty-one percent (54/67) of principals believed the quality of food students consumed at school had an impact on student learning; 70% (46/66) believed the quality of food students consumed at school had an impact on student health. A number of people provided elaborations to their response about whether learning was affected by school food (n= 13). These open-ended question and elaborations on "yes" are listed below in Table 6.2.

Table 6.2

Elaborations on "Yes, student learning is affected by school food"

Foods with a heavy sugar and salt content limit a child's learning and attentiveness
We do not have food available every day at lunch. Our Breakfast Club has been a big success and does seem to have shown better learning readiness daily for students.
Maybe not the quality but for sure by the amount of processed food.
Yes, if they bring their own processed foods.
Yes, poor quality is a problem but lack of food is a bigger problem.
Yes, but the cost of healthy foods for the home greatly interferes with reinforcing the learning.
Often by what is sent from home - not the best
Yes. If they are hungry or not attentive due to lack of food or bring [food] too high in sugar this will impact learning
Yes, and for that reason we do not sell soda, chocolate bars and the like.
Yes, we do have Kids Eat Smart and we offer veggies to grades during the day

One of the principals who responded "no" further elaborated, *"No, it is the quality of food being provided to them at home"* (that is, not at school). Throughout the responses about how school food affected learning, principals expressed concern about the amount of processed food and the quality of food brought from home.

As shown in Figure 6.12, principals seemed less clear on the connection between school food and health. Their answers to the question about whether school food affects student health illustrated a variety of ways of thinking. From the "yes": "obviously - lifelong habits are formed" to the "maybe" and "somewhat - we have them for 5 hours per day but the other 19 hours play a more significant impact." And finally to the "no": "no, but the quality of food consumed at home is a concern."
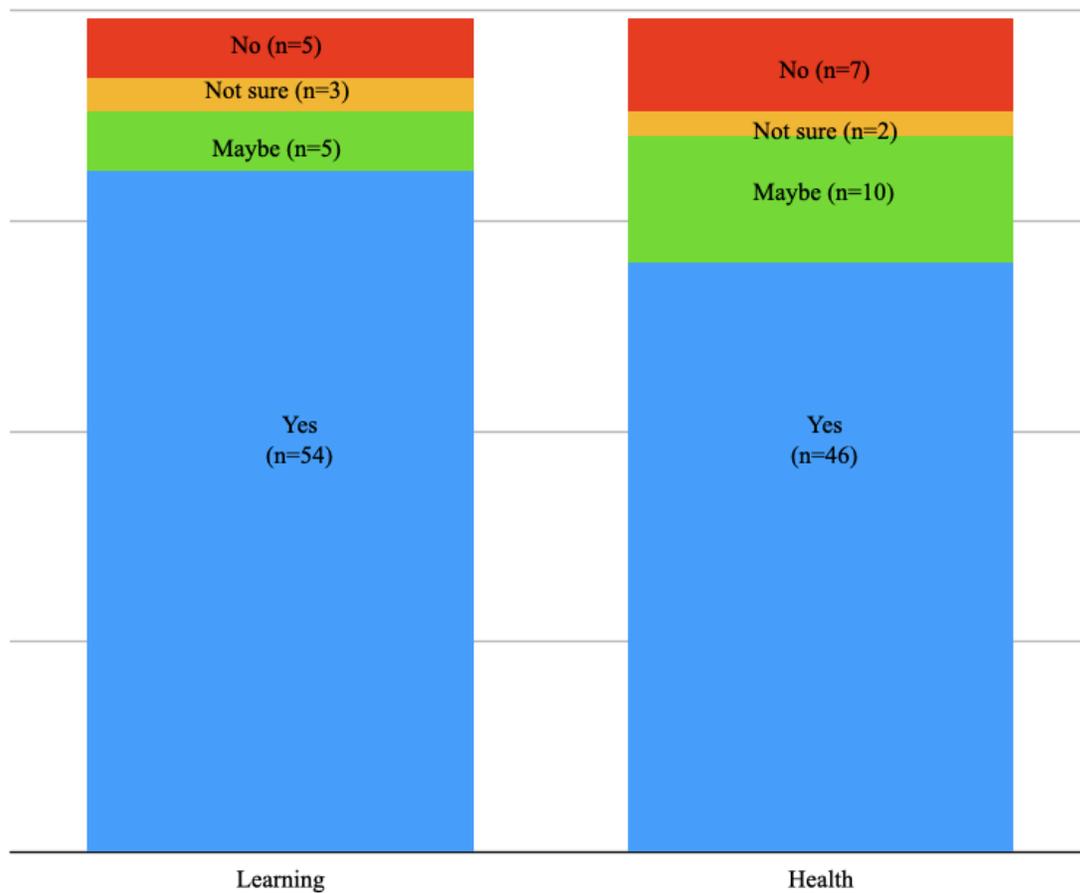
Figure 6.13

Are learning/health affected by quality of foods consumed at school?

To find out how food was integrated into the curriculum, principals were asked to describe links

between curriculum and food (n=51). The most common response was that there were no links

between food and the curriculum, or that the principal was unsure of any links between the two.

If there was a link in the curriculum, it was most often expressed in terms of the health

curriculum or in references to "healthy living," "nutrition/home economics" or "physical

education." Other links made by principals (between food and curriculum) are listed in Figure 6.14.

Item	Number of times item mentioned
Unsure/ Don't know	18
Health curriculum	14
Nutrition	8
Healthy Living	6
Home Economics	3
Social Studies	3
Science	3
No links	3

■ Number of times item mentioned
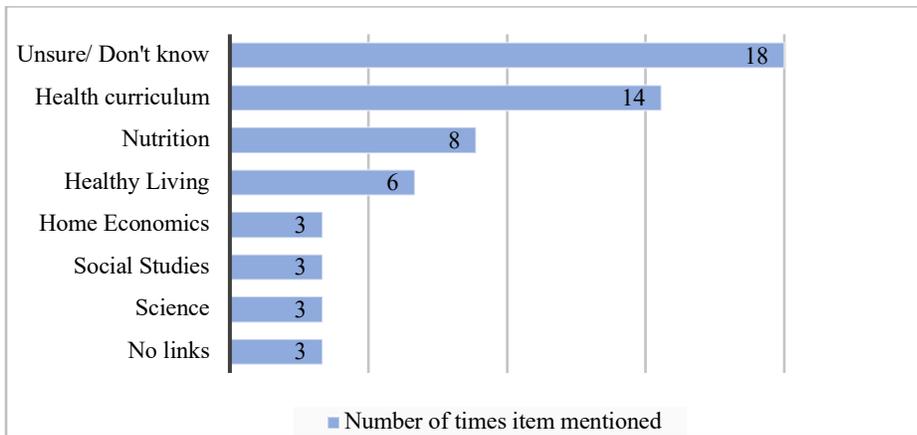
Figure 6.14

Food links being taught in the curriculum

One respondent answered that this question was "loaded" saying that if you want to know what is being taught in the curriculum, consult the Department of Education curriculum guides. This question appeared to be difficult for principals to assess, as the teacher has some freedom in delivering curriculum. The DEECD's program of studies (2014-2015) contains the percentage of time that should be allotted to the different subject areas. For K-12, generally no more than 6% of instructional time is allocated for health curriculum, and food would be only one of the areas covered within that subject area. In elementary grades, 6% of instructional time is allocated to health, and at the intermediate level the allocation is 5%. In high school, health falls under family studies, and is available as a selection amongst "other required credits" of which students require 4 credits (other courses in this category include core French, enterprise education, religious education and technology education). At the intermediate level, home economics is allocated 4% of instructional time (Government of Newfoundland and Labrador Department of Education and Early Childhood Development, 2015, p.11). The low percentage of instructional time provided

for health and related subjects, and the likelihood that the topic of food is limited to the health courses, indicated that food is not adequately being addressed in the curriculum.

Some principals described curriculum connections to food that were outside of the health curriculum. There were mentions of food links to social science, science, religion, NL studies and more. This indicates the malleability of food to diverse curriculum topics. One principal mentioned that healthy eating and active living are included in their school development plan. Others gave examples of students cooking or growing food as part of the curriculum; another principal mentioned links to community service and functional curriculum (functional curriculum is a curriculum focused on independent living skills and vocational skills which emphasizes communication and social skills.)

6.3.3 Integration with food system.

The top three most common food-cultivating programs or initiatives (n=42) offered at the schools include: an indoor-gardening program (52%); an outdoor-gardening program (40%); and farm visits (50%). Less common programs cited were berry picking and foraging (12%) and fishing (10%). Other such programs reported by principals are listed in Figure 6.15.

Bar chart showing percentages:
- Indoor gardening program: 52%
- Farm visits: 50%
- Outdoor gardening program: 40%
- Teaching of traditional food practices: 19%
- Berry picking, foraging: 12%
- Other*: 12%
- Fishing: 10%
- None: 2%
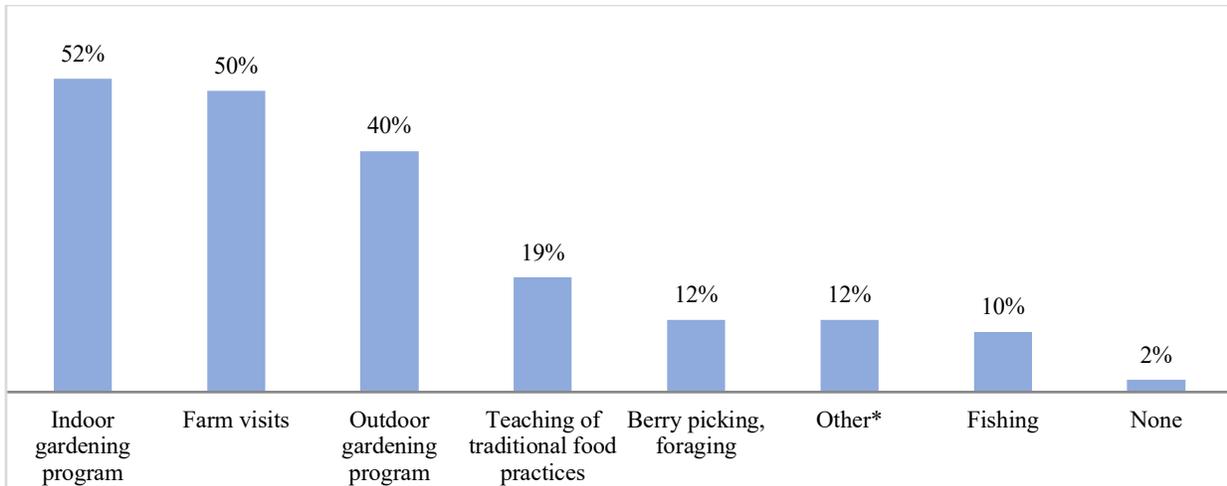
*Other Responses (n=5)

Full time nutrition program
Children will plant seeds but do not grow fruit
Cooking program with local chef
Visits to grocery store with nutritionist
Nutrition class

Figure 6.15

Food related cultivating programs offered to students

Some notable regional differences were found. For the schools in the Central Region, a higher

percentage of teaching of traditional food practices was reported, but no indoor gardening

existed. Labrador had the highest percentage of schools reporting berry picking.

When asked about the existence of connections between food services and local food

production and/or community members (n=66), the most common response was that no

connections were being made, as can be seen in Figure 6.16.
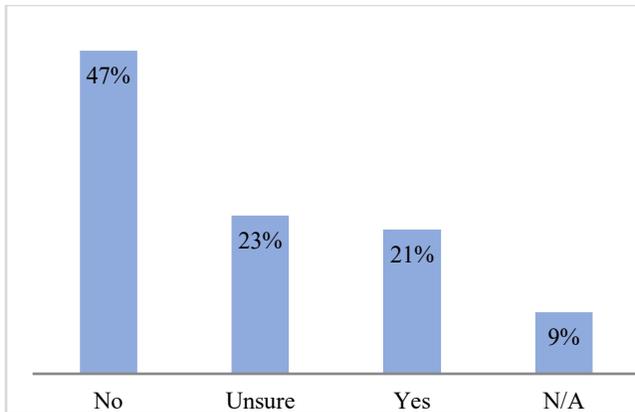
Figure 6.16

Connections made between school food and local food system

Twenty-one percent of principals indicated that they were aware of a connection at their school, and 11 of those principals provided an elaboration. Of these elaborations, the most commonly cited examples were of the food service provider purchasing local food (n=4). The next most common response was a description of the connection between the school breakfast program and volunteers from the community (n=3). Other connections included communicating with parents and connecting with neighbouring schools for food service.

Responses to the survey question exploring connections between food services and local food production/community illustrate the challenge of assessing knowledge about the school food environment. Sometimes connections may exist, but they may not be considered as such or may not be fully integrated. As an illustration: while only a handful of principals mentioned KES as an example of a community-to-school food connection (n=3), we know that the majority of the schools surveyed had KES programs. KES is a prominent example of a school based food program connected to the community because this program is often run by community volunteers. I am uncertain why most principals did not consider their KES program relevant to this question. When we look at regional differences in survey responses, Eastern Region schools were most likely to respond that there was no connection. Unfortunately, I had not considered

the breakfast program when I posed the question of school-community links, whereby, this might have been mentioned in responses.

When asked whether the school had a committee in place to respond to healthy eating, seventy-two percent (49/68) of principals indicated that their school did not have a committee in place (n=68). Those principals who did speak of having a committee provided evidence of meaningful actions being carried out.

72%

28%

No   Yes
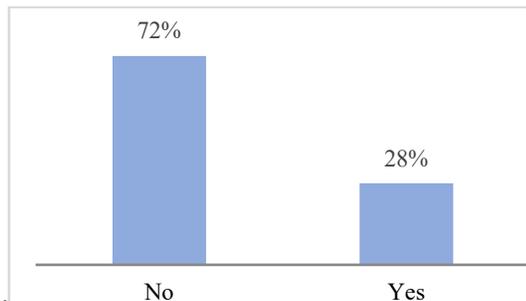
Figure 6.17

School committee in place to respond to healthy eating?

Twenty principals described the actions of the committee in more detail. The actions are listed in Figure 6.18. Three principals noted results from their committee's actions. These included, "attitudes towards healthy eating started to change," "less unhealthy choices" and "water consumption has tripled."
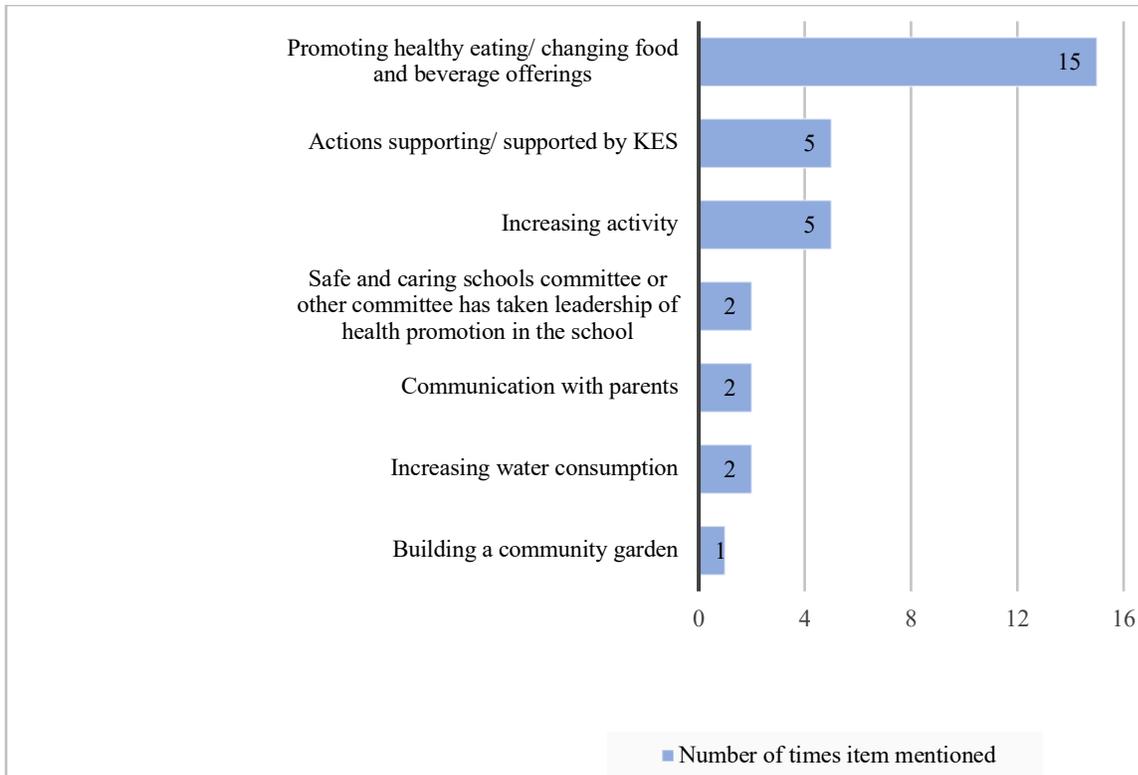
Figure 6. 18

Actions that school committee focused on in the past 2 years

Principals were given the opportunity to add any observations, questions, or comments that had not been mentioned before (see Figure 6.18). Ten people provided comments. The most common comment (n=4) was the need for more resources such as volunteers, kitchen facilities, and access to healthy food. The next most common comment referred to concerns about food sent from home, which was followed by concerns about the economic barriers to good food.
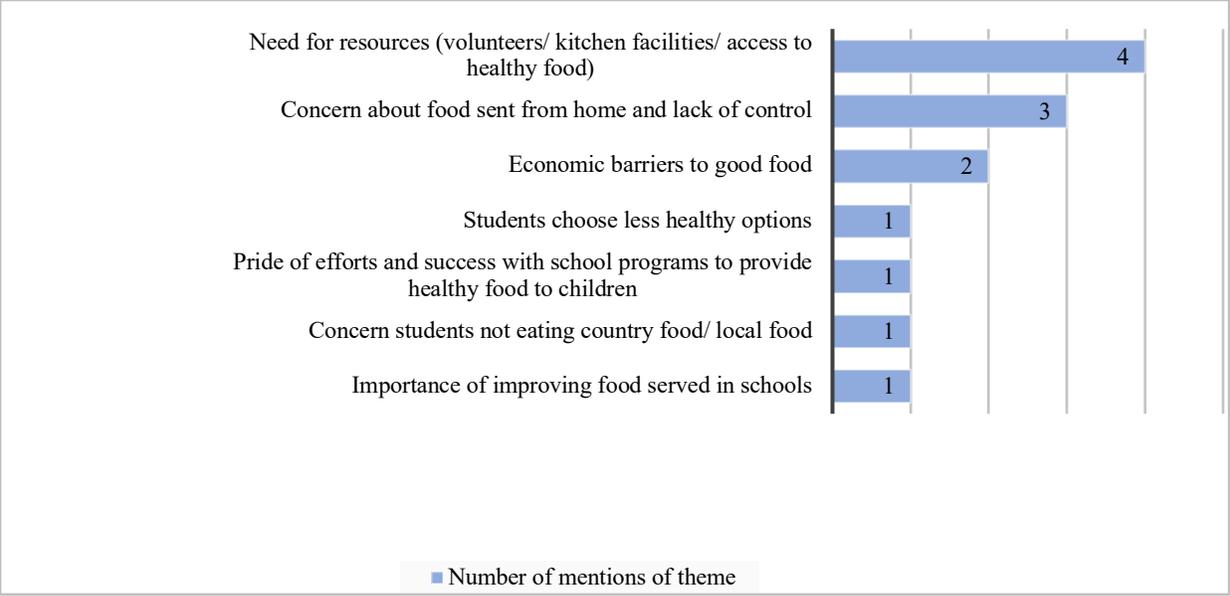
Figure 6.19

Observations, questions or comments not addressed elsewhere

6.4 Discussion: What This Survey Tells Us About the NL School Food System

The goal of this survey was to provide both an updated and newly framed understanding of principals' perceptions about school food in this province by applying systems thinking to the question of NL school food. Principals are the leaders of schools and have been sought out as a critical source of information about school food in past investigations (Coalition for School Nutrition, 2001; Government of Newfoundland and Labrador, 2007; Kendrick, 2018). A systems view of school food was adopted and applied in the survey design to help unravel how school food programs and policies interact with knowledge and needs within the school and the surrounding community—either to support or restrict health and sustainability. To show what I learned about institution changes or lack thereof, over time, I will now turn to a comparison of my survey's findings to previously existing knowledge on school food.

6.4.1 What policies and programs exist in the NL school food system?

Some important things to note about what was known about school food policies and programs prior to my research: provincial SFG existed, school breakfast programs (mainly supported through KES) were becoming more common, and a shift towards understanding the food environment as integrated physical, economic, political and sociocultural phenomena was underway.

My concern with what policies and programs existed within the NL school food system was touched upon in responses to several of the individual survey questions. No question in the survey directly asked principals whether they followed the SFG or not. The decision not to include this leading question among the survey questions was based on feedback from stakeholders. They suggested to me that as principals were mandated to follow the SFG, their responses would be prejudiced and invalid. The principals that did *not* follow the SFG might have been inclined to say they did in spite of the promise of anonymity and confidentiality.

However, since I conducted my survey, the Auditor General's report revealed that 42% of the 36 interviewed principals stated they were unaware that there was a nutrition policy in place at their school. Also, one third of principals surveyed in the Auditor General's report stated they did not understand the procedures to be followed to support the nutrition policy. While it would seem to be an improvement for the province that all schools are mandated to follow a nutrition policy, recent data suggested that the existence of the policy had not improved the foods served in schools (Government of Newfoundland and Labrador Office of the Auditor General, 2019).

Key terms that help portray principals' views about programs and policies within the school context are: complexity, variability and uncertainty. Several results from my survey

contributed insight into the school context. First, through analysis of an open-ended question posed about the foods served at school (Figure 6.3 above), it became evident that in the absence of further nutritional information about most items, results from this question proved meaningless. This was due to the fact that there was such potential variability in the nutritional makeup of the foods mentioned. For example, pizza is one of the most frequently served items. Depending on the quality of ingredients of the pizza, it may or may not meet the SFG. This discovery showed how the current school food policy is not well matched with the social and physical environment (the types of foods available) and the teaching and learning environment (the type of knowledge and supports required for teachers and administrators to support the policy). Schools would require significant nutritional expertise to support, to be knowledgeable about and to maintain the school food policy given the fact that there are infinite possibilities regarding the nutritional make up of some common items like pizza, wraps, and cereal bars. At the same time, in the top-10 list of foods served at school, we see chocolate milk, chips, ice cream and chicken nuggets. These types of foods are examples of the types of processed foods that principals express concern about in comments to open-ended questions throughout my survey. Principals described concern about processed food consumed by students as well as about foods sent from home.

Barriers to healthy school food as reported by principals in my survey include student demand, cost and accessibility. They are similar to those identified in earlier surveys (Coalition for School Nutrition, 2001; Government of Newfoundland and Labrador, 2007). The sustained barriers to healthy food at school in the context of the province's adoption and implementation of a school food policy and in the context of an almost universal breakfast program suggests current policies and programs are missing the mark.

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This survey revealed that more schools in the province have allergy policies and that there is much variability in the types of foods listed as allergenic. The almost universal existence of allergy bans (bans in 88% of schools surveyed) was notable and led to the question of what supports were available to schools to provide accurate and updated knowledge about how to categorize banned foods—or even whether it is advisable to ban foods and if so, when. Allergy bans have been found to give children a false sense of security, whereas schools without bans encourage children to be vigilant around all potential sources of allergens (Cherkaoui et al., 2015). Bans can also seriously narrow the range of affordable, easy food lunch options and result in a tendency to rely on packaged food.

Questions that helped to characterize the food environment for this survey included the places that students frequent for lunch outside of school and also the time given to students to eat. The survey revealed that the amount of time students were given to eat was highly variable. Lack of consistency in the time students were given to eat was an important indicator of the overall lack of consideration given to this topic. Research has shown that the amount of time children have to consume their meal is a significant factor in what and how much they consume (Cohen et al., 2016). This also connects to changes to Canada's Food Guide which now prescribes advice to Canadians on the quality of the eating experience. The quality of the eating experience also connects meaningfully to the establishment of safe and inclusive schools.

Variability in the places students go to eat lunch during school hours was another important insight provided by this survey. The data suggested that the external food environment influenced food behaviours (Acton et al., 2018). Sixty percent of all survey respondents (41/68) listed at least one fast-food destination as a place students frequented for lunch. This response led to further questions such as what do students eat when they visit a fast-food outlet? How does

this differ from what they eat if they visit a convenience store or a local take out, bring their lunch or go home for lunch? Overall, responses to this question highlighted the influence of the fast-food industry and also a potential role for municipalities as potential stakeholders in the NL school food system. There are some regions in Canada where municipalities created restrictions on the development of fast-food establishments within a certain radius of schools (L'Association pour la santé publique du Québec (ASPQ), 2011). Municipal action is an example of cross-system collaboration that could help relieve local school boards of having the sole responsibility for improving school food.

From the question concerning principals' health concerns about the external food environment, we learned about the importance of understanding the external food environment. This finding, hopefully, can help fuel more discussion about how schools can collaborate with external stakeholders to respond to pressure from the food industry. Findings from my survey and those in the Auditor General's report (2019), lead me to question the effectiveness of holding schools accountable for the larger problem of an unregulated food industry. The Auditor General's report focused on the role of principals in implementing school food policy (Government of Newfoundland and Labrador Office of the Auditor General, 2019). However, Auditor General's report did not consider the influence of the external food environment.

Regarding programs in my survey: I found that KES was the main form of support listed by most schools. What the impact was of this program in individual schools remains to be discovered. While no question in this survey directly addressed this topic, at multiple points throughout the survey, the KES program was mentioned by principals as a source of healthy food for students at school.

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There are a number of people and structures in place to support schools to promote health with healthy eating. These include the use of PHNs and nutritionists, region-based Wellness Coalitions, the SHPLC, and other organizations. Recent reports, which emerged after the data for my 2016 survey were collected, produced conflicting evidence about the effectiveness of these above-mentioned health promotion agents in schools. In 2007, a majority of school principals surveyed said they had a committee in place to support healthy schools and schools and stressed the importance of sustaining the level of support they were currently receiving. While the Wellness Review reported on the effectiveness of health promotion efforts, the Premier's Task Force on Improving Educational Outcomes questioned their effectiveness (Collins et al., 2017; Newfoundland and Labrador Centre for Health Information, 2014).

My finding that schools were less likely to have a committee in place relates to a trend known before the conduct of my 2016 survey that there have been many shifts in the organization of public health and public education and variability in services between the regions of the province. According to the 2014 Wellness Review, the involvement of PHNs in health promotion in rural areas of Eastern Health has decreased over the past 10 years and their involvement varies throughout the region (Newfoundland and Labrador Centre for Health Information, 2014). Many schools that participated in this survey reported accessing a PHN (63%). However, my survey, unfortunately, did not ask questions specifically about the role of the nurse within schools in supporting the school food system. There are examples from across Canada where PHNs have taken on the role of overseeing school gardens (Winson, 2012), acknowledging the gardens' important public health role.

There are five regional nutritionists and five SHPLC positions to cover the province's 270 schools (Government of Newfoundland and Labrador Office of the Auditor General, 2019).

The limited numbers of these personnel might help to explain why only 19% of schools indicated that they accessed a nutritionist and only 56% of schools indicated that they accessed the SHPLC. Survey results also revealed much differentiation among regions with reference to accessing the various supports available.

Other school food resources available to schools are the Regional Wellness Coalitions and the JCSH Healthy School Planner (HSP) Tool. The 2014 Wellness Review described the regional Wellness Coalitions as a priority program whose goals are to strengthen partnerships and collaboration (Newfoundland and Labrador Centre for Health Information, 2014). Schools surveyed had varying degrees of engagement with the coalitions and, for example, there were no schools in the Central Region listing the coalition as an accessed support. The Joint Consortium for School Health HSP is an online tool that allows schools to evaluate the conditions of health promotion in their school (Joint Consortium for School Health, 2021b). While the current provincial government plan (The Way Forward) indicates that it will fund 100 schools to use the HSP tool (Government of Newfoundland and Labrador, No date), of the total number of schools surveyed here, only one school mentioned engaging with this health promotion tool. There are examples from other Canadian jurisdictions where the HSP results have been used to evaluate the school food environment (Acton et al., 2018). Whether the information collected for the HSP are to be used by the province for future evaluation and planning is unknown. Food systems supports such as that offered through Food First NL (a provincial non-profit organization dedicated to food security) were not commonly accessed by schools surveyed here.

6.4.2 Knowledge and attitudes.

My survey of school principals was designed to assess knowledge and attitudes about the NL school food system. To assess this I asked principals about the most important health

concerns they saw facing students. A majority described concerns about diet, too much

processed food, and too much fast food. Responses to the question of what health concerns

principals saw students facing also revealed sensitivity to the complexity of the health issues,

with a number of principals seeing that students faced an intersecting mix of health concerns,

such as eating in conjunction with inactivity. The complex mix of health concerns observed by

some principals connects to the intertangled nature of barriers faced to improving the

healthfulness of school food, the complexity of foods served, and overall variability in the school

food environment. A majority of principals did see a connection between student health and

learning and school food.

Previous information about health education and school food indicated that interest in

food-based curriculum exists, but the area of the curriculum—health—where food is most

commonly addressed, is generally not viewed within schools as a priority subject. I discuss this

further in Chapter Seven. This leaves opportunities to explore social or ecological food-based

curriculum beyond health classes in the future.

6.4.3 Connecting to the broader food system.

Principals reported on existing food cultivation programs at their school (52%). This is a

promising entry point for enhanced learning about the food system at school as indicated in the

case study in Chapter Five of this dissertation. Resources are available to support schools in food

provisioning and gardening, such as the LGT and the Wellness Coalitions, and these are

potentially excellent entry points for changes to school food systems.

6.5 Limitations

Responses from my survey provide some insight into the NL school food system while

updating earlier surveys. However, a number of limitations to the survey exist and need to be

acknowledged. At the time of designing the survey, I made the survey anonymous to preserve confidentiality but, in retrospect, being able to link survey responses with school information could have led to a richer understanding about the system as a whole. Connected to this issue is my removal of the responses from the 21 teachers who responded to this survey from this analysis. While the survey invitation asked respondents to limit responses to one survey per school because, since I did not ask for the school name, I had no way of knowing if multiple teachers from one school may have responded to the survey. Of the teachers who responded to the survey (whose responses are not included in this analysis), 19% were from the Eastern Region, 19% from the Central Region, 9% from the Western Region and 52% from Labrador region. The large percentage of responses from the Labrador region indicated to me that it was possible that multiple teachers from one school may have responded. This was the reason that I chose to only report on the responses from principals even though this cut my number of survey responses from 89 to 68. In order to be able to compare my survey responses to the survey responses from 2001 and 2007, I needed to be able to know that each response was from a unique school and from the principal.

The variability of schools across the province increased the challenge of linking survey information back to the school system. There are multiple school boards, different regional supports across the province, different stakeholders, needs and capacities. At the time I developed this survey, I was not aware of all of this diversity. This is an oversight in my process of survey distribution that I discovered after my data had been collected and analyzed. Also, I did not seek the approval from all of the Indigenous governments in the province prior to sending the survey to schools within these governments. When I discovered this oversight, I sent information explaining my error to the Nunatsiavut and Nunatukavut government. Unlike the Innu, these

associations of Indigenous people do not have a separate school board. I learned in this process that since this survey did not directly report on the people from these regions, there was no issue with using information that may have come from some of these schools. However, this is an important lesson for future research about the NL school system. I recommend that the DEECD and NLESD better identify and define the existence of the separate Indigenous governments for any research occurring in schools in the province. Each Indigenous governing organization or government must be independently considered for a truly representative process. More broadly, when considering how to improve school food across the province, regional supports and access to information must be strengthened. Such a consideration must be place specific and responsive to variable regional differences. The results of this survey clearly show how variability between schools was a defining factor in school food. Therefore it stands to reason that more localized learning can adapt to this variability.

As I mentioned in the description of the survey's development, deciding what questions to include in the survey was influenced by efforts to collaborate with stakeholders and attempts to create questions that could be compared with previous surveys and therefore highlight any social changes. The question I included in this survey about barriers to healthy food at school was adapted from the survey of Alberta principals. The question was also similar to one in the 2001 and 2007 surveys. Only later when I was analysing the survey responses did I see that selecting this question (a multiple-choice question) meant that I was restricting answers to the selection of a particular barrier. This meant that in the case of trying to build an understanding of the way principals understood the barriers to healthy food at school, I ended-up restricting my understanding. I missed the opportunity of gaining deeper insights into how principals understood barriers to better food policy; that is, in terms of "demand, cost and accessibility." I

learned from this process the importance of piloting the survey and the process of analyzing

initial results in order to understand the limitations of the questions included in the survey. Had I

done this it may have provided the opportunity for a more nuanced understanding of how current

school food infrastructure, such as KES, the School Lunch Association and private school food

providers are seen by schools to be integrated into the local food system. The findings generated

from the survey left me with the belief that the interconnectivity among school food systems is a

situation best addressed through localized knowledge sharing activities that can respond to the

unique needs of each school community.

6.6 Conclusions

To adequately understand the school food system requires research that is sensitive to the

way school food systems interact (McIsaac et al., 2019). The purpose of my survey was to

produce a snapshot of the multiple components of the NL school food system (including

programs and policies, knowledge and connections to the surrounding food system). It was also

important to be able to connect this survey to previously existing knowledge about the school

food system in order to speculate on how the system has changed (or not). The principles of

systems thinking including iterative learning, collaboration and innovation were used to guide

survey development. The number of interesting findings that emerged from the survey suggest

the need to further develop innovative tools that promote learning and collaboration at the school

level. Survey findings demonstrate how despite the existence of a mandated school food policy

and a universally available breakfast program, NL principals still expressed concern about the

foods students are eating during school hours. The observation from school principals that

students are eating a disturbingly high percentage of unhealthy food combined with ongoing

barriers to consuming healthy food reveal a longstanding condition of malnourishment that dates back to at least 2001.

Another key finding from this survey is that due to the variability and interactivity of components that make up the school food system this is a topic that is perhaps not best understood via a survey. In fact, the complexity of factors including understanding the nutritional makeup of different foods, location of schools, number of students, surrounding community factors, programs offered, curriculum being taught all suggest that knowledge gathering may be part of the problem but also may be a promising strategy for school food system transformation.

Recent research on health promotion in Canadian schools suggests using a continual improvement model that enables and supports health practitioners, local agencies, ministerial units, and other parts of the system. A related suggestion is to use data to achieve more local or school-based decision-making (McCall & Laitsch, 2017; McIsaac et al., 2019). The findings provided by the Auditor General's report for example, while useful in general, may be less useful at a school level because they are not connected to an understanding of how the other programs, teaching and community interactions at the school mediate the foods offered. In contrast, tools like the SFEAT developed by Black et al., and the HSP tool encourage school-level data collection which might help to make the problem of understanding school food in social context more digestible and actionable (Black et al., 2015; Joint Consortium for School Health, 2021b).

The track record in this province of collecting information from school personnel, not adequately analysing the results and then not making whatever information or analysis publicly accessible is problematic. I found that in 2016, the time of the survey, the majority of schools did not have a committee in place to support improvements in the food environment in schools. This was a noticeable change from 2007, when most schools surveyed did have such a committee. In

2016, those that reported having committees in place were able to achieve a number of health promotion actions (such as promoting healthy eating and offering healthy food and beverage options, see Figure 6.18). The successes observed by those schools that did have committees speak to the importance of capacity building at a school level to respond to issues identified by the school. The fact that some principals noted that their "safe and caring" school committees were overseeing health goals is a promising finding and an area for further strategic investment. The currently existing structure of safe and caring school teams throughout the province offers an ideal infrastructure to understand the way in which food system supports interact at the school level to foster equitable health promotion in the province. Connecting plans for school development to school food issues is a promising approach to build on the interdisciplinary goals of school food systems that support health, sustainability and learning.

The next chapter provides additional insight into the NL school food system uncovered through interviews with key informants. In the interviews, I was able to more deeply analyze an important practice uncovered by the 2016 survey, the banning of fish due to allergies. I was able to address in more detail in the interviews, how and why a large number of schools had banned fish. The key informant interviews also focused on actively seeking out understanding from innovative practices with the NL school food system. Interviews with these innovative individuals in the NL school food system provided in-depth information of responsive school food system transformations.

Chapter Seven: "You never know everything, which I think is also very important. There's always lots to learn": Interviews with Key Informants in the Newfoundland and Labrador (NL) School Food System

7.1 Introduction

This chapter presents an analysis of semi-structured interviews (n=34) conducted in 2016. The key informants include multiple actors within the NL school food system including policy makers, teachers and administrators (health and educational professionals), community members and food service providers. The objective of these interviews is to help answer the following research questions about the NL school food system: (a) what food programs and policies exist; (b) what are the current knowledge, attitudes and needs of food system stakeholders; and (c) how do current programs and policies function in the NL context? This chapter is part of a multi-method investigation of the NL school food system also including a case study of a school greenhouse and a survey of principals from across the province.

Research about school food within this country has tended to look at fragmented components of the school food system by addressing only foods eaten or the presence/absence of particular policies (Acton et al., 2018; Tugault-Lafleur et al., 2017). There are, however, examples of new approaches to school food research and new methodologies which attempt to analyse the system as a whole (Black et al., 2015; McIsaac et al., 2019; Rojas et al., 2011). Applying systems thinking to the research process demands the incorporation of new methods and actors to understand interactions. In the following section I will describe how systems thinking was applied to the process of interviewing and analysing interviews with stakeholders in the NL school food system.

7.2 Methods: Key Informant Interviews

Applying a systems way of thinking to this research was informed by the following principles: collaboration, innovation and ongoing iterative learning (Swanson et al., 2012). In this section I will describe how each of these systems thinking principles informed the interview process.

7.2.1 Collaboration.

The key informant interviews were done with multiple stakeholders throughout the NL school food system. Appendix C contains a NL school food system map that provided a guide to the selection of actors and organizations for this research. Interviewees include actors from all parts of the NL school food system including policy makers, teachers and administrators (health and educational professionals), community members and food service providers.

7.2.2 Innovation.

In addition to the actors named above, I also included selected individuals from innovative NL organizations in the school food system. Organizations were defined as innovative when their staff were engaged in multiple aspects of the school food system as defined by the SFEAT (Black et al., 2015) and were potentially playing a role in leading social transformation. Actions included increasing the availability of healthy food, engaging in food teaching and learning, engagement with the community, and engaging in food preparation. The fact that these organizations were working across multiple components of the food system made them interesting groups to include in this investigation. It was believed that they would offer important lessons based on changing conceptualizations of school food as discussed above. The two groups of food system innovators selected for the study were:

1. The LGT program that supports agriculture in the classroom by providing teachers with a grow light, grow boxes, soil, and seeds, and also connects classes with a farmer mentor and provides other resources. At the time of this research there were about 130 classrooms in the province connected to the LGT program. The program was supported mainly by the Growing Forward 2 funding (Canada's five-year long agricultural investment plan, 2013-2018). The program also had received funding from other sources such as the provincial Wellness Coalitions. I knew prior to conducting this research that this program involved growing and eating fresh food; connecting farmers to schools; and linking food cultivation to curriculum. The rising popularity of this program was an added feature that made it an interesting case for this research.

2. The Local Food to Schools group. This group is made up of a number of individuals and organizations connected to initiatives which aim to strengthen the connection between the local food system and the school food system. I came into contact with many of these actors through a concurrent Learning Labs process that was driven by Food First NL in partnership with the Nourishing School Communities project. This was a national initiative that led to local funding for a variety of projects (Farm to Cafeteria Canada, 2016).

7.2.2.1 Data collection.

This research received ethics clearance from the Newfoundland and Labrador Health Research Ethics Board (HREB) in June 2016. Data collection involved key informant interviews and a focus group. Participants were drawn from organizations from across the school food system. In recruiting participants, a balanced mix of the different stakeholders from different kinds of organizations including innovators, community organizations/food providers and health and education professionals and different regions of the province was sought. Key informant

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interviews were scheduled, conducted and transcribed between June 2016 and March 2017. A total of 34 interviews were conducted; three of those interviews were conducted with more than one person. Figure 7.1 describes the number of key informants from each of the different groups of stakeholders.

Questions in the interview guide (see Appendix H) were based on the CSH framework and focused specifically on: (i) how policies and programs supported or inhibited a healthy school food system; (ii) how the social and physical environment supported or inhibited a healthy school food system; (iii) how the teaching and learning environment supported or inhibited a healthy school food system; and (iv) how community partnerships and services supported or inhibited a healthy school food system.
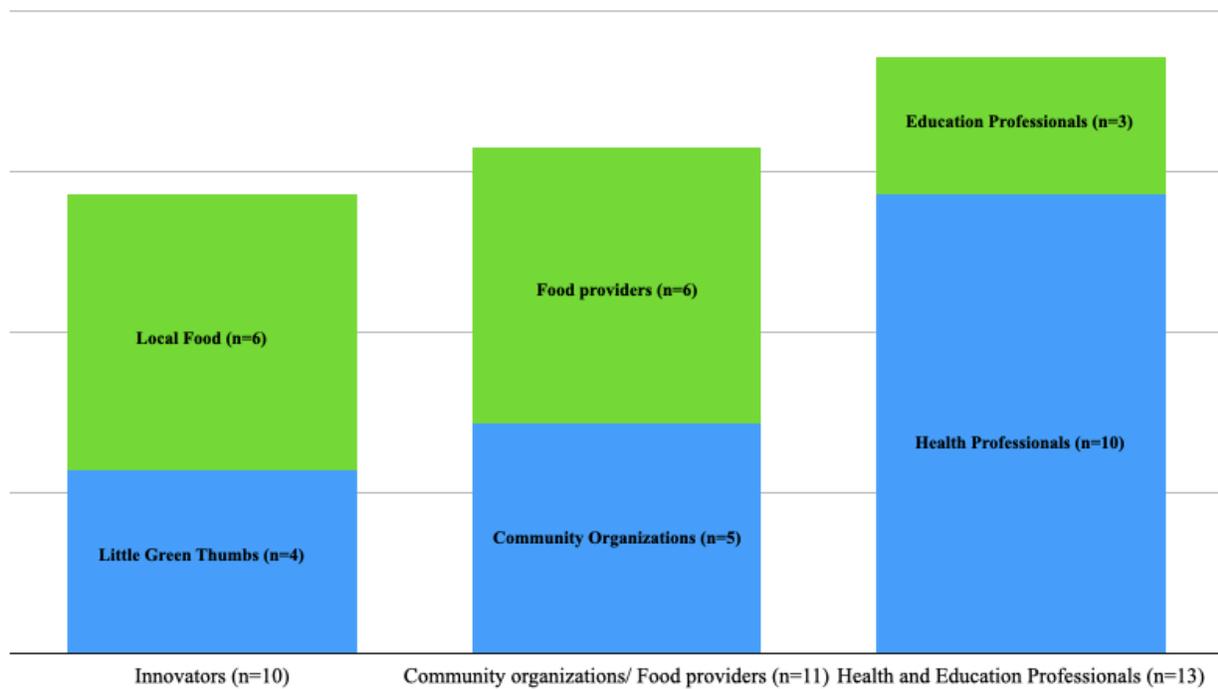
Figure 7.1

Key informants

The 34 key informants included 13 health and education professionals, 11 food providers/ community group representatives, and 10 school food system innovators. These groups are further described in Table 7.1 below. While individuals have been organized into these groups, some individuals fall into all three of these categories and many individuals into more than one.

Table 7.1

Further categorization of key informants

Innovative programs (n=10)	Community organizations/Food providers (n=10)	Health and Education professionals (n=14)
A: Representatives from the Little Green Thumbs program (n=4) • One coordinator • One teacher • One administrator • One farmer volunteer B: Representatives from Local Food-to-School initiatives (n=6) • 3 coordinators • 2 teachers • 1 administrator	A: Representatives from community organizations (n=4) B: Representatives from food providers (n=6) • Three interviews; one of these interviews was held with four individuals	A: Representatives from health professions (n=10) • Eight interviews; two of the eight interviews were held with two individuals B: Representatives from the education profession (n=4)

The group of "innovative programs" was made up of program coordinators, volunteers, teachers and administrators; the group of "health and education professionals" was made up of health professionals (n=10) and educational professionals (n=4); and the "food providers/community organizations" group includes both food providers (n=6) and community organizations (n=4). The groups of "food providers" and "community organizations" were merged as in a number of cases the food provider is also a community organization, or the community organization provides food. This latter group of stakeholders reflects a variety of perspectives, from some of the more established school food providers to community groups that may be more distantly connected to the school food system but whose members are passionate about the topic. I contacted Chartwells, a school food provider that operates in at least 26 schools

(Chartwells, 2020) and received no response to requests to participate in this research. Table 7.2 shows the geographic jurisdiction of the interviewees.

Table 7. 2

Geographic distribution of key informants

	Geographical Region					
	Provincial organization/oversight	**Eastern**	**Central**	**Western**	**Labrador**	**National**
Number of key informants	14	16	1	1	1	1

Each interview was conducted at a location mutually agreed upon by myself and the interviewee. Interviewees were sent a copy of the interview questions which guided the interview process. Although the interview questions served as the basis for discussion, the interviews were semi-structured, allowing for free evolution of the conversation and allowing participants to focus on topics they saw as relevant. As interviews progressed, new questions were created to probe issues raised in previous interviews. Interviews lasted an average of 45 minutes.

7.2.3 Iterative learning/data analysis.

Engaging in systems analysis of the interviews was a process that required ongoing iterative learning. Systems thinking applied to analysis is a new and tricky endeavor (Haggis, 2010; McIsaac et al., 2019). Haggis pointed to the way in which the systems principles such as uncertainty and continuing change, challenged conventional assumptions about carrying out research. The focus for this systems analysis was on the interactions, and in the case of this research I relied on multiple encounters with the data to learn about the interactions between the components of the CSH model. This was the path used to develop an understanding of how the school food system functions in the province of NL.

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Initial analysis could be said to have begun with the creation of the school food system map (Appendix C) as this was the initial setting of boundaries defining relevant actors in the school food system. During the process of engaging in interviews, initial insights for analysis began to surface. When the interviews had all been transcribed by a research assistant, I carefully listened to each interview correcting any mistakes in the initial transcription and continuing to note initial themes. The transcripts were sent to informants who were invited to make any changes or edits to the material they thought appropriate. Two interviewees sent back edits, and the requested changes were made to the transcripts. One interviewee requested to withdraw from the study and have their transcript removed and it was.

To inform the process used to analyse the interviews, I relied on multiple sources which described the process of analysis (Braun & Clarke, 2006; Maxwell, 2012; Ritchie and Spencer, 1994). The feature that I adopted in my own analysis was to undertake a systematic process of sifting and sorting the material. In my case this sifting was informed by the CSH framework. Such analysis is referred to by Braun and Clarke (2006) as a theoretical thematic analysis which is analysis driven by a theory. In my case, I worked with the CSH framework as the theory. Maxwell's description of a "connecting strategy" also helps to describe this sifting process as I was looking at how segments of the data connected with each other within the actual context (Maxwell, 2012, p. 116). Thus the process of identifying themes focused on developing and understanding of the interconnections between the components of CSH. The process occurred through familiarization and interpretation of the interviews. Familiarization with the data was an extensive process in which I began with a hard copy of each transcript, using different colours to indicate how different parts of the interviews aligned with the CSH framework. For example, if a key informant was discussing an issue or observation about school food policy, I colored those

words in red. If the issue connected to the social and physical environment, I coloured those words in blue. Within each component of CSH, different themes emerged. For example, within data surrounding the policy environment, there was a gathering theme of food allergy policy. This process led me to an initial listing of themes which in Spring 2017, I presented to a focus group for discussion. The focus group (n=10) was composed of individuals who had been previously interviewed who were invited to provide feedback on the initial interpretation of the data. The purpose of the focus group was to generate feedback to incorporate into the ongoing analysis. After the focus group, I listened again to interviews, now organizing the interview transcripts according to the three different stakeholder groups: (1) innovative programs; (2) food providers/community organizations; (3) health/educational professionals. For each of these groups, I created maps framed by the components of CSH as a way to connect the key themes, which I further organized by answering the research questions:

1. What programs and policies are offered?

2. What knowledge, needs, attitudes do food system stakeholders have?

3. How do programs interact with place?

In this way, for each of these three questions and interview groups I organized key insights according to the components of the CSH framework. This process allowed me to gain an understanding of how the components of CSH intermingled in ways to enhance or create barriers to the development of a healthy and sustainable school food system. As the analysis evolved, I returned to the interviews to check that emerging themes were a good fit with the facts and opinions expressed by participants.

The final stage of analysis occurred through the process of writing. Through writing I came to understand how the data interconnected and addressed my research questions. I also

came to recognize that systems analysis is an extremely challenging process as there are innumerable potential connections between the components of the CSH framework and depending on the perspective of the analyser, certain emerging insights can connect equally to policy, the social and physical environment, the teaching and learning environment and the community environment. However, a key aspect of systems thinking is that it requires the setting of artificial boundaries. In order to interpret results, I have had to set these boundaries. This setting of boundaries allows for an analysis that focuses on interrelationships and patterns from multiple perspectives (Cabrera, 2006).

To preserve the anonymity of the people I interviewed, any indicators that may reveal a participant's identity have been removed from the text. For example, if the participant mentioned a colleague or organization, this has been replaced by a generalized noun such as "organization."

7.3 Results

In this section I provide an analysis of three themes arising from the interviews, all of which provide insight into how the school food system works in NL. Table 7.3 contains a summary of the themes reviewed below. To describe the themes, I first provide an introductory overview, and then I present the themes relying on the components of the CSH framework: the policy environment, the social and physical environment, the teaching and learning environment, and community partnerships. I illustrate these themes through verbatim quotations. The themes discussed are:

1. conditions affecting the implementation of the school food policy;

2. how values and assumptions impact school food; and

3. how perceptions of the food environment impact school food.

Table 7. 3

Themes from interview analysis

CSH component	Theme 1: Conditions affecting the implementation of the school food policy	Theme 2: How values and assumptions impact school food	Theme 3: How perceptions of the food environment impact school food
Policy	1. Lack of province-wide school food policy 2. Consolidation of school boards	1. Values and knowledge that impact policy 2. Cultural importance of fish de-valued whereas allergy policy highly valued	1. Reflection on how different policies shape food environment: cod moratorium and allergy policy
Teaching and learning	1. Principals' lack of training resources 2. High stress	1. Traditional vs. alternative take on food in curriculum 2. Health low priority on curriculum hierarchy vs. importance of social emotional connection to food	1. Discussion of innovation and food system connection to curriculum
Social and Physical	1. Easy access to fast and cheap food	1. Connecting unhealthy eating to equity	1. Understanding of societal shifts requiring connection to food system
Community	1. Development of alternative strategies to navigate food contracts	1. Role that community partnerships can play in bringing food systems thinking to the curriculum	1. Ecological connections offers insight to limits in understanding long-term consequences of unhealthy eating

7.3.1 Overview of themes.

The first theme focused on the influence that educational policy and the food environment had on the implementation of the school food policy. This influence was connected to the teaching and learning environment and the social and physical environment through things, such as time pressures inside the school and pressure to compete financially with regards to needs of food providers. Multiple factors interacted in ways that impeded the collaboration that is a necessary part of school food policy. On a more positive note, a broad consensus existed amongst key informants that the current situation needs change.

Responses clustered under the second theme described the existence and influence of contrasting views regarding the value of school food seen across the components of CSH. To

explore how values influence policy I delved into discussions that arose about the food allergy policy. A key aspect of this theme seen throughout the other components of the CSH framework, was the different ways that values interconnect school food with the social-emotional climate of the school and educational outcomes.

The third theme focused on the different ways in which key informants described the food environment in this province and how those perceptions connected to the school food system when viewed through the components of CSH. Consideration was given to how some perceptions of the transformation of the food system among the interviewees fuelled a deeper systematic approach to teaching about food in schools.

7.3.2 Theme #1: Conditions affecting the implementation of the school food policy.

7.3.2.1 The policy environment.

Two main policy environment issues connected to the first theme include: (a) the lack of a province-wide food policy and (b) the impact of school board consolidation. The discussion of the policy environment came predominantly from interviews with health and educational professionals. The lack of a province-wide food policy had both practical and symbolic impact as it was interpreted as a sign that healthy eating was a low priority within the district:

> no one cares. That's another discouraging thing; you do all this work and think OK, policy is there, it's supposed to be followed, that's the binding thing you know? The principal's responsible and everything. Nobody really cares. (5, Health/Educational Professional, p. 13)

Key informants described how a new policy had been drafted for the newly consolidated district but was slow to be adopted (still had not been adopted by the winter of 2021): "So the healthy eating one [policy], they are still just following old policies, and physical activity they

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are still following the old policies" (5, Health/Educational Professional, p. 10). The "old"

policies referred to here would be the healthy eating and physical activity policies from each of

the previously existing school districts (existing before consolidation). This meant that at the

time of these interviews, different regions of the province were following slightly different

archived policies. While these policies do not differ substantially, professionals who helped to

draft a new province-wide district policy interpreted the slow adoption of a province-wide policy

as a sign that food policy was not a priority.

Second, the process of consolidating the school boards was perceived to have led to

organizational change that hampered the collaboration required to support the school food

policy. This observation by interviewees was also reported in the Auditor General's report as

discussed in Chapter Four (Government of Newfoundland and Labrador Office of the Auditor

General, 2019). From the interviews, I learned that infrastructural changes, such as changes in

key positions within the board, may have made it more difficult to implement policy at a school

level as is described here, "[individual] was a program specialist for healthy living working for

the school district. They developed a lot of policies . . . but that position disappeared" (28,

Health/Educational Professional, p.12).

7.3.2.2 The teaching and learning environment.

The two issues that connect to the first theme are: (a) a described lack of training and

resources amongst principals to enforce the school food policy and (b) the ripple effects of high

stress in the teaching environment. In reference to the first point one participant stated "do we

have the structure and the funding? Because it's unfair to say to a principal you got to be the

gatekeeper for what kids eat" (28, Health/Educational Professional, p.12). 2) In reference to the

second point, the ripple effects of high stress, the connection between the school food policy and

the teaching and learning environment is that policy is ultimately enforced at a school level by the principal and was viewed by some to sit "on the principal's shoulders" (5, Health/Educational Professional, p.14).

One interviewee suggested that principals lacked training or resources to implement the school food policy: "I was never taught in university . . . how to deal with a food contractor. But yet it's a big part of your operation in a school, right? They're a business for profit. So they're going to cut every corner they can to make money" (10, Innovative program, p.7).

An increasing amount of stress amongst teachers was described by many key informants. The issue of stress could be linked to all dimensions of CSH but particularly to placing responsibility for the implementation of policy on the shoulders of people who are already under stress, "I do know that I'm hearing more stress stories. Teachers are way more stressed. . . . I think too much is being expected of teachers" (24, Community organization/Food provider, p.8). The impact of stress within the teaching and learning environment could even be seen to trickle into the administration of lunch time. For example, one interviewee observed that in some schools, students were not given enough time to eat:

> The administration is very much geared towards getting them in and getting them out. You don't have to sit there like robots but not far off from an outside perspective. Boom boom, boom, eat go, come on, eat, eat, eat, go, go, go. And you think, my gosh, what is that, what message does that send to kids? (3, Community organization/ Food provider, p.12)

The principal (trained as a teacher) is responsible to manage the food service and this was described as an additional chore that many principals/schools did not have the time to deal with:

My schools are losing their cafeteria service, that's a big thing, the principals in the smaller schools who have cafeteria service, they'll do anything to keep them, because they feel if the cafeteria service leaves then they'll be doing it themselves . . . they don't have the time. (15, Health/Educational professional, p.8)

7.3.2.3 The social and physical environment.

The time pressure in schools described above could be seen to interact with the food environment in that the primary targets surrounding eating and serving food appeared to aspire toward fast and cheap food. Food serving was reduced to a task that got in the way of the real business of the school, as described in the section above: "eat eat eat, go go go." Thinking about food provision in school in this way connects to the sentiment from the research participants that food providers tended to provide unhealthy food as a way to stay in business, "the healthy option is the more expensive option, so it's not necessarily something that is easily offered by caterers who need to make a profit" (17, Health/Educational professional, p.2). It was commonly observed by key informants that catering companies are struggling to make a profit which many understood to be the reason the companies tended to offer the cheapest food possible. "Across the street, there's big signs, pizza and a pop, it's like two dollars. There's nothing at school that cheap, two bucks. They have the most beautiful brand-new cafeteria and the students aren't eating there because you can go across the street. So that's really tough for the vendors" (15, Health/Educational Professional, p. 30).

Key informants observed that the competitive food environment was a significant barrier to healthy food consumption: "the society we live in makes it too easy for them to get foods that are generally referred to as junk foods. Lot of things with salt, lots of sugar, you know, pop and

chips and things like that" (14, Innovative program, p. 4). One key informant discussed their perception of the way that unhealthy food culture and an unhealthy food environment relate:

> What facilitates unhealthy eating compared to healthy eating? . . . There is some cultural something here . . . It just carried forward into those attitudes. Business is a huge part of it as well. But that's everywhere. What drives unhealthy eating especially the consumption of sugar drinks—it doesn't take a very big genius to figure out that. It's everywhere you see it and it's cheap as dirt. I mean what are people going to do? (3, Community organization/Food provider, p. 10)

7.3.2.4 Community partnerships.

Consideration of the catering companies and competitive food service providers as key community actors in the school food system was a critical strategy described by some innovative key informants. They provided insight into a new type of partnership manifested in one school that was attempting to build a farm-to-cafeteria program. This school put extra resources into providing a salad bar and described the importance of being proactive in writing the contract with the school's food service provider. The changes that the school was attempting to make to their food service relied on a partnership and communication with the food service provider:

> The meetings with [the food service provider] and negotiating contracts has been an exercise and everyone has smiles and says yes we're going to do this, but not actively, and then we as a school didn't necessarily have our act together and say this is what we want, because we didn't know that's what you needed to say . . . the contract we need to sign with [the food service provider], we need to be a little more proactive about what we want from the salad bar, this is what we want the salad bar to look like, this is what we want the food to look like at [our school]. (9, Innovative program, p. 4)

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This example provided insight into how, in one case, innovation in resources and tools helped the school to navigate a different sort of collaboration with the competitive food industry. Such collaboration paved the way for a food service that met food industry and school needs.

7.3.3 Theme #2: How values and assumptions impacted school food.

7.3.3.1 The policy environment.

Three varying views presented below show different visions of the role that schools should play in supporting healthy eating. In the first quotation, a key informant described how the main role of schools should be limited to improving educational outcomes:

> why are we the ones responsible for the lunch program? And why is it that we have to provide breakfast? . . . we are always pulling away from parent's parental responsibilities . . . schools become the answer to everything. So when the PISA results come out or some criterion referenced testing . . . when those results are released, we are on top of schools, "the kids are not performing" . . . Now, I know student learning is connected to healthy living and all that sort of thing but I guess where I'm coming from is that it's difficult for schools to do all of what they're expected to do. (28, Health/Educational professional, p. 4)

The views expressed above, which suggest that schools need to prioritize their role to perform in testing and measurement and that food should remain a concern of the home environment, differ from the following quote. In this quote the interviewee talks about how school food programs are a fundamental part of the school, not only providing children with access to food, but also building the school's place in the community:

> I think there's also a role for schools in positive role modelling. I don't think it's their mandate for health, but they are part of the community, so the more they can help support

programming even around food security . . . I think it's an important role the school can play. (29, Health/Educational Professional, p. 3)

While most interviewees observed that food provisioning programs were necessary to fill a gap within the school setting, one interviewee, quoted below, felt that breakfast programs were not enough. They felt that school food needs to link to curriculum, which helps connect planetary health, community health and child health.

School food at this time seems to be institutionalizing food banks . . . We used to be that Canada, we didn't have so many hungry kids, and we didn't need school meal programs to feed kids. I think school food should be about feeding kids intellectually, food literacy, and not food literacy to reinforce the status quo; food literacy so children really understand their food system and local foods, and healthy foods . . . I think the teachers should be the experts in developing curriculum, and that curriculum should be reinforcing lessons that are going to create a healthy planet and a healthy community, and a healthy child. (30, Innovative program, p. 8)

To delve deeper into how these different values impacted policy implementation, I examined another school food-related policy, the allergy policy, also called the "anaphylaxis policy." A school allergy policy refers to the policy that bans foods from entering the school due to the presence of students who have severe allergies to these foods. Asking key informants about their views on the allergy policy emerged as an intriguing way to understand people's views on the way schools can regulate the food environment via a policy. The allergy policy asserts that principals should balance the needs of students with allergies with the needs of students in the general population (Government of Newfoundland and Labrador Department of Education and Early Childhood Development, 2020). Schools have to work with parents and

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students to uphold the allergy policy and "sweeping decisions happen because it's a way to make sure that the child is safe" even though it is recognized that "there's cost factors on the side of that for the rest of the population" (26, Health/Educational Professional). The efficiency with which schools control foods entering the school based on allergies can be contrasted with the much more difficult time schools have in making similarly sweeping decisions to communicate/support/enforce a transition to healthy foods at school.

As a consequence of the allergy policy, a number of foods have been effectively removed from the school environment. Some key informants stated that there was a lack of understanding about allergies and that, in some cases, fear of the potential of a life-threatening allergic reaction led to the uptake of allergy bans with a disregard for common sense. "[T]hey had one kid who had a kiwi allergy, so [in] the K-3 school nobody was allowed to bring in strawberry kiwi juice. How much kiwi do you think is in a strawberry-kiwi juice box? None." (31, Health/Educational professional, p. 11). In the next quote, the opinion that allergy bans prevented the majority of students from accessing healthy foods was presented.

> My mother-in-law is a teacher in [a country] which doesn't have these food allergies either. She was at my house and I was trying to figure out what to give my daughter the next day for lunch. [I said] "We can't give any tuna and can't give any peanut butter. She said "Why not?" [I said] "There's food allergies. If a child comes in contact they could die. And she said, "Well he shouldn't be at school" and I said "What?" [And she said] "No, because it's affecting the health of all the other students." I had a parent call me yesterday and say you know what, in a democracy when there's 600 students in this school and there's one allergic to tuna, could that student perhaps eat somewhere else? (15, Health/Educational professional, p. 22)

Another key informant described how schools across the province had eliminated fish as a source of food in the school environment. The cultural value of fish as food was being downplayed in favour of placing a high value on safety for all.

> They've got fish but are not preparing it in their school. Very odd kind of thing. So, their parents may work at the fishery, work at the fish plant, but they're not eating fish at school. Yeah, it's kind of a very weird thing. Almost foolish, isn't it? You're not eating the food that you're making a living from. Of course, the oddest thing is that it is the cultural food of this province: codfish. So we're losing a huge part of our culture by not introducing our children at a young age on how to handle fish, process fish, cook it, prepare it, appreciate it, and I mentioned before, I don't think we're becoming a province of ranchers, so where are we going to get our protein? Talk about sustainability that's again it's going to go back to the sea. (11, Innovative program, p. 4)

There were other examples provided to me of schools that were able to offer students fish:

> There's schools in Corner Brook where for lunch they serve fish sticks—right? I know that's probably a process, but they serve fish sticks. (4, Community organization/Food provider, p11)

One of the biggest distinctions between the allergy policy and the school food policy seems to be the clear vision of the risks (and liability) associated with a food allergy, which contrasts with the dispersed and less clear risks (and liability) of unhealthy food.

7.3.3.2 The teaching and learning environment.

The curriculum generally-speaking emphasized a view of health that stressed individual decision-making versus a view of health that stressed how social circumstances and equity

determine health outcomes. This is demonstrated in the following quote where the key informant describes that the message of healthy eating in the curriculum is focused on knowledge and decision-making.

> hopefully those decision-making skills will kick in when you're put in that situation where you'll be given a choice to consume or not consume, or eat or not eat a particular food . . . (7, Health/Educational professional, p. 15)

The implication of this quote is that decision making skills (the outcome of the health curriculum) are the root cause of unhealthy choices. This view fails to connect to the way in which the food environment itself influences health. Another observation about the health curriculum is the perceived irrelevance of the health curriculum. I learned from a few informants that almost no teachers received training in health education.

> [T]hey skip health because that's when they go to band, because health isn't that important, or they need extra time because they have math stuff coming up so they skip health and do math . . . it's like health gets the back end all the time
> . . . A bigger shift needs to happen, a paradigm shift in terms of people thinking that health is important. (5, Health/Educational professional, p.8)

7.3.3.3 The social and physical environment.

The long-term health ramifications of food consumption, the intricate ways that eating habits correspond with other social determinants, and the different ways in which people understand the relation of foods eaten and long-term consequences are critical to visions of school food in the social and physical environment. One reason for the continuation of unhealthy eating practices, a perceived lack of understanding of the long-term consequences, was given by this informant:

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I think the unhealthy part of it is pretty intangible too. Like what does it mean? I don't

want that [food] today because it's unhealthy. For someone who is weight conscious that

may be very practical, but most people don't think about it in terms of long-term health.

(3, Community organization/Food provider, p. 10)

In the following quote, this health/educational professional spoke about the different opinions on

what foods met the guidelines.

A lot of schools said what they're eating was fine . . . because I think the staff aren't

aware, the staff are probably eating the same thing and they think it's fine . . . and they'll

go "oh yeah, we're following the school food guidelines, we're offering healthy choices"

and then you go in and see the hot dog buns in the freezer and now we have ice cream

every Friday. (15, Health/Educational professional, p. 1)

Most key informants were sensitive to the deeper issue that a family's food choices were often

related to cost and access and that it was important to not send home critical messages regarding

healthy eating to an already vulnerable population. The key informant below listed ways in

which healthy food at school interacts with the social-emotional climate of the school: pressure

to conform, social inclusion and equity.

[O]nce you start setting the stage for children, typically the K to 6, about healthy eating,

healthy food, healthy choices, [you have to be conscious that] there are a lot of children

who live in poverty and live in food-insecure homes and they're not bringing healthy

choices to school or they're not bringing any food at all to school . . . if you put it in the

curriculum, we're telling the children this is what we want you to do, you should be

doing this, we have to be very conscious again, we talk about mental health issues when a

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child feels left out, feels like I'm not part of that, embarrassed, I'm not coming to school

because we don't have any food. (4, Community organization/Food provider p. 20)

The key informant quoted above suggested that messages of healthy eating may make students

feel ashamed, even to the point that they would stay home from school. This understanding helps

to link school food directly to two very topical and tangible educational problems: student

absenteeism and school climate.

7.3.3.4 Community partnerships.

Many people I spoke to that were connected to community organizations or various

innovative food programs, tended to take the stance that there was a lack of depth in the

curriculum. The curriculum was described as fragmented and overly focused on measurable

outcomes. Some examples of this are gathered in Table 7.4.

Table 7. 4

Quotes from multiple key informants critical of the curriculum

(18, Community organization/Food provider, p.12)	"Maybe the courses we teach on health . . . maybe it's not registering . . . cooking class should be in every school."
(9, Innovative program, p.12)	"I think we are in a very unfortunate educational moment, where everything is tied back to some outcomes . . . they're not as concerned about healthy food, understanding a place, appreciation of what is social justice, what is economic justice . . . we've narrowed it down to the next test."
(1, Community organization/Food provider, p.13)	"We're teaching them simple things rather than complex stuff. These kids are smart and we're not allowing that to show through; they are not figuring out for themselves, what interests them. We're telling them what should interest them, and it doesn't work that way—too structured."
(20, Innovative program, p.5)	"You know, the curriculum that we have to follow in schools, that's designed by the department and through the district and brought down to teachers, we need it. However, we have to get far more creative in how we present it to students."

Certain community partners were supporting a more complex engagement with school

foods. This engagement connected the varying critiques as expressed in the table above with

what is taught in school. A practical, experiential learning connected to school food was described below.

> [The classroom garden] is definitely promoting inquiry-based learning. Because you never know what's going to happen, and there's so many variables . . . We don't always have the answers. That's huge; children have trouble just trying to give an estimate, because they feel they need to get that exact number. To make an estimated guess, "am I right, am I right?" I believe the garden really helps with that. We plant our seeds. We don't know if they're going to germinate. If they do germinate there's no guarantee that that plant is going to survive and produce the fruit we think it might, or it gets so far and then something happens, and you know, you can't go be upset, "my peas are dying." That's a part of life and we need to look at that and talk about that and celebrate that just as much as we celebrate getting a bean on a plant, as we do as that bean plant dying, versus someone might say take that bean plant out before the beans come and put another one there. No. Or, even as teacher, I've had an experience with a teacher in the garden and who felt that plants dying was a reflection of them as a teacher. No, that's all a part of it. So, I think it has really changed that part of the classroom. It's always there, it's a center of the classroom; it's a conversation point. Children, some children do their best writing in their journals of Little Green Thumbs. There's been children in different classes making the comment I'm finally writing about something that's true, or I guess they mean something that's meaningful, or I finally have something good to write about I've heard several times. (27, Innovative program, p. 12)

The key informant quoted above described how an indoor classroom garden connected with learning and self-expression. Below, the same informant spoke about connections among their indoor garden and inclusion, exposure to new foods, math and creative thinking.

> I have a boy this year with autism, he will often go and just sit in the garden. He just sits there; he's good as gold. And his behaviour changes. He knows to go and sit there; he knows that is a spot for him. He sits there and he's just talking, whatever he might be saying, and looking around. Whenever he's ready he'll come back and do whatever. So, I had another child two-years ago, only ate white food. Even French fries, would only eat the inside of the French fry. The mother would come after school and watch him eat lettuce out of the garden. But they'd go down to the supermarket, same leaf lettuce there, he wouldn't buy it because he hadn't grown it himself. But because he grew it, now he was eating cucumbers and was eating lettuce and he was eating beans; he wouldn't eat the tomatoes . . . It's always changing; you can do your math, measuring things, you can be charting stuff, graphing things, it's all hands on, which is very important for learning at any age, I believe. You never know everything, which I think is also very important. There's always lots to learn. It creates conversation, it creates writing opportunities, math opportunities, just the inquiry, the I wonder. (27, Innovative program, p.12)

This informant described the complexity of learning that can come from an indoor garden, an initiative in school food, pointing the way schools can provide learning opportunities for students that connect food with multiple facets of existence and to achieve better inclusion.

Many of the food system innovations were motivated, as in the case of the key informant below, by a philosophy that if individual students take part in activities involving food cultivation, they will be more likely to appreciate food and food systems and their place in these.

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Just trying to get them to think about where their food is coming from; the whole

program is around it, and I think a lot of them go home with a better understanding of

eating local, fresh is better . . . it's all getting them thinking about food. Not just from

where it's grown, to eating it, to what happens when we waste it, and relating it to climate

change, and stuff like this. . . . The teachers that come . . . they are blown away by the

fact that we have almost no food waste. . . . And so I just say look, we can do what we

try—children and the teachers, time and time again, say we wish we could do this in

school, because I know there's a lot of food waste in schools. It's a culture here, isn't it?

That you're allowed to waste food. I think the children struggle, wherever they're eating

lunch, with peer pressure, what's okay to eat and what's not okay to eat. (24, Community

organization/Food provider, p.6)

The lesson in food and food systems offered by the community organization/ food provider in

the above quote illustrates the way in which community partnerships were expanding students'

visions about food and school food.

The final part of the quote referred to the importance of peers, and the use of meal time at

school as a chance to instill norms. This topic was rarely discussed in interviews, but was an

important aspect of the school food system which linked to the subject of the previous discussion

on learning about and enacting equity at school through food. The informant quoted below

provided an anecdote about peer pressure at a school where processed foods were visualized as

normal and healthy foods as abnormal.

Another parent told me. It was a parent of the kid who got made fun of for eating green

pepper. . . . They'll have pasta, because it's spinach and olives and pesto and they love it.

. . . They eat all of these different foods. Anyways, my kids are all eating it and my child

just came home recently and said, "Mom, I got made fun of, they said it [pesto] looks like slug poop." [And I replied] It's just pasta, it's a different shape and yeah they'll make fun of you for that. The thing is, I've had adults say to my kids, "Ew, gross, what's that?" You're an adult. (15, Health/Educational professional, p.17)

7.3.4 Theme #3: How perceptions of the food environment impact school food.

7.3.4.1 The policy environment.

Conversations about the local food environment often brought forth reflections on the past NL food environment, "I grew up having fish for breakfast and it was wonderful" (4, Community organizations/Food provider, p. 11). Another informant described thinking of their experience growing up in rural NL in the sixties and early seventies, "We grew our own vegetables; we were pretty much self-sufficient. And you had to be" (20, Innovative program, p. 1).

When we consider the following informant's description about the quality of fish accessible to students, it conjures the image of a healthy food environment that can be contrasted with the more dominant view of an unhealthy food environment characterized by processed foods.

> We're very lucky here and it's not much wonder that we have such healthy fish, when we catch them, they are in really good shape most of the time. You go to places off the New England coast or areas like that and you have to watch what you are eating, it can "glow in the dark". (1, Community organization/Food provider, p. 13)

> Two policies, the moratoria on fishing Atlantic groundfish (often called the cod moratorium) and the allergy policy (discussed above), combined to reduce the likelihood that

fish, depicted in the above quotes as a traditional, healthful and essential source of protein in NL, would be eaten at school and its local environs.

The following key informant laughed out loud when I questioned them about the potential of eating healthy local fish at school.

> Fresh, local seafood? In season is the biggest thing. And policy, government policy, because you can't just go cod jig whenever you want . . . everything is processed and shipped out, which is crazy. (32, Health/Educational professional, p. 5)

This quote reveals how fisheries policies are perceived to have restricted access to fish in the province and thus prevented potential connections between a healthy food environment (with healthy, culturally relevant, protein) and the foods eaten at school.

7.3.4.2 The teaching and learning environment

It was more common for key informants to discuss the relevance of school gardens in the teaching and learning environment than to explore the potential of harvesting/eating food from the water. There were a number of examples provided of schools becoming increasingly interested in and engaged by the idea of gardening. In the examples provided of school gardens, teachers and community organizations were connecting with diverse resources to support the gardening initiatives:

> Western Health offered schools a school grant opportunity in the spring . . . we weren't sure how much interest there would be, but we had a number of applicants, so we were

able to fund 11 schools to do school gardens . . . so there was a lot of interest. (17,

Health/Educational professional, p. 8)

The loss of skills noted above was a key motivating factor for many of the innovators to support food gardens. One key informant was critical that curriculum and programs that did exist were not creating a practical connection with the fishery.

Well, the Agriculture in the Classroom and Little Green Thumbs have done amazing

work to affect and change and incorporate that component of agriculture into the

curriculum of grade school. And so, the flip of that, I think, would be, in this province, to

incorporate fishing and the fishery into either curriculum or schools, because we're not

likely to be a province with large ranches that we can produce our protein that way, we're

more likely to get our protein from the sea. And so, it seems that if you're going to have

programs supporting planting crops, that you're then going to have programs supporting

well, this is how we get our protein. As I said it would probably be fishing. So that's been

a little bit of a challenge. (11, Innovative program, p. 2)

Two key informants discussed *Going Off and Growing Strong*: a youth program in Labrador that aimed to revitalize traditional Indigenous relationships to the land and food-gathering traditions:

That one is more in tune with [incorporating local foods], but it's not specifically about

food. So, they go off into the country, the land, learn things like that about how to

properly slaughter caribou, not caribou here, moose I guess, polar bears, and how to fish

and stuff like that. That's more focused on healing intergenerational trauma than it is

actual food. It's more, a by-product I guess you could say. (31, Health/Education

professional, p. 9)

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It is significant to note that the process of traditional food hunting and preparation is key to the healing of intergenerational trauma. This connection between healing and Indigenous food systems is an important one and needs to be further explored.

7.3.4.3 The social and physical environment.

While the predominant view of the food environment was one full of unhealthy food, it was also relatively common for some stakeholders to discuss the importance of local food and the local food environment, in healthy food choices, "I view wild food as a cornerstone of a healthy and sustainable food system here" (6, Innovative program, p.18).

A number of stakeholders shared their insights into broad societal transitions and shortcomings in the dominant food system. Many people reflected on how changes in society had led to changes in food practices. These reflections were sometimes on a broad level:

> We live in a society where everybody is busy, both parents are working, kids are in so much organized sports, we're not preparing meals, we're eating on the run, eating processed foods, and not making healthy choices. (4, Community organization/Food provider, p. 13)

Also people reflected more specifically on changes to the NL food system:

> There's been a whole shift in our society since 1992 when so many people, parents were still working at home in a fishery, and your children could go home during lunch. (11, Innovative program, p. 4)

Some saw long-term shifts in food systems as creating a gap in local knowledge that had long-term health consequences:

> We're not really getting this really particular information that's being lost. How do you farm in Newfoundland? Well, that took them 300 years to figure out. That's gone out the

door. So have our food preparation skills. My grandmother could take a seal and strip it down and create all kinds of cool stuff . . . Me, I wouldn't have a clue what to do with the flipper first nor last, and I'm someone who cares about it . . . because of all the cultural changes, because we're all working, if we're not learning how to do this outside the school, if it's not happening at home . . . normally I would say this should be done at home, but I don't think it can anymore because I'm watching people . . . I'm watching what they're buying and once I had a child I was really watching. And this is where I realized I have to stop eating stuff in packages because it's all crap . . . I think if you did a census or followed most kids home today, I don't think most of them have parents that can cook a meal . . . The problem, being in Newfoundland, is that we have so little that's affordable and fresh that we're really limited. It's really a struggle. (21, Community organization/Food provider, p. 2)

7.3.4.4 Community Partnerships

The vision that some stakeholders had of the learning potential of school-based experiential learning about food contrasts with an issue described in the second theme of people being unable to grasp the long-term consequences of healthy eating. A lack of understanding about long-term consequences of unhealthy/healthy eating can be compared to a lack of understanding among individuals about how they relate to their local food system. Some, like the informant below, a member of a community group who taught school children about fish ecology, tried to bridge this gap:

And the idea is, where do your fish come from? And they start here [near the beach], you know, that sort of thing; and we can actually show them that because there are the fish

right there in a bucket. The students actually can handle the fish. They can see them

flipping around. It's very hands on. (1, Community organization/Food provider, p. 5)

Another key informant who provided innovative education in the area of ecology of human food

systems expressed that their program had much resonance with their student audiences:

I'm really pleased with the number of young people getting interested in growing food

and where their food is coming from. That's very exciting. Actually doing something;

actually growing stuff. So, I think it's going to come from the bottom-up slowly, but it

needs to be mixed up with moving as well, kids are not moving, they are really out of

touch, if they're not getting outdoors, they're not getting the chance to see things

growing. (24, Community organization/Food provider, p. 15)

7.4 Discussion

In this discussion, to answer the research questions (what food system programs and

policies exist, what are the current knowledge, attitudes and needs of food system stakeholders

and how do current programs and policies function in the NL context?), I apply the principles of

systems thinking to the discussion of the results.

7.4.1 What programs and policies exist: Looking for collaboration.

There are two contrasting insights gained from the interviews about the way collaboration

happens in the NL school food system. On the one hand, school board consolidation, it appears

to me, has reduced effective cross-system collaboration in the area of school food. While school

board consolidation was part of a larger trend across Canada (Galway et al., 2013), it has not

been previously looked at in connection to the school food system. Future collaboration in the

Canadian school food system needs to be responsive to broader trends in the organization of

education.

On the other hand there are examples of innovative collaborations between particularly engaged teachers and supportive provincial and national organizations which led to the integration of food education into the curriculum. This linking of local-level actions to outside support structures such as LGT and Food First NL enhanced local engagement in education delivery. This enhanced local engagement in education connects to Greenwood's concept of place-based education that seeks a shift in accountability where schools are accountable not only through top-down standards of performance but also outward to the places in which they exist (Gruenewald, 2003).

Ultimately, effective collaboration within the school food system in NL depended on the values and resources of stakeholders in the school food system. Leadership and support are required at a national and provincial level to ensure the equitable investment in innovative programs thereby eliminating the possibility that only schools with a higher level of resources are able to provide better programs and also to ensure that the schools and students who most need the programs are able to connect to emerging best practices.

7.4.2 What knowledge and attitudes do food system stakeholders have? Evidence of iterative learning?

The way in which innovators were motivated by perceived gaps in the system of school food is an example of the type of transformative learning needed within the NL school food system. In other words, knowledge of the gaps among innovators was usefully drawn upon to fuel the type of broad organizational changes required to improve school food systems and the school environment (Sumner & Wever, 2016; Young, 2015). For example, some interviewees described how the current food programming that occurs in schools, mostly unrelated to curriculum and school development goals, could better emphasize the social value of eating or

food production (or fishing) and nurture acceptance and inclusion (Oostindjer et al., 2017).

Creation of responsive programs that build connections between food, curriculum and social

development is a counteraction to the observation from some stakeholders that we are currently

"teaching them simple things."

I learned in the interviews how innovative teaching of food systems relies on ecological

principles. The goals of the innovators were to maximize connections between school food and

learning, health and the environment. Some of the gaps in the school food system that helped

direct the innovative programs included a lack of connection between local food and foods

served at school; a lack of food-skill development; and the need to teach about the connection

between food and ecology. As described in the interviews, innovative programs tended to draw

upon reflections on ecology that will be required at all levels of the school food system. An

example of this conceptual shift to ecologically minded system thinking comes from the

discussion of one interviewee who spoke about the importance of learning from dead plants in

the classroom garden. If we find that a planted intervention designed to enhance the school food

environment has died on the vine (the school food policy for example), do we quickly remove

the evidence of the dead intervention and replace it with a new intervention (a new school food

policy?) or do we spend time reflecting on how the old one died and consider these factors

before planting the next intervention?

Systems-friendly organizations must support "creative dissatisfaction" (Young, 2015).

The opposite of this appears to exist in the current fragmented school food system described by

some interviewees. In a fragmented view of school food, the principal is seen to be solely

responsible for school food policy yet not having the resources, vision or time to do this job.

Teachers, other critical potential school food implementers, were described as having more stress

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and lacking training in health education. The Premier's Task Force on Improving Educational Outcomes further described how key structures in the province for professional development—the Faculty of Education at MUN, the DEECD, the Newfoundland and Labrador Teachers' Association and the NLESD—have been unsuccessful at previous attempts at collaboration. There needs to be more discussion of how such factors as the influence of the external food environment, the critique of the health curriculum, and unsuccessful attempts at collaborative professional development, connect to the NL school food system.

7.4.3 How do programs interact with place: Is there ongoing transformative innovation?

The interviews helped me to understand the importance of people's perspective and assumptions for the development of place-based responses to the school food system. From one perspective, the allergy policy demonstrates a place based system transformation that can be contrasted with the lack of transformation that occurred as a result of the implementation of province-wide school food guidelines. Perspectives and values drive the differing effectiveness between the allergy policy and the broader CSH policy. The allergy policy restricts some foods where risks are viewed as immediate. This policy effectively removed fish from schools despite recognition that it is a healthy and culturally relevant protein. The lack of clarity around how varied and fragmented risks connect to an unhealthy school food environment requires a broader perspective. Currently the assumption guiding understanding about transforming the school food system has focused on a lack of understanding among principals as is documented in the Auditor General's report. However, a broader perspective of school food could help to enhance accountability throughout the multiple actors in the NL school food system. The school food problem is distributed through a variety of actors and it is important to engage in local identification and discussion of the system of factors that influence school food. The CSH policy,

put in place to respond to the unhealthfulness of the school setting and to theoretically contribute to health equity and systems transformation, could thrive if people were encouraged to question some common assumptions. For example, schools could ask themselves these intriguing questions "If our breakfast program offers students mainly processed foods, is it effectively connecting to our local food system and challenges we see at the school level?" Or, "If our school cannot access foods that meet the guidelines for healthy foods as prescribed by the school food guidelines, are there other ways we can engage with local food systems to improve this situation?" Exploring these types of questions through the curriculum could connect to best practices in health promotion and local engagement and hence, can offer alternatives to the more conventional way in which health curriculum is taught in schools today (Karavoltsou, 2015).

7.4.4 Limitations to the key informant interviews.

As the research progressed, I learned that some of my initial assumptions about different organizations in the school food system were inaccurate. In some cases, organizations I did not know were providing food were doing so. In other cases, I learned that organizations that were providing food were also engaged in food literacy and serving local food. Interviewing the key informants was a learning process that allowed me to discover and become open to the multiple roles held by different organizations. When looking for examples of innovative programs and people who incorporated sustainability, food growing, and the local environment into their school food programs, I overlooked some of the more traditional agencies of the school food system, such as breakfast programs. These I had categorized as "food provision" only. The process of reflecting on how my own assumptions led to a particular definition of innovation in the school food system led me to consider the observation stated earlier that unhelpful

assumptions about school food from different points in the system may impede systematic support of school food.

In retrospect, I think the findings offered in this chapter would have had more impact if I could have attributed the knowledge shared by individuals to those individuals and/or organizations. For easier reporting and enhanced collaboration with key informants, I wish I had received ethical approval and consent from key informants to use individuals' names and organizations. That way, the process of writing could have been more collaborative and it would have been easier to tell the story of the informants. Findings from these interviews and from the reflection of the NL school food system offered through this analysis are an important part of the system of school food. In the future, it is recommended to consider this type of information gathering and collaborative insight into the system of school food, a needed innovation for system transformation.

It is possible that individuals would have not been so forthcoming if anonymity was not guaranteed, but I doubt this, as most people were genuinely interested and committed to helping to improve the school food situation. A further limitation to discuss here was the usability of the focus group data as a chance to gain insights that key informants had about the results. In retrospect I see that I held the focus group too early in my analytical process. This was partially due to my attempt to conduct the research within the time frame set out in my SSHRC proposal.

7.4.5 Contributions and future directions.

The current tendency for school food intervention and research to mainly focus on food policy and food-provisioning programs for schools may give the impression throughout society that these actions are the most important or the only available option for food in schools. This strategy connects to the current momentum to initiate a federal school food program (Hernandez

et al., 2018). The contribution of this research to that discussion is the importance of considering that a school food system cannot be meaningfully discussed without connecting to the broader issue of an over-burdened education system. The way we as a society tend to neatly separate food from teaching and from educational policy reinforces the misconception that breakfast programs and food in general are somehow distinct from the core business of the school.

More collaborative thinking and understanding is required within the system of school food in this province. Fragmentation between the event of eating at school, professional development of principals and teachers, ongoing, yet disconnected innovations in school food, and the broad restructuring of education, all need to be addressed collaboratively if we want to build more healthy sustainable school food systems.

The potential role of research in supporting future collaboration was also an important realization. Chapter Six refers to the way in which reports based on previous research about the school food system in this province have been essentially shelved. For improved system functioning, an essential part of the process is the incorporation of a strategy to learn from developing knowledge of the system. While this research was predicated on the need to transform school food systems to be something more sustainable and healthy, the reality is that the findings reveal a system that has by and large been transforming in another direction, towards fragmentation and processed cheap food. Within this reality one can find examples of a different type of sustained collaboration, that between a growing food industry and a fragmented educational system. Being able to point out the existence of these two optional directions of systems transformation was made possible by the alternative approach taken here, a promising alternative for knowledge production that is responsive to the systems we live in and helps draw

attention to how the very practice of traditional research has tended to fragment these systems

making them incomprehensible.

Chapter Eight: What is on the Menu for School Food in NL? Synthesis of Findings and

Directions for Further Research

In this chapter I provide a synthesis of results of my research. I begin by describing an image conjured up by a key informant. This person spoke to me about the challenge of distinguishing between a processed fry which "looks good on paper" and meets the SFG and a homecooked fry. The latter may have potentially not met the guidelines depending on added fat and salt, but its production was likened to an artistic more than an industrial process. In the case of the homecooked fry, maybe the potato was sourced locally, produced with love in small gardens and involved the use of traditional skills and knowledge. On the one hand, the neat way in which the processed fry meets the SFG is handy and convenient. The fry has been processed such that it can be quickly assessed according to its nutritional value to fit neatly into the guidelines as set by the provincial government. In this way, the pre-packaged, processed food product epitomizes the fragmentation of knowledge characteristic of our global food systems and our education systems (Wrigley, 2019).

What tools do we have to assess which of these menu items, the frozen fry or the homemade, locally sourced fry, is better for the student? The challenge of distinguishing between these two types of fries is comparable to the task that I set out to accomplish in this dissertation: I aimed to create a research program that was able to document the difference between a conventional approach to school food research and intervention, and an alternative systems approach to research and intervention. The objective of the alternative approach to research was to actively support and promote a healthy and sustainable school food system characterized by healthy food, positive educational outcomes and strong and sustainable food

systems. The main contribution of this dissertation is to demonstrate the central importance of viewing school food as an interconnected system.

Background research into the recent history of school food programs and policies in NL revealed how understanding and intervention regarding school food in NL has been mainly focused on the quality of food at school, which is consistent with Oostindjer's 'Phase II' description of school food (Oostindjer et al., 2017). It did not provide insight into cultural, societal, and environmental trends that could have an impact on the effectiveness of school food programs.

The defining features of school food discussed in Chapter Two (school food is political, varies according to context and requires an interdisciplinary approach to understanding) led to the justification for using an ecological praxis in my research. The example of the school garden as a transformational tool (Chapter Two) helps to explain how reframing our understanding of school food could allow for better understanding of the flaws in the current system that would allow for the creation of more sustainable alternatives. Consequently, the unfolding methodology presented in this dissertation establishes a new way of understanding the NL school food system which prioritized the integration of more socially based knowledge.

A core principle differentiating this research from previous studies was to be able to learn not just from food served but from studying and being engaged in the system: how it works and how this understanding can be applied to help build a more healthy sustainable school food system. The research questions underpinning this ecological praxis were:

- What school food programs and policies exist in the province of NL?
- What knowledge and attitudes exist about the current school food system among educators/school food system stakeholders?

- How do knowledge, attitudes and programs interact in context to either facilitate or inhibit transitions toward a more healthy and sustainable school food system?

Focusing on these research questions, I will summarize my findings. I align the research questions with the three principles of systems thinking that emerged in the research process and are discussed throughout this dissertation. For each section below, I highlight crossovers between findings from each of the multiple methods reported on in this dissertation. I close the chapter with a discussion of limitations, recommendations and future directions to support positive change to the menu of school food in NL.

8.1 What Programs and Policies Exist in the NL School Food System: Looking for Collaboration

The focus on the interconnectedness of the school food system helped to identify strategic areas for collaboration and integration. While many resources exist to support the school food system, often the arms go out separately, as one key informant said of the disconnect between the healthy eating policy and the "safe and caring schools" policy. My dissertation findings provide insights into the fragmentation of resources and supports at a provincial and school level. It helps us see how issues such as education restructuring and unhealthy food environments play a critical role in school food and that there are various supports available to and accessed by schools. Yet, strategic integration between policies and resources, and how they operate in individual schools to effectively confront ongoing barriers, does not exist.

8.1.1 Review of findings related to the potential of collaborative programs and policies within the school food system.

In the case of the school greenhouse (Chapter Five), the interviews showed that the greenhouse had a positive effect on community health by bringing people together. An even

more common or accepted way that people described the benefits of the greenhouse was that it taught children about healthy eating and associated links to ideas of chronic disease and risk-factor reduction. While theoretically both of these effects of the greenhouse are equally meaningful, and perhaps more meaningful when combined or planned for in synergistic ways, there were a number of indications that the broader collaborative, multi-system impacts of the greenhouse were not maximized to their full potential. Rather, sometimes educational restructuring had unintended negative impacts on greenhouse development. The change from a denominational to a non-denominational system, school board consolidation, and school reconfiguration all were disruptive to the greenhouse's existence. School system restructuring affected, for example, the development of a school-based course specially designed for the greenhouse by school teachers. The school changed from being a high school to an elementary school, weakening the original role of the greenhouse in secondary level training for students "at risk", and the school environment was described as having shifted from a cooperative environment to one more influenced by shifting politics, where teachers were moved to new positions. Another example of system impediment to collaboration was how imposed evaluation schemes made it hard for teachers to justify the learning that was occurring in the greenhouse.

To investigate collaboration in the school food system, I asked school principals (see Chapter Six) to describe the structures in place to support healthy eating. I found that schools tended to mention most often the KES program (a breakfast program). It was much *less* likely for a school to have a team in place to respond to healthy eating concerns in 2016 than in 2007. That is, the KES program became more popular, school-based teams became less popular, and barriers remained constant.

The survey also showed how collaborations may help to tackle some of the issues identified. For example, there were a number of places in the survey responses where principals voiced concern about the amount of unhealthy food that students ate, despite the supposed adoption of a province-wide healthy food policy. Sixty percent of all survey respondents (41/68) listed at least one fast-food destination as a place that students frequented for lunch. We learned from principals the important and possibly negative role of the external food environment (from questions about health concerns and about the food available off-school). This finding led to my recommendation that increasing attentiveness to this issue should fuel future discussions about supports needed to enable schools to respond to negative pressures from the food industry. For example, the fast-food industry and municipalities are potential and currently untapped collaborators in building an improved NL school food system.

Key informant interviews (Chapter Seven) provided more insight into barriers to collaboration among stakeholders in the school food system. Most significantly, analysis of the interviews revealed that consolidation of the province's English school boards (which represent over 90% of the schools in the province), had a negative impact on the ability to sustain support for the SFG. This was most likely due to the fact that important positions for upholding policy changed and to the general disorganization that arose from restructuring processes. Another barrier to effective policy implementation was the disconnect between the foods advocated by the school food policy and the foods available in the surrounding food environment. This disconnect was also a sign of the fragmentation impeding collaboration at a systems level in the NL school food system. Principals from some schools were under pressure to keep their food service provider because they had few other options and the alternative of having no food service, or having to operate the food service themselves, was much less feasible. This presents

an untenable position, where principals, or schools, are responsible for upholding SFG that are seriously challenged by the broader food environment, which was characterized by a lack of healthy food. This situation is further accentuated as principals are already under increasing administrative pressures to demonstrate academic achievement.

In one school that was attempting to build a farm-to-cafeteria program, a new type of partnership with the food service provider was explored. This case helped to show how in the presence of national supports and leadership (Farm to Cafeteria Canada, in this case), a school had the resources to innovate via the introduction of a salad bar. This innovation provided insight at the provincial level about the process of a school becoming proactive in the development of a contract with the food service provider. Viewed from a different perspective, this example also highlights how school food policy does not exist in a vacuum but is seriously jeopardized by the surrounding lack of integrated healthy food environment policies and supportive educational policies at municipal, provincial and national levels. The lack of national education standards for school food is another barrier to future intersectoral collaboration in Canadian school food system transformation.

At a provincial level, the many challenges faced by the NL school food system create impetus for collaboration among key stakeholders. A number of interviewed stakeholders agreed that change was needed in the NL school food system. The interviews with innovators in the school food system provided tangible examples of the emergence of programs that built on collaborative principles, such as those making connections among ecology, food systems, learning and culture, or those that built connections between food procurement and local food systems.

8.2 Knowledge Within the NL School Food System

Each of the different methods used in my research (bibliographic as well as empirical research) enhanced my understanding of the importance of critically examining knowledge in the system. While the province has collected relevant information specific to food consumed in NL schools, this information has not changed the setting to the extent that school food stakeholders feel would be required for students' health to improve. Collecting and sharing local knowledge and understanding the interconnections between food, local ecology, self and place is an example of an alternative type of school food thinking. This type of thinking can be distinguished from the lowest-price-is-best "processed fry" type of thinking. This research showed how the fragmentation of knowledge was a characteristic of the current NL school food system. This fragmentation often led to a reduced ability of people to perceive larger trends that could only come into focus if a longer time frame and a context specific focus prevail.

8.2.1 Review of findings related to the idea of knowledge within the system.

My knowledge of the greenhouse (Chapter Five) was gained by looking at its 20-years existence through an ecological lens. I found that those involved with the greenhouse had to consistently reframe its function with direct outcomes in focus. This began with the use of the greenhouse to employ youth at risk and diversify the economy beyond the fishery. Gradually the greenhouse became a way to address health outcomes of concern. The powerful connection between actions in the greenhouse and traditional food systems in NL was a by-product. The lack of understanding of how to frame and sustain systemic change may be one reason for consistent patterns of gaps in public funding for school food seen all across Canada (Martorell, 2017a).

The survey (Chapter Six) attempted to gauge the degree to which principals and schools were engaged with and participating in a systems response to school food. Interestingly, in the

previous provincial surveys (2001 and 2007) the qualitative questions provided more insight into context than the quantitative data (Coalition for School Nutrition, 2001; Government of Newfoundland and Labrador, 2007). However, answers to open-ended questions were left unanalyzed in the 2007 survey, suggesting that qualitative information about the school food environment was not considered as an important type of knowledge. In this light, it appears that much of the historical information we have about school food has been top down and not useful at a school level. While there is growing evidence that local school teams are better suited to understand and respond to the complex entanglement of school food features and to design school based responses that fit the learning needs and gaps at a school level (McCall & Laitsch, 2017); school level teams are less prevalent than they were in 2007.

A survey question about ongoing connections between school food and local producers, fisher people, community members or parents, revealed how very few (less than 30%) respondents mentioned ongoing connections. Those that did mention connections referred to their breakfast program which I had not considered previously to be an example of local food systems engagement. On further consideration, parents and community members involving themselves in the serving of breakfast at school is an excellent example of local food systems engagement. As food and food systems become more entangled, so do school food systems, and learning how to know about the school food system may lead to the development of literacy about it. This described adjustment and adaptation to different ways of knowing about school food connects back to the adaptation in knowing about food described by Martin in her research of individuals within the Inuit community of Labrador (Martin, 2011). Examples of grey areas in knowing about school food include differing ideas about what is local food, what is a local food system, what is healthy food, what is processed food, what assumptions guide food allergy bans,

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etc. We, as a society, face a challenge to develop ways to know about school food that help us expand past quantity and into quality, or to move from surface understanding to deep learning, defined as learning that occurs across multiple levels, or systems (Matsushita, 2017).

As in the case study of the school greenhouse, analysis of stakeholder interviews revealed examples within the system where school food was understood to be a tool to lead to transformation, minimizing the fragmentation of food and learning, or of food and the environment. Some community organizations approached school food in this ecological sense, drawing out diverse interactions among food, people, learning and the environment. An example from my research is how gardening at school enhanced students' connections to each other, to the community, and to their own learning.

Thus the main finding about knowledge and attitudes in the NL school food system is the powerful way assumptions can influence actions, and how different visions of school food connect to the factors and tools used to intervene in the school food situation. Food systems thinking both at a school level and at a provincial level can provide an innovative tool for developing future visions of school food. The survey provided evidence that when there were local teams in place, they can create effective transformation. The existing structure of school-based teams that are a part of the school development process can be used strategically to connect and respond to broader trends. While the focus of the Auditor General's report implies that the school district owns the school food problem, this is not a realistic or comprehensive strategy. The lack of school based teams in place to respond to and support the school food system is a finding that connects school food conversations to a broader conversation about local school district governance in Canada. Galway et al. found that, "school board roles and responsibilities have changed and continue to be shaped and marginalized by new

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accountabilities and new arrangements with provincial governments…a policy environment that is antagonistic to local governance" (Galway et al., 2013, p. 28).

The finding of how assumptions surrounding school food can limit the tools used to intervene also highlights a limitation in this research. In retrospect, a more collaborative approach to designing the study and surveying the school food system could perhaps have led to a richer understanding of school food systems throughout the province. The assumption behind my survey of principals was that the principal was an essential informant (based on previous surveys), but a more collaborative school-based survey, like the SFEAT could have perhaps have supported the vision of the democratized principal better (Kendrick, 2018), thus counteracting a policy environment antagonistic to local governance.

Both at a school and at a provincial level, we need new ways to observe and respond to the multitude of factors that interact in the school food system to lessen potential risks or combine to make them more intense. The picture below (Figure 8.1) depicts a sample school in this province in order to demonstrate some of the concurrent trends found in this research that relate to the quality of the school food system. Evidence supporting these statements is summarized in Table 8.1.

Changes in external systems:
- Educational restructuring
- Food systems changing

School food system trends:

- Challenges with implementation of provincial school food policy
- Continuation of food related health concerns
- Prevalence of fast food options, processed foods
- Increase in breakfast programs, and Kids Eat Smart recognized as source of healthy food at school
- Increased likelihood school food services outsourced
- Curriculum relatively unchanged
- Continuation of barriers and variability between schools
- Increase in allergy policies
- Decrease in fish consumption, maintenance of chicken nuggets
- Decrease in school based committees to respond to healthy food
- Promising uptake of food cultivating in schools
- Emergence of innovations in school food system which respond to local challenges

Figure 8. 1

Trends in the NL school food system

Table 8. 1

Evidence supporting statement of trends in NL school food

Challenges with implementation of provincial school food policy	As noted in Chapter Seven, key informants described how a new policy had been drafted for the newly consolidated district but was slow to be adopted.
Continuation of food related health concerns	In 1986, the Canada Health Attitudes and Behaviour Survey found that "Newfoundland's children have the least healthy eating habits of all Canadian children" (Hanrahan & Ewtushik, 2001, p. 83). Fast forward thirty-two years: "Students in Newfoundland and Labrador reported consuming nutritious foods and beverages least frequently (7.3 times per day, 95% CI 6.6-8.0), while students in British Columbia reported consuming nutritious foods and beverages most frequently" (10.2 times per day, 95% CI 9.4-11.0) (Acton et al., 2018, p. 940).
Prevalence of fast food options, processed foods:	As noted in Chapter Six, sixty percent of all survey (2016) respondents (41/68) listed at least one fast food destination as a place that students frequent for lunch. At another point in the survey when principals were asked to comment on the health concerns they felt students faced, one of the most common responses was the amount of processed food that students eat. This was also commonly mentioned in the stakeholder interviews.
Increase in breakfast programs and Kids Eat Smart recognized as source of healthy food:	Fifty-two percent of schools had no breakfast program in 2007, down from 70% of schools surveyed in 2001 (Coalition for School Nutrition, 2001; Government of Newfoundland and Labrador, 2007). The main resource accessed by schools encompassed by the principal survey was KES. According to the KES website, they operate in more than 90% of schools in the province (Kids Eat Smart Foundation Newfoundland and Labrador, 2021). In the 2016 survey, principals described KES as a source of healthy food for students.
Increased likelihood school food services outsourced:	In 2001, cafeteria food service was operated by the school in 37% of schools. In 2007, 23% of schools operated the cafeteria service (Table A.3, Appendix A). According to the Auditor General's report in 2019, "Of the 118 schools that offered lunch service [in the Avalon and Central regions], 105 used the services of an external school food provider" (Office of the Auditor General Newfoundland and Labrador, 2019, p. 31).
Curriculum relatively unchanged	Principal survey results indicated that teaching and learning about food is largely restricted to health class and the latter is often not taught due to pressure from other courses. This suggests that there is more room for food studies in this and other parts of the curriculum, a reality that has remained constant for the last two decades (Coalition for School Nutrition, 2001; Government of Newfoundland and Labrador, 2007). Interviews also revealed a need to adapt the curriculum, a view reflected in the following quote: You know, the curriculum that we have to follow in schools, that's designed by the department and through the district and brought down to teachers. We need it. However, we have to get far more creative in how we present it to students, okay?" (20, Innovative program, p.5)

Table 8.1 continued

Continuation of barriers and variability between schools:	In 2001, 55% (138/251) of principals said that "food choices" was the most important food and nutrition related issue that students face in school. In 2007, 66% (183/276) selected "cost of healthy food choices available" as the biggest barrier to healthy eating at school (Table A.8, Appendix A). In 2016, the most common barriers selected were "limited student demand" and "cost of healthy food." Regarding variability the amount of time students are given to eat and the varying options available to students in the environment surrounding schools are two examples.
Increase in food allergy policies:	In 2001, 35% of respondents (89/251) reported having an allergy policy. In 2007, 48% (132/276) reported having an allergy policy (Table A.4, Appendix A). In 2016, only 12% (8/65) of respondents said they had no food banned at their school
Decrease in fish consumption, maintenance of chicken nuggets:	When findings from 2016 are compared with findings from 2001 and 2007, it is revealed how some items have remained as common school food items, including ice cream, chicken nuggets and fries. Chicken nuggets are a symbol of processed food on the school food menu and were recently targeted by the Minister of the DCSSD, who stated that the goal of the soon to be introduced new school food guidelines, "… is to move away from processed foods. [We're] saying 'see ya later' to the chicken nuggets and fries and working more with fruits and vegetables in the diet in the schools" (Power, 2019). Evidence of the lack of fish being served at schools includes the finding in the principal survey in 2016 that a majority of schools had banned fish. This was observed in the interviews as well, You know a lot of schools have fish allergies. So is it fish or shellfish? Okay what about this fish, which is codfish a lot of times, or halibut or whatever… If it's any one of those, you can't have it in all of the schools. You tend to not see fish on any of the menus. I used to love fishsticks when I was growing up. You can make a really good fishstick today from scratch, and nobody would even know the difference. But today you have no fish in schools, none, very rarely. (18, Community organization/Food provider, p.23)
Decrease in school-based committees to promote healthy food:	We learned that in 2016 the majority of schools surveyed did not have a committee in place to support the school's food environment. This was a noticeable change from 2007 when most schools surveyed did have such a committee (Table A.7, Appendix A). In 2016, those that reported having committees in place were able to achieve a number of health promoting actions.
Promising uptake of food cultivating in schools:	In Chapter Six, 52% of principals reported on existing food cultivating programs at their school.
Emergence of innovations in school food system which respond to local challenges:	For example, in Chapters Five and Seven, classroom gardens providing alternative learning spaces, promoting inquiry-based learning. Also in Chapter Seven, key informants raising awareness of lack of provincial school food programs connecting fish to schools.

Looking at school food as a system enables consideration, reflection and understanding of potential interconnections between these trends and also shows how risk may accumulate when they all combine in the school setting. Prior to this investigation there has been no discussion or analysis of this broad set of factors that must be considered in analysis and transformation of the NL school food system.

8.3 Innovation in the NL School Food System

Returning once more to the distinction between the processed fry and the home cooked fry: let's ask which fry has taken longer to cook? The shortened cooking time of the processed fry (maybe deemed an innovation) connects to the outsourcing of all food system components that brought that potato into the nicely packaged, labelled and quick to make product which meets the SFG. Defining and accounting for innovative connections that could be made in an ideal setting where students help to grow the potato, learn from a community partnership or from the local environment how to incorporate that potato into a meal which can be shared by everyone is not a simple process. Also these actions open up new pathways for food safety risk and all kinds of uncertainty that are outsourced in the case of the processed, industrial food. The willingness to embrace new risk and uncertainty is entirely dependent on the values defining the system. The ability of this research to narrate some of the tensions in the school food system was made possible through emphasizing values such as sustainability and community which have been extraneous to traditional purely financial reductions of school food and limited ways of thinking about risk.

8.3.1 Review of findings related to the idea of innovation within the system.

Taking a systems view of the case of the St. Francis greenhouse helped draw together an understanding of how the greenhouse was a setting that inspired individuals to link gaps in the current food system to strengths from place-based food traditions which were perceived to be dying. The biggest barriers preventing the greenhouse from being a site for innovative systems transformations were an inflexible structure and a lack of long-term vision around systemic outcomes and possibilities.

In terms of innovative visions and transformation, the survey allowed for new understanding about ongoing activities such as gardening, fishing, and berry picking, all of which are occurring, as documented in Chapter Six. On the other hand, other trends visible through this survey in connection to previous surveys are a steady reporting of health concerns that connect to diet, a steady reporting of barriers, and little innovation about food included in the curriculum. Since the survey was conducted, new research has emerged which found that current high school curriculum in NL lacks depth in areas of food sustainability and culture (Hefferman, 2019, p. iii). The limitations of the survey point to the need for future innovation in how schools can incorporate food system knowledge gathering to fuel enhanced integration of school level food policy, curriculum, food programs and community connections.

Interestingly, the interviews revealed how innovators in the NL school food system exhibit an ecological understanding of the school food system that can be considered a transferable innovation not only at a school level but for future system wide planning and considerations of how to improve the school food system. This may be the tool currently lacking that can lead to strategic use of resources that can react to system fragmentation.

8.4 Future Ways of Knowing about School Food

A focus on innovations in this research led to a discovery of some of the weaknesses in the school food system and how innovative responses were built to respond to those weaknesses. An example is the way in which innovative teaching of the connection between food growing and social-emotional learning can help fuel identified gaps or weaknesses in health education. An understanding of the connection between system weaknesses and innovations points to a limitation of this dissertation. This limitation was made visible to me by a member of my supervisory committee. I discovered after having collected my data that I had not considered the food cultures of Indigenous peoples, nor their independent governance structures in this research. This limitation signals to me a weakness in my concept of school food: that it is deeply embedded within education and research systems that are colonial in nature. Greenwood (2014) states that,

> …if the root metaphors of modernism - individualism, anthropocentrism, faith in progress - help us to understand the ideological origins of pre-ecological thinking, the cultural construct of 'colonialization' can help us to understand how those assumptions have been expressed in geopolitical practices that impact people and places everywhere. (p.285)

Greenwood further explains that by colonialization he refers to both the process of dominating people's homelands and territory, and people's bodies and minds for the production of privilege maintained by power and also assimilative cultural patterns which he describes as schooling or consumerism that overdetermine or restrict possibilities for people and the places where they live.

Interestingly, this tendency to insufficiently understand the food system connects to recent research that provides an insight into food system colonization in this province's history. Hanrahan's unique perspective on the impact of the nutritional interventions sponsored by the International Grenfell Association (IGA) led to the conclusion that these interventions had limited local benefits (Hanrahan, 2016). One example is how the IGA staff paid little attention to the local geophysical environment and thus tended to minimize their potential for good. For example, despite the effectiveness of the Inuit practice of using birds' liver as a remedy for night blindness, this was not an innovation broadly adopted by the IGA as a best practice in the NL context. It was much more likely to advocate for solutions that worked in other parts of the North American continent. Hanrahan's example of the influence of colonization on knowledge use and dissemination provides insight about the importance of acknowledging the limitations of this research (Hanrahan, 2016).

While discovering a lack of connection between the NL school food system and the fisheries for instance, I learned that some of the most innovative school food systems practices that were relevant to the unique food system and place of this province were emerging from Indigenous communities in British Columbia and Alaska, practices such as using the land in school programming and incorporating fish into school meals (Farm to Cafeteria Canada, 2014; Izumi et al., 2015). Also, the Indigenous land-based program in Labrador described by two key informants, while designed to address intergenerational trauma, also crosses over with lessons for the school food system about how to connect food to social-emotional health. The links between emerging ecological, complex forms of knowledge and Indigenous knowledge systems are strong and it has been suggested that an education inspired by Indigenous cultures and

epistemologies helps to question the assumptions on which unsustainable contemporary ideas about education, economics and culture are based (Greenwood, 2014).

8.5 Future Directions and Recommendations

Many of the current assumptions around school food that limit transformation of the school food system seem to connect to a history of colonization and a mindset that has tended to see food as an object and not as a source of connection to people and place. Changing the current system requires challenging those assumptions throughout the system of school food. This research has provided insight into examples of innovation in the NL school food system, where such connections have emphasized how school food can be used as a tool to respond to gaps in school food (to connect to the surrounding food system, to connect to learning, to connect people, to develop self). This connective type of thinking can be contrasted with traditional knowledge production about school food in this province which, although thorough and explanatory, has failed to lead to meaningful change.

Three identified areas for future collaboration and knowledge production in the NL school food system are identified. The first area begins with the recognition of the importance of addressing gaps in our understanding of Indigenous knowledge and the connection between these gaps and colonization. As place-based approaches to the food system and integrative ecological approaches become a promising new solution to the fragmentation and ills of contemporary NL society's food system, this will be a hopeful course for building solutions for the future and one that is essential to school food programming for both Indigenous and non- Indigenous students. Moving forward, we need to know how researchers can best learn from and connect with the unique Indigenous school food systems in this province and across the country. How can that knowledge be integrated into our understanding of school food systems in an equitable way?

Second, future research needs to address barriers to the consumption and integration of fish in schools. How the absence of fish in NL schools connects to multiple components of the school food system is intriguing in its complexity. One key informant observed -an observation backed up by the survey data- that it was much more common for people to connect gardens and agriculture to teaching and learning about food systems than to look to the ocean (which surrounds the island of Newfoundland and extends to the northernmost communities in Labrador) as a source of inspiration for future programs and policies in school food systems. An important benchmark of critical food literacy is for people to develop a sense of connection and care of place (Wever, 2015). This connection was expressed in the vision of an innovator in school food systems speaking about the importance for young people in this province to have an opportunity to connect with the fishery (equivalent to a program like LGT),

> …it's important that everyone knows where their food comes from, how to prepare fresh, local food, because then they're more likely to eat fresh, local food. And also the concern about our environment and health of our environment, well if you know where your food comes from then you are more likely to link healthy environment to healthy food, be more interested in conserving a healthy environment, or sustaining that. All of those things I think are linked together (11, Innovative program, p3).

A question for future exploration is whether and how a fishery that has been directed towards export (in contrast to a fish-as-food fishery as described by Levkoe et al.) has contributed to a lack of awareness of the ways in which school food system collaboration can be fueled by introspection about the province's fishery (Levkoe et al., 2017).

Third, as I complete this dissertation, the impact of COVID-19 on school food is a newly emerging topic. I observe in my own children's school that the lunch service has been cancelled

and innovative approaches such as the Farm to Cafeteria local food salad bar have been advised to halt at this time (Government of Canada, 2021). These new barriers occur at the same time that it has been observed how changes brought on from the COVID-19 pandemic will increase food insecurity (Food Secure Canada, 2020). At the same time, the emergence of the COVID-19 virus itself has been linked to problems with our food system (Wallace, 2016).

COVID-19 has highlighted another complex question that intricately connects to school food. The provincial lockdown and closing of schools have highlighted the dependence of families on school food programs as a source of daily nutrients and the role of such programs in taking the burden off families (Walsh, 2021). This situation underscores the presence of food insecurity in this province, the potential toll that health inequalities play on the education system and the role for education in being transformational. We know from the literature that context matters in creating school food programs that are responsive to the social systems within which they are embedded (Gilbert et al., 2018; Robert & Weaver-Hightower, 2011). This seems more important within societies that are characterized by such high rates of food insecurity. We need tools as a society to shed light on the factors that create the situation and tools to change it. The promise of a school food system network to create systems change has been explored in connection with the TEGS project (Mansfield, 2016). Tools developed in connection with the TEGS project, such as the SFEAT, the design of professional learning opportunities, and school-university partnerships in curriculum development are promising strategies to be used as a starting point for building responsive collaborations. Findings from this research which can help to fuel innovation include: the need to take a critical look at the view that breakfast programs are the only or a sufficient school food solution, and the need to take a critical look at the health curriculum that is viewed as a low priority within the school and has failed to engage school

communities in discussion of the way in which literacy of the school food system can be transformative. Building connections between current infrastructure, such as the KES program, the school development process and the current school food policy has been highlighted as a promising entry point.

These three areas for future inquiry and collaboration connect to multiple components of the school food system and depend on collaborative solutions. It is recommended that a promising step forward will be the strengthening of network connections throughout the systems within which school food is nested, be they school level, municipal, provincial, national or international.

It is also recommended to:

- Develop a provincial network of school food system actors and organizations to enhance collaboration within and knowledge sharing throughout the province;

- Develop school food system networks at both a regional and school level to enhance collaboration and knowledge sharing within the school food system at a regional and school level;

- Enhance school food system literacy throughout these networks by learning from ongoing innovation in the NL school food system

A limitation of this research discussed in Chapter Seven was the way in which research collaboration and engagement might have been strengthened by being able to quote individuals throughout the research rather than anonymous numbers. I am personally motivated at this juncture to reconnect with individuals who helped contribute to this research and investigate strategies and methodologies for enhanced knowledge co-production. I believe this will lead to better and more useful research.

Future research could also address:

- the varying quality of eating environments in schools across the province;

- the degree to which differential supports are able to address differential needs amongst schools and regions.

- the way in which schools positively connect eating with positive social connections and other activities such as growing, processing and composting food.

- how to facilitate the integration at the school level of a system of supports to lead to more healthy and sustainable school food systems.

- how ongoing advances in Canadian food policy, specifically those directed towards enhancing collaboration between sectors, can inform and connect with innovative approaches to Canadian school food policy (Government of Canada Department of Agriculture and Agri-food, 2021).

It is hoped that the NL school food system as conceptualized in this dissertation can inform a multitude of future research and actions to lead to this province's unique version of the school food revolution.

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Appendix A.   Summary of 2001 and 2007 Surveys Conducted in NL

I have organized the findings from the 2001 and 2007 assessments (Coalition for School Nutrition, 2001; Government of Newfoundland and Labrador, 2007) in the tables below according to McKenna's five policy options for supporting healthy eating at school (McKenna, 2010). These five policy options are (1) food and drinks available, (2) the food environment, (3) health education, (4) health services, and (5) family/community outreach.

Food and drinks available.

Breakfast and Lunch programs. The 2001 survey defined a school feeding program as any program that offered a nutritious, balanced meal to school children regardless of their ability to pay.

Table A.1

Breakfast and lunch programs (2001 and 2007)

	2001	2007
Percentage of schools surveyed with no breakfast program	70%	52%
Percentage of schools surveyed with no lunch program	84%	86%

Foods served. In 2001 and 2007, three questions about foods sold at schools were asked: (1) What foods are sold in the cafeteria? (2) What foods are sold in the canteen? and (3) What foods are sold in vending machines? Table A.2 below provides a listing of the top ten foods sold in the three different venues at school with each item categorized as nutritious, somewhat nutritious and non-nutritious according to the 2001 categorization system. The 2001 system is used here as it permits easy categorization of foods as opposed to the SFG which in many cases require more nutritional information.

Table A.2

Food currently served in school (2001 and 2007)

2001			2007		
Top 10 from Cafeteria	**Top 10 from Canteen**	**Top 10 from Vending**	**Top 10 from Cafeteria**	**Top 10 from Canteen**	**Top 10 from Vending**
White milk	White milk	Soft drinks	White milk	White milk	Bottled water
Chocolate milk	Chocolate milk	Sport drinks (Gatorade)	Chocolate milk	Chocolate milk	100% fruit juice
100% fruit juice	Ice cream products	Bottled water	Bottled water	100% fruit juice	Potato chips
Hamburgers	100% fruit juices	100% fruit juices	Sandwiches	Bottled water	Fruit drink
Pizza	Potato chips	Fruit drinks	Pizza	Cheese and crackers	Cereal bars
Hot dogs	Cheese and crackers	Potato chips	100% fruit juice	Yogurt	Granola bars
Sandwiches	Soft drinks	Chocolate bars	Salads	Granola bars	Soft drinks
Ice cream	Bottled water	Candy	Soup	Ice cream products	Chocolate bars
Chicken nuggets	Fruit drinks	Granola bars	Hamburgers	Fruit	Sport drinks (e.g. Gatorade)
French fries	Cookies/cakes	Cookies/cakes	Macaroni & Cheese	Potato chips	Candy

Foods are shown in color codes with green being nutritious, yellow being "somewhat nutritious" red being "non-nutritious" and blue indicating that "food was not listed in the categorization system." From a glance at the colour codes in Table A.2, it appears that more nutritious food was being made available in schools in 2007 compared to 2001. Of the non-nutritious offerings available in 2001 and 2007, there are some items which remained as common school food items. These include ice cream, chicken nuggets and fries. The difference between the 2001 categorization of nutritious food and the way in which the SFG categorize food healthfulness demonstrates how items are not easily categorized. The item "sports drinks" in 2001 was "somewhat nutritious" and in the SFG was "not recommended." Granola bars were considered "nutritious" in 2001 but according to the SFG categorizations, this depended on

whether they were dipped in chocolate or not. French fries were considered "non-nutritious" in 2001 but the SFG require more information about the fries, such as the fat and salt content and the cooking process. Ice cream was "non-nutritious" in 2001, but according to the SFG, some ice cream is included in the "serve moderately" category.

Food Service. Table A.3 presents a comparison between 2001 and 2007 of the percentage of food services operated by the school, and indicates that schools tended to switch from school-led to outsourced food services. This was echoed by Canadian trends (IBIS World, 2020).

Table A.3

Percentage of food services operated by school (2001 and 2007)

2001	2007
Cafeteria = 37% Canteen = 83% Vending machine = 41%	Cafeteria = 23% Canteen = 72% Vending machine = 27%

Allergies. Table A.4 below shows there was an increase in the number of schools reporting that they had an allergy policy.

Table A.4

Percentage of schools with an allergy policy (2001 and 2007)

2001	2007
Thirty-five percent of respondents (89/251) reported having an allergy policy.	Forty-eight percent (132/276) reported having an allergy policy.

The food environment.

Results in Table A.5 indicate that between 2001 and 2007 there was a decrease in the number of schools reporting that their schools were within walking distance to a food establishment. Regarding the time given to eat, it would appear that students in 2001 had less time on average for lunch than students in 2007.

Table A.5

Description of food environment (2001 and 2007)

	2001	2007
Food establishment outside school	Seventy-one percent of schools reported being within walking distance to food establishments.	Fifty-six percent of schools reported being within walking distance to food establishment.
Time to eat	Forty-two percent of schools had between 20-29 minutes for lunch.	Thirty-eight percent of schools reported having 40-49 minutes for lunch.

A major challenge to interpreting trends in to the question about the food environment surrounding the school and really any question about the school food environment is the wide range of variability among individual schools. Factors that cause variation are location of school (rural or urban), age of students in schools (a wide range of possibilities including K-12 or any number of different combinations of grades (for example a school could hold grades 4-7, grades 7-12, grades K-9, etc.), and whether students are staying at school or going home for lunch. Indeed one of the key findings from the 2001 survey was that, "The diversity of schools means that there is no one solution for all" (Coalition for School Nutrition, 2001, p. 5).

Health education.

Table A.6, summarizes information collected about health education in the 2001 and 2007 surveys. The different way each survey framed questions about health education limit the ability to make comparisons.

Table A.6

Health education (2001 and 2007)

	2001	2007
Nutrition in the curriculum	In 2001, sixty-three percent of principals felt there is adequate coverage of food and nutrition information within the existing curriculum.	When asked what courses covered nutrition components, most were offered through health. Forty-two percent wanted to see more food and nutrition information in the curriculum at all grade levels.
Access to home economist	Fourteen percent of schools reported having access to a home economist.	Twelve percent of schools have a teacher with undergraduate or graduate training in home economics.

Health services.

There was a change in the organization of health regions between the 2001 and 2007 surveys. In 2004, the provincial government began the process of integrating fourteen institution and community services boards into four health authorities (Tomblin & Braun-Jackson, 2005). Also, in 2001 there were 10 English school districts and one French. That number was later reduced to four English and one French, and now there are three: one English, one French and one Innu. Table A.7 shows the health services available at schools as discovered in the 2001 and 2007 surveys. Again, the questions about health services were asked slightly differently making comparisons difficult. In 2001, 72% of principals said that the school nurse is available at their school, but a majority reported that they did not have readily available advice from a nutritionist or home economist. In 2007, only 22% of schools had a nurse involved on their team, while the majority of schools (67%) had a health promotion committee in place.

Table A.7

Health services (2001 and 2007)

Health services	2001	2007
Health personnel	Seventy-two percent listed the school nurse as a service available at their school. Four percent of schools said they had access to a nutritionist.	When asked "Who is involved with the school's Living Healthy Team or committee?" Twenty-two percent of respondents had a nurse involved on their team.
Have a committee in place to support the food environment in schools	N/A	Sixty-six percent of schools did have a health promoting committee in place.

Family/community outreach.

There is some crossover between this category and the information provided in the surveys about the financial and organizational support of the breakfast and lunch programs. Figures A.1 and A.2 below show the way in which breakfast and lunch programs were supported by a combination of volunteer, parent and community groups in conjunction with school support.
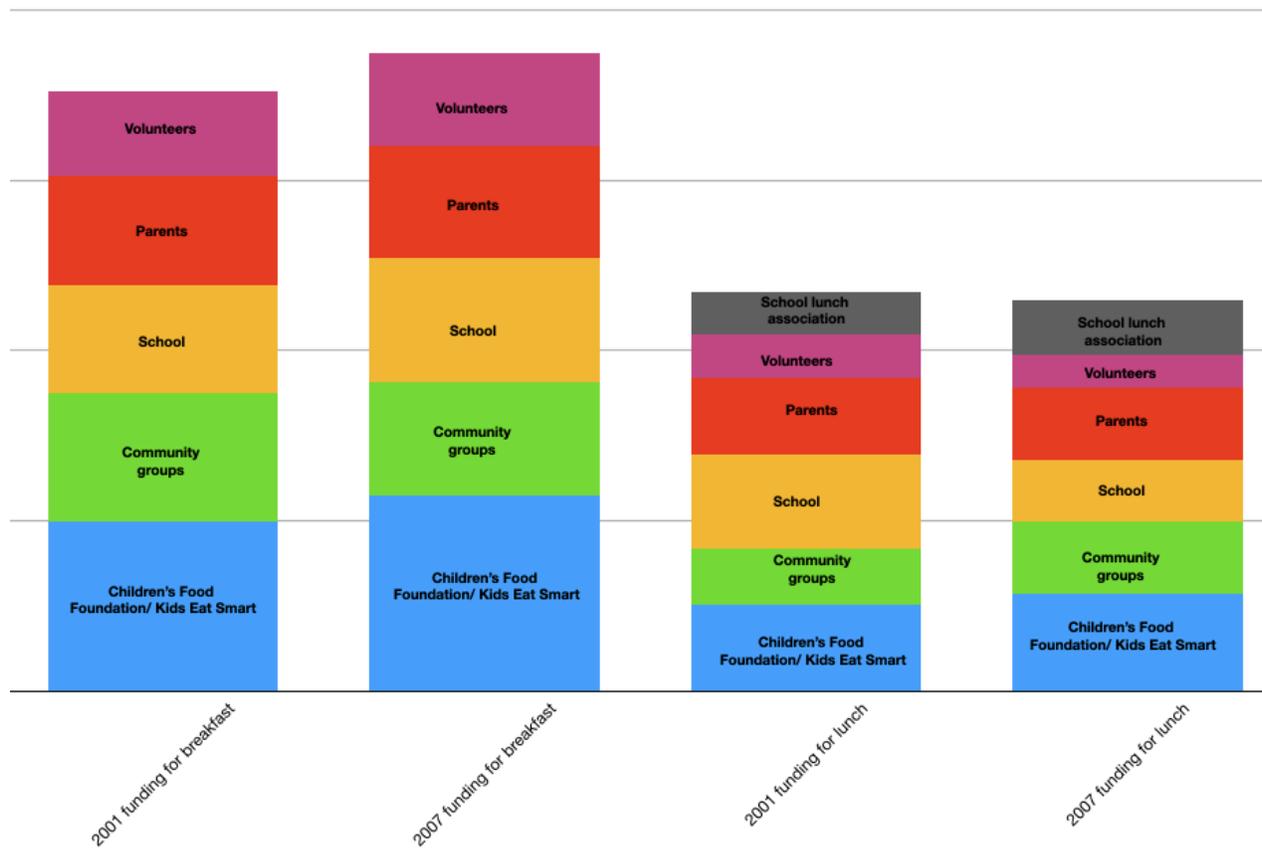
Figure A.1

Relative percentage of funding for school breakfast and lunch programs
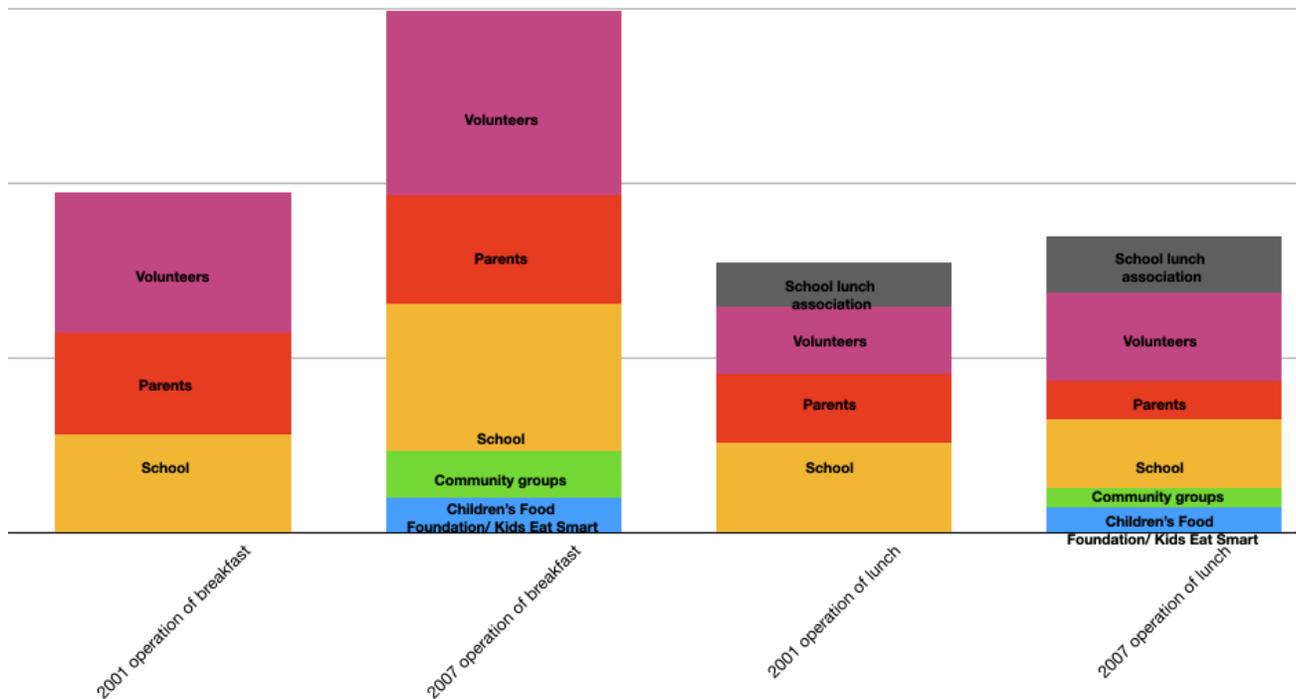
Figure A.2

Relative percentage of support for operation of breakfast and lunch

Additionally the 2007 needs assessment found that, "There is a good level of support from the community for healthy living initiatives from the majority of schools" (Government of Newfoundland and Labrador, 2007, p. iv)

Other information.

In each of the surveys, principals were asked to report on barriers to healthy eating at their schools. There were consistent reports that cost, and poor availability and accessibility to healthy food are key barriers as shown in Table A.8.

Table A.8

Barriers to healthy eating (2001 and 2007)

2001	2007
Fifty-five percent of principals said that "food choices" was the most important food and nutrition related issue that students face in school.	Sixty-six percent selected "cost of healthy food choices available" as the biggest barrier to healthy eating by school respondents.

In 2001, principals were asked, "What would be needed to enhance the delivery of nutritious food choices and food services in your school?" No verbatim answers were provided in the copy of the 2001 survey results made available to me. However, in the 2001 "Key Findings" section, common themes were described as follows:

> Principals were asked to indicate what would be needed to enhance the delivery of nutritious food choices and services in their schools. Their needs included funding for breakfast and lunch programs; reduced prices for nutritious food choices similar to the School Milk Program (junk food is now cheaper than most nutritious food items); an education program for parents and students on nutrition; a program to encourage parental involvement in healthy food choices; better food storage and handling facilities; a promotional campaign for healthy eating; and availability of nutritious, affordable food in isolated communities (Coalition for School Nutrition, 2001).

Findings from the 2007 needs assessment were congruent with the response to the comparable question in the 2001 survey. The 2007 needs assessment asked, "What is the best way we can support you to make your school a healthier place?". I thematically analyzed the verbatim comments, providing a summary of most frequently mentioned themes. A list of the top 10 are depicted in Figure A.3 below.

What is the best way we can support you to make your school a healthier place? (n=148)

Theme	Number of times theme mentioned
Unknown/ No response	61
In-service teachers; increase time to sustain initiatives	52
Funding, resources	49
Support/ subsidize healthier food choices	44
Equipment/ space for eating	25
Education parents/ wider community	20
Equipment/ space for activity	19
Equipment (not specified)	13

□ Number of times theme mentioned

Figure A.3

Responses about support schools need to be healthier (2007)

The most common suggestion (after "I don't know" or "no response") concerned human resources and time in the school including providing professional development for teachers, increasing teacher time to devote to physical education and health initiatives, and contributing human resources for schools, such as the support of a dietitian. An example of a verbatim comment reflecting this theme is "The living healthy committee should be initiated by public health, teachers on these teams may be possible but they are overburdened with other commitments." The next frequently mentioned theme was a need for funding and resources. This was followed by the theme of a need for supports to subsidize healthy food choices at school. An example of this was, "provide funding incentives to allow us to provide much healthier choices to students at lower prices. If healthier choices are more expensive, we will sell less. Government must support initiative if serious about it." Responding to an open-ended question, principals spoke of the need for subsidized healthy food, but when asked if there is a need for a lunch or breakfast program, responses suggested the need was low. This apparent contradiction may be

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the result of a lack of understanding about what is intended by the term "lunch program." In both 2001 and 2007, respondents reported a greater need for breakfast programs, perhaps because more schools had breakfast programs in place compared to lunch programs, and recognized their value. Many respondents noted that schools need better equipment and space for cooking, eating and physical activity. Examples of responses on this theme: "ensure all schools have sinks to wash hands; make sure there are adequate cleaning staff; provide more equipment for physical education and also play time; provide adequate eating facilities; and subsidize breakfast and lunch programs so all kids can eat."

Another important theme discernible from the comments about supports needed by schools was the need to invest in educating parents and the wider community. Sample responses included: "continue to make healthy living a province-wide initiative; the more external support the more that the issue is in the forefront; the better it is for schools who are making this a part of their environment." Respondents also mentioned a need to sustain the support that they were currently receiving, for example: "continue with the emphasis and education of the past year; within 5-10 years, healthy schools will be the norm. We need to facilitate that development." Less common comments, though important, suggested a need to involve students, enforce policies, and provide supports for keeping schools clean.

Regional highlights.

The 2001 and 2007 surveys provided results at both the provincial and the regional level, and there are some regional characteristics that stand out. These regional differences are displayed in the table below.

Table A.9

Regional difference in school food practices (2001)

Region	Program/supports/characteristics
Eastern	More likely to have a nurse available than other regions
St. John's region	More likely to have a home economist than other regions
Grenfell/Labrador	More likely to have access to a nutritionist than other regions

Table A.10

Regional differences in school food practices (2007)

Region	Program/supports/characteristics
All regions	Cost of healthy food the most common barrier
All regions except Eastern	Cafeteria and vending machines are operated by the school
Eastern	Schools more likely to have a cafeteria compared to other districts Schools more likely to have a team dedicated to health promotion More liability challenges in making schools available to non-school groups
Central	Higher percentage of students had the option to pre-order food, usually pizza, from an outside caterer
Western	Schools operate their own lunch programs
Labrador	Higher percentage of schools with a longer lunch time Highest number of schools requiring students to go home to lunch Less support from families compared to other districts Higher percentage reporting availability of food and food choices as barriers

Appendix B.   St. Francis Case Study Interview Outline

Teacher Interview Outline
Personal:
1. How long have you been active in this program?
2. Can you describe what you do? Tell me more?
3. What motivates you to do this?
4. What is your favorite thing about gardening? Your least favorite thing?
5. What have you learned in the garden?
6. How is produce from the garden incorporated into everyday meals?
7. What kind of influence does gardening have on your feelings about food, if any?
8. What kind of influence does gardening have on your level of activity, if any?

Perceptions about student participation:
9. What do the students do in this program?
10. How do you motivate students to participate?
11. What do students like best about the garden? What do they like least?
12. What do you think students learn in the garden? How does learning in the greenhouse differ from classroom learning?
13. How does the garden influence students' feelings about food?
14. How does the garden influence students' levels of activity?

Connections with school, community and environment:
15. How does the gardening program impact school life?
16. Is the garden integrated into courses?
17. What kinds of connections are made between the school and the community with the greenhouse program?
18. What do you think motivates community members to participate in the greenhouse program?
19. What kinds of connections are made between the school garden and the surrounding environment?

Facilitators and Deterrents:
20. What deterrents are there to gardening at school?
21. What factors would help to sustain this program?
22. How could this gardening program be made even better?

Community Member Interview Outline

Personal:
23. How long have you been active in this program?
24. Can you describe what you do? Tell me more?
25. What motivates you to do this?
26. What is your favorite thing about gardening? Your least favorite thing?
27. What have you learned in the garden?
28. How is produce from the garden incorporated into everyday meals?
29. What kind of influence does gardening have on your feelings about food, if any?
30. What kind of influence does gardening have on your level of activity, if any?

Perceptions about student participation:
31. What do the students do in this program?
32. How do you motivate students to participate?
33. What do students like best about the garden? What do they like least?
34. What do you think students learn in the garden? How does learning in the greenhouse differ from classroom learning?
35. How does the garden influence students' feelings about food?
36. How does the garden influence students' levels of activity?

Connections with school, community and environment:
37. How does the gardening program impact school life?
38. Is the garden integrated into courses?
39. What kinds of connections are made between the school and the community with the greenhouse program?
40. What do you think motivates community members to participate in the greenhouse program?
41. What kinds of connections are made between the school garden and the surrounding environment?

Facilitators and Deterrents:
42. What deterrents are there to gardening at school?
43. What factors would help to sustain this program?
44. How could this gardening program be made even better?

Government Official Interview Outline

General Knowledge about School Gardening:

45. Are you aware of any initiatives that support school gardening in NL?
46. What potential links are there between school gardening and current government policy?

Facilitators and Deterrents:

47. What deterrents are there to gardening at school?
48. What factors would help to sustain school garden programs?
49. How could school gardening programs be made even better?

Appendix C. Map of NL school food system actors and organizations

Below is a map (Figure C.1) of actors and organizations in the school food system. No connections between organizations are shown within this figure, as different connections are possible depending on the school in question.

Figure C. 1

Newfoundland and Labrador school food system

In tables C.1-C.3 I have provided a brief description of each organization and their role.

Table C.1

NL school food system federal organizations

Public Health Agency of Canada	The Public Health Agency of Canada is in place to deliver on the Government of Canada's commitment to help protect the health and safety of all Canadians. It focuses on preventing chronic diseases, preventing injuries and responding to public health emergencies and infectious disease outbreaks (Government of Canada, 2020)
Joint Consortium for School Health (JCSH)	Created in 2005, this consortium is the mechanism within Canada to implement Comprehensive School Health. The JCSH is in place to facilitate coordination of the efforts of the health sector, a shared federal and provincial/territorial responsibility, and the education sector, which operates autonomously within each of Canada's provinces and territories (Bachop, 2010)
Farm to Cafeteria Canada	This pan-Canadian organization works with many partners to educate, build capacity, to bring local, healthy, and sustainable foods into all public institutions (Farm to Cafeteria Canada, 2015). This organization led the Nourishing School Communities initiative along with multiple national partners including: Heart & Stroke, YMCA Canada, Federation of Sovereign Indigenous Nations, The Lunch Lady Group Inc., University of New Brunswick and the Propel Centre for Population Health Impact. With three years of funding from the federal government through the Canadian Partnership Against Cancer's Coalitions Linking Action & Science for Prevention (CLASP) program, Nourishing School Communities provided $2.4 million to various programs across the country, including Food First NL. In the final report of the Nourishing School Communities project, it was found that procurement practices of the St. John's School Lunch Association were positively influenced by a series of learning labs led by Food First. Also it was found that the salad bar program helped students to meet national guidelines for eating fruits and vegetables (Farm to Cafeteria Canada, 2016)
Food Secure Canada	Key stakeholder in the Coalition of School Food and producer of knowledge informing food policy landscape in Canada (Martorell, 2017a).
The Coalition for Healthy School Food (Coalition for Healthy School Food, 2021b)	The Coalition for Healthy School Food is a group of organizations from across Canada advocating for a national school food program.

Table C.2

NL school food system provincial organizations

The Department of Education and Early Childhood Development (DEECD)	This department is responsible for the K-12 school system. In 2017-18, this system included 261 public schools, six private schools and three First Nations schools (two of which fell under the Innu School Board) with two school boards (English and Francophone) and 65,401 students (Government of Newfoundland and Labrador Department of Education and Early Childhood Development, 2019).
The Newfoundland and Labrador English School District (NLESD)	The district is governed by 17 elected school board trustees. The NLESD includes just over 65,000 students, 256 schools and over 8000 employees (Newfoundland and Labrador English School District, 2019a).
Le conseil scolaire francophone provincial de Terre-Neuve-et-Labrador (CSFP)	The French school board includes six schools (Conseil scolaire francophone provincial, 2019).
Mamu Tshishkutamashutau Innu Education	The Innu School Board includes two schools, Mushuau Innu Natuashish School in Sango Bay and Sheshatshiu Innu School located on the shores of Lake Melville.
The Department of Health and Community Services (DHCS)	This department provides overall direction and financial support to health promotion programming and initiatives throughout the province (Newfoundland and Labrador Centre for Health Information (2014).
Department of Children, Seniors and Social Development (DCSSD)	The "Healthy Living" Division is housed in this restructured department formed in 2016 (Newfoundland and Labrador Centre for Health Information (2014).
Regional Health Authorities (RHAs)	There are four RHAs: Eastern, Central, Western and Labrador/Grenfell. Each RHA is structured differently, is composed of different positions, and has a different reporting structure (Newfoundland and Labrador Centre for Health Information (2014).
School Health Promotion Liaison Consultant (SHPLC)	There were five SHPLCs in 2020, one per each RHA and two in the Eastern Health region. The role of the SHPLC is to improve the health and learning of students by supporting school health policies and initiatives at the provincial, district and school levels (Eastern Health, 2017; Labrador-Grenfell Health, 2021). School Health Promotion Liaison Consultants work in collaboration with both RHA and school district personnel. SHPLCs are funded by the DHCS to reinforce the partnership between health and education at the regional/district level (Newfoundland and Labrador Centre for Health Information (2014).
Regional Nutritionist	Each RHA has at least two regional nutritionists (Newfoundland and Labrador Centre for Health Information (2014).
Public Health Nurse (PHN)	The role of the nurse is different for each of the RHAs (Newfoundland and Labrador Centre for Health Information (2014).

Table C.3

NL School food system community organizations/food providers

Kids Eat Smart (KES) Foundation of Newfoundland and Labrador	KES is a registered charity operating in 90% of the province's schools (Kids Eat Smart Foundation Newfoundland and Labrador, 2021). The organization provides guidance, funding and other resources, depending on local financial circumstances and availability of volunteers, to support breakfast, lunch or snack programs in schools. Nationally, KES has been held up as a best practice because the program is almost universal (Food Secure Canada, 2015).
The School Milk Foundation of Newfoundland and Labrador	An organization that promotes milk consumption. It relies on funding and in-kind contributions from the Dairy Farmers of Newfoundland and Labrador, Scotsburn Dairies, Central Dairies Limited and the Provincial Department of Fisheries and Land Resources. The School Milk Foundation (SMF) operates in more than 90% of schools (School Milk Foundation of Newfoundland and Labrador, 2021).
The School Lunch Association	A registered charity that provides a hot, nutritious lunch for school children. The program serves over 5800 meals each day in 34 schools in the St. John's area (School Lunch Association, 2021).
School Food Providers	There are a variety of commercial school food providers operating within the province but it is difficult to know who they are and in what schools they operate because each school negotiates its own contract and there is no record at the provincial level of this information.
NL Federation of School Councils	The NL Federation of School Councils (NLFSC) is the provincial umbrella group for parents, teachers, high school students (where applicable), and community supporters who are committed to enhancing the quality of school programs and improving the levels of student achievement in our schools (Newfoundland and Labrador Federation of School Councils, 2021).
Little Green Thumbs (LGT)	The LGT program supports agriculture in the classroom by providing teachers with a grow light, grow boxes, soil, and seeds, and the program also connects classes with a farmer mentor and provides other resources. At the time of this research there were about 130 classrooms in the province connected to LGT (Agriculture in the Classroom, 2021).
Food First NL	Food First NL are the provincial lead for Farm to Cafeteria Canada. They have worked with four schools to establish salad bar programs (Food First NL, 2019). They led a Learning Lab project to support local food procurement in schools (Food First NL, 2019). In 2016, Food First NL in collaboration with Kids Eat Smart, organized the first ever Provincial School Food Gathering. Food First also works to support rural, remote, northern and Indigenous communities to support programs, that increase access to healthy and culturally appropriate food (Food First NL, 2018).
Local Food to School (LFtS)	LFtS initiatives include a number of stakeholders. I connected with LFtS actors by participating in the Learning Lab. This is where I discovered the Fishing for Success (FFS) program, which addresses the need to teach children how to catch fish, learn boating skills, and process and cook whole fish, which they then eat.
Memorial University Botanical Garden	Memorial University's Botanical Garden offers school programs for K-12 and educator workshops, and has published resource manuals on botany in the curriculum, biodiversity in the school yard and composting in the curriculum (MUN Botanical Garden, 2021).
Ocean Learning Partnership (OLP)	The Coastal Explorers Field School is the flagship program of the OLP which aims to integrate ocean science and career education into the K-12 school system in Newfoundland and Labrador (Coastal Explorers, 2019).
Brother Brennan Environmental Centre	The centre operates an outdoor school dedicated to helping students learn about the environment (Environmental Education Commission, 2019).

Appendix D. Copy of Google Form Survey and Survey Invitation

Link to Google Form:
https://docs.google.com/forms/d/e/1FAIpQLSc5B1PC5c6CkmDIEbs5FgB4NhC3DhoWVZYJl7Vy3bZlW_7V4A/viewform?usp=sf_link

School Food Environment Survey
Hello,

I'm inviting you to participate in research about the Newfoundland and Labrador (NL) school food environment.

We are asking schools across the province to share their experience of school food so that we can understand what currently exists in order to help build on local successes and experiences.

If you are unable to complete the survey and you can think of another person at your school who is knowledgeable of your school's food environment, please forward this survey along to them to complete. The survey has 20 questions and it should take between 10 and 15 minutes to complete.

We will not be gathering any personal information or the name of your school. The information that we gather will be combined with information from all of the other schools in the province. Analysis of the survey will be shared with the province's school boards, health authorities and other key stakeholders.

Your completion of this survey will be understood as your consent to take part in this research. This research has been approved by the Health Research Ethics Authority, the Newfoundland and Labrador English School District and the Conseil Scolaire Francophone. It is being conducted by Emily Doyle (emilyd@mun.ca; 325-0907), PhD candidate in the Community Health and Humanities Division of the Faculty of Medicine at MUN, under the supervision of Dr. Martha Traverso-Yepez (; 864-6086). If you have any questions or would like to know more about this project, please contact Emily Doyle or Martha Traverso-Yepez.

Thank you for your time and kind consideration to this request. We will be accepting surveys until November 30th, 2016. A downloadable PDF version of the survey is available here (https://sites.google.com/a/mun.ca/emily-doyle-research/school-food-environment-survey). It can be emailed (emilyd@mun.ca) or sent to Emily Doyle, Room 2850, Health Sciences Centre, Division of Community Health and Humanities, Faculty of Medicine, 300 Prince Philip Drive, St. John's, NL A1B 3V6.

Emily Doyle, B.A.; B.Ed; M.Phil; PhD (candidate)

1. **What role do you have at the school?**

Principal
Teacher
Guidance Counselor
Parent
Student Council Representative
Other:

2. **Check which grades you have at your school.**

Tick all that apply.
K
1
2
3
4
5
6
7
8
9
10
11
12

3. **In which region is your school located?**

Mark only one oval.
Avalon East- Metro
Avalon East
Avalon West
Burin
Vista
Central
Western
Labrador

4. **What do you consider to be the biggest health concern facing your students?**

5. What barriers (if any) has your school experienced in supporting healthy food consumption at school?

Mark only one oval.

No barriers were experienced

Cost of healthy food

Availability or accessibility of healthy food

Existing contracts limit consumption of healthy food

Limited student demand for healthy food

It is not a priority for our school at this time

Not sure

Other:

6. **Do you believe student learning is impacted by the quality of the food students consume at school?**

7. **Do you believe student health is impacted by the quality of the food students consume at school?**

8. **What do you think are the 5 top selling food or beverages at your school (including cafeteria, canteen or vending machine purchases)?**

9. **On an average day how much time do students have to eat lunch?**

10. **Describe some of the most popular lunch destinations outside of your school which students frequent.**

11. **What foods are currently banned from school premises due to food allergies?**

12. **Which of the following supports has your school accessed to enhance the school food environment?**

Tick all that apply.

Indoor gardening program (e.g. Little Green Thumbs, earth boxes, container gardening)

Outdoor gardening program (e.g. raised vegetable beds, greenhouse, community garden)

Farm visits (or visiting farmer)

Berry picking, foraging, etc.

Teaching of traditional food practices (building a root cellar, making a fish net, etc.)

Fishing (visiting the fish plant, ocean, etc.)

Other:

13. **Do you know of any food links being taught in the curriculum at your school? If so, please describe.**

14. **Please select the following food related cultivating programs and/or initiatives offered to students at your school. Select all that apply.**

15. **To your knowledge have any of your school's food services or programs made connections with local producers, fisher people, community members or parents? If so, please describe.**

16. **Does your school have a committee that oversees policies and practices concerning healthy eating at your school?**

Mark only one oval.
Yes
No

17. **If yes, what main actions has this committee focused on in the past 2 years? Have you noticed a change in learning or health outcomes based on the actions of this committee? Please elaborate.**

18. **How accessible is healthy food (fresh fruits and vegetables/minimally processed food) at your school?**

Mark only one oval.
Very accessible
Accessible
Somewhat accessible
A little accessible
Not at all accessible

19. **How accessible is healthy food (fresh fruits and vegetables/minimally processed food) in the community surrounding your school?**

Mark only one oval.
Very accessible
Accessible
Somewhat accessible
A little accessible
Not at all accessible

20. **If you have any observations, questions or comments about school food that haven't been addressed above, can you describe them below?**

You are finished! Thank you.
If you are interested in further discussing this or learning more about this research project, please send an e-mail to emilyd@mun.ca or give me a call at ████████. Your time is very much appreciated:) In late fall 2016, the results of this survey will be shared with the province's school boards and other stakeholders.

Appendix E. Results from 2016 Survey of School Principals

Table E.1

Table form 2016 survey results

Q1. What role do you have at the school?	
N	89
Principal	68
Assistant Principal	3
Teacher	17
Guidance counsellor	1

Q2. What grades do you have at your school?	
N	68
All grades (K-12)	28
Primary/Elementary (K-6)	21
Junior High/High School (7-12)	19

Q3. In which region is your school located?	
N	68
Avalon (Avalon East-Metro, Avalon West)	27
Central (Central+ Vista)	9
Western	21
Labrador	11

Q4. What do you consider to be the biggest health concerns facing your students?	
Number of responses: 1 response (n=44); 2 response (n=16); 3 response (n=3); 4 response (n=1)	
N	64
Inactivity	28
Diet	26
Accessibility/Affordability	11
Chronic conditions	9
No response	4
Mental health	4
Parents	4
Screen time	2

Q5. What barriers (if any) has your school experienced in supporting healthy food consumption at school?	
Number of responses: 1 response (n=66); 2 responses (n=2)	
N	68
Limited student demand for healthy food	22
Cost of healthy food	22
Availability or accessibility of healthy food	17
Other (O)	4
Not sure	1
No barriers were experienced	2
Existing contracts limit consumption of healthy food	1
It is not a priority for our school at this time	1
O1: Local franchises with other options. O2: Parents, We need a culture change. O3: The storage of fruits and vegetables on an ongoing basis would be a challenge for us. O4: Availability, cost, lack of demand. Students will choose to eat if items are free. We do not stock fresh items in canteen because of cost and ultimately they spoil.	

Q6. Do you believe student learning is impacted by the quality of food students consume at school?	
N	67
Yes	54
Maybe	5
Not sure	3
No	5

Q7. Do you believe student health is impacted by the quality of food students consume at school?	
N	66
Yes	46
Maybe	10
Not sure	2
No	7

Q8. What do you think are the 5 top selling food or beverages at your school (including cafeteria, canteen or vending machine purchases)?	
Number of responses: 1 response (n=15); 2 responses (n=6); 3 responses (n=8); 4 responses (n=6); 5 responses (n=32)	
N	67
Milk	41
Water	29
Juice	25
Pizza	16
Wraps/pita	14
Baked chips	10
Chocolate milk	8
Ice cream	8
Chicken nuggets	7
Granola/cereal bars	7
Pasta/lasagna	6
Yogurt	6
Fries	6
Burgers	5
Cheese and crackers	5
No food offered	4
Snack foods	4
Cheese Strings	4
KES	3
School Lunch Association	3
Baked goods	2
Hotdogs	2
Muffins	2
Cafeteria Service	2
Gatorade	2
Chips	2
Cookies	2
One mention of each of the following: Garlic fingers, Popcorn, Chicken, Coffee, Nachos, Pancakes, Unsure, Soup	

Q9. On an average day how much time do students have to eat lunch?	
N	66
20	18
25	8
30	7
35	0
40	3
45	11
50	10
55	4
60	5
Other (O)	1
O=We are a half day program, students leave at lunch time to go home	

Q10. Describe some of the most popular lunch destinations outside of your school which students frequent?	
Number of responses: 1 response (n=42); 2 response (n=10); 3 response (n=8); 4 response (n=5)	
N	65
Home	19
Macdonald's/ A & W/Burger King	14
Sub store	13
Tim Horton's	11
Local take out/chip truck	11
N/A	8
Mary Brown's/KFC	8
Convenience store	6
Pizza place	5
Grocery store	5
Fast food	4
Unsure	2
Café (healthy)	1
Bakery	1

Q11. What foods are currently banned from school premises due to food allergies?	
Number of responses: 1 response (n=18); 2 response (n=20); 3 response (n=13); 4 response (n=6); 5 response (n=5); 6 responses (n=1); 7 responses (n=2); 14 (n=1)	
N	65
Nuts (Peanuts, Peanut butter, Nuts, Other Nuts)	75
Fish (Fish, Shellfish, Seafood)	49
Eggs	18
Kiwi	8
Wowbutter	2
None	8
Other (O)	16
Unsure	1
Sesame seeds	2
O= Blueberries, strawberry, coconut (2), cherries, apples, peas (2), flowers, latex, starfruit, Axe, white cranberry juice, all melons, bananas (2)	

Q12. Which of the following supports has your school accessed to enhance the school food environment?	
N	68
Kids Eat Smart	60
School Public Health Nurse	43
School Health Promotion Liaison Consultant	38
Regional Wellness Coalition	18
Agriculture in the Classroom-NL (operates the Little Green Thumbs program)	15
Regional Nutritionist	13
Local Community Garden	6
MUN Botanical Garden	4
Other	4
Food First NL (Formerly the Food Security Network),	4
Joint Consortium for School Health	1

Q13. Do you know of any food links being taught in the curriculum at your school? If so, please describe.	
Number of responses= 1 response (n=35); 2 response (n=9); 3 responses (n=5); 4 responses (n=1); 6 responses (n=1)	
N	51
No response (NR)	17
No links (N)	3
Unsure/Don't know (U)	18
Health curriculum (H)	14
Healthy Living (HL)	6
Nutrition (Nu)	8
Home Economics (HE)	3
Physical Education (PE)	1
Social Studies (SS)	3
Science (S)	3
Geography (G)	1
Religion (R)	1
NL Studies (1)	1
Heritage fair (1)	1
French (1)	1
School Development plan (SD)	1
Community service (CS)	1
Functional curriculum (FC)	1
Community garden (CG)	1
Grade 4 (G4)	1
Cooking	1
Days for healthy eating (1)	1
Adolescence (1)	1
Canada's Food Guide (1)	1
Provincial Curriculum (PC)	1
Other (O)	1
O= This is a loaded question. Curriculum is being taught according to the outcomes set by the DoE. I am not intimately familiar with all Specific Curriculum Outcomes if it is part of the course, it's being taught.	

Q14. Please select the following food- related cultivating programs and/or initiatives offered to students at your school?	
N	42
Indoor gardening program	22
Farm visits	21
Outdoor gardening program	17
Teaching of traditional food practices	8
Berry picking, foraging	5
Fishing	4
Other	5
None	1
Other= O1: Full-time nutrition program; O2: Children will plant seeds but do not grow fruit; O3: Cooking program with local chef; O4: visits to grocery store	

Q15. To your knowledge have any of your school's food services or programs made connections with local producers, fisher people, community members or parents?	
N	66
Yes	14
Unsure	15
No	31
N/A	6

Q16. Does your school have a committee that oversees policies and practices concerning healthy eating at your school?	
N	68
Yes	19
No	49

Q17. If so, what main actions has this committee focused on in the past 2 years? Have you noticed a change in learning or health outcomes based on the actions of this committee?	
NR	48
Provided response listing activities (listed 4 activities= 1; 3 activities = 2; 2 activities = 7; 1 activity = 10)	20
Promoting healthy eating/adjusting food and beverage offerings	15
Actions supporting/supported by KES	5
Increasing activity	5
Safe and caring schools committee or other committee has taken leadership on health promotion in the school	2
Increasing water consumption	2
Building a community garden	1
Communication with parents	2
Implementing the policy	1
Noticed change?	3
C1=Attitudes towards healthy food starting to change. C2=Result has been less unhealthy choices. C3=Water consumption has tripled.	

Q18. How accessible is healthy food (fresh fruits and vegetables/minimally processed food) at your school?	
N	68
Very accessible	17
Accessible	19
Somewhat accessible	18
A little accessible	10
Not at all accessible	2

Q19. How accessible is healthy food (fresh fruits and vegetables/minimally processed food) in the community surrounding your school?	
N	68
Very accessible	12
Accessible	20
Somewhat accessible	21
A little accessible	13
Not at all accessible	2

Q 20. If you have any observations, questions or comments about school food that haven't been addressed above, can you describe them below?	
NR	58
Comments provided (2 comments=3; 1 comment=7)	10
Need for resources (volunteers/kitchen facilities/access to healthy food)	4
Concern about food sent from home and lack of control	3
Economic barriers to good food	2
Pride of efforts and success with school programs to provide healthy food to children	1
Importance of improving food served in schools	1
Concern students not eating country food/local food	1
Students choose less healthy options	1

Appendix F. School Demographics and Survey Demographics

Table F.1

Number of schools surveyed compared to number of schools in the province

	Number of schools	Per cent of schools out of total number of schools
Newfoundland and Labrador English School District (Newfoundland and Labrador English School District, 2019b)	255	94%
Le Conseil scolaire francophone provincial de Terre-Neuve-et-Labrador (Conseil scholaire francophone provincial, 2019).	6	2%
MTIE - Mamu Tshishkutamashutau (Let's All Learn Together) Innu Education (Mama Tshishkutamashutau Innu Education Inc., 2021)	2	1%
Native Schools (Government of Newfoundland and Labrador Department of Education and Early Childhood Development, 2019)	1	<1%
Private Schools (Government of Newfoundland and Labrador Department of Education and Early Childhood Development, 2019)	6	2%
Total Schools in Newfoundland and Labrador	270	
Sample Population	68	25%

Table F.2

Grade distribution of schools surveyed compared to schools in the province

		All grades (K-12)*	Primary/Elementary (K-6)	Junior High/High School (7-12)
All Schools in Province	Newfoundland and Labrador English School District (Newfoundland and Labrador English School District, 2019b).	121	78	56
	Le Conseil scolaire francophone provincial de Terre-Neuve-et-Labrador (Conseil scolaire francophone provincial, 2019)	5		1
	MTIE - Mamu Tshishkutamashutau (Let's All Learn Together) Innu Education (Mama Tshishkutamashutau Innu Education Inc., 2021)	2		
	Native Schools (Government of Newfoundland and Labrador Department of Education and Early Childhood Development, 2019)	1		
	Private Schools (Government of Newfoundland and Labrador Department of Education and Early Childhood Development, 2019)	5		1
	Total Schools in Newfoundland and Labrador	134	78	58
	Percent of Schools in NL by Grade	50%	29%	21%
	Sample Population	28	21	19
	Percent of Schools in Sample by Grade	41%	31%	28%
	*Schools with populations that are not solely within the ranges of K-6 or 7-12 are categorized as K-12.			

Table F.3

Geographical distribution of schools surveyed compared to schools in the province

		Avalon	Central	Western	Labrador
All Schools in Province	Newfoundland and Labrador English School District (Newfoundland and Labrador English School District, 2019b).	92	78	63	22
	Le Conseil scolaire francophone provincial de Terre-Neuve-et-Labrador (Conseil scolaire francophone provincial, 2019)	**2**		**2**	**2**
	MTIE - Mamu Tshishkutamashutau (Let's All Learn Together) Innu Education (Mama Tshishkutamashutau Innu Education Inc., 2021)				2
	Native Schools (Government of Newfoundland and Labrador Department of Education and Early Childhood Development, 2019)		1		
	Private Schools (Government of Newfoundland and Labrador Department of Education and Early Childhood Development, 2019)	4		1	1
	Total Schools in Newfoundland and Labrador	98	79	66	27
	Percent of Schools in NL by Geography	36%	29%	24%	10%
	Sample Population	27	9	21	11
	Percent of Schools in Sample by Geography	40%	13%	31%	16%

Appendix G. Interview Questions on the NL School Food Environment

1. In your opinion, what are the most common concerns when it comes to the health of children in NL?
2. From the list presented in the box below, which do you consider more relevant aspects of the school food environment?

Potential components of the School Food Environment:

- o The food and beverage options available at school

- o The policies which influence what food is served at school.

- o The curriculum relating to food culture, nutrition, food production

- o The hidden curriculum: social perceptions of what is healthy and not healthy

- o The physical place in which food is consumed

- o Food options in the neighbourhood surrounding the school

- o The influence of industry groups, community groups or parents in providing food or teaching about food.

- o The interaction between health (mental, physical, community) and food

---

3. Reflecting on the environment as defined in the list provided, how has the school food environment changed since you were in school? How do you think the school food environment will change in the coming years?
4. How does the school food environment relate to the health of children in NL?
5. How does the school food environment relate to the ability of children to learn in school?
6. What position do you have or what activities are you involved with in the NL school food environment?
7. Who do you believe are some of the key stakeholders in defining the state of the school food environment?
8. The Comprehensive School Health model has been adopted by the NL Healthy Students Healthy Schools initiative. In the context of NL schools, which factors do you think facilitate a healthy school food environment? b. Which factors create barriers?

Policy

9. What is your awareness of policies focused on improving the school food environment? (These could be at any of the following levels: Classroom? School? Municipal? Provincial? Federal?)

Community Partnerships

10. Who are relevant community partners when it comes to improving the school food environment?
11. Do you believe they have a positive or a negative impact?

Social and Physical Environment

12. How does the physical environment of the school influence the school food environment?
13. How do you think the social environment of the school influences the school food environment?
14. Do you think there is anything about the NL school food environment that distinguishes it from other places in the country, in the world?

Teaching and Learning

15. How could lessons about the school food environment be incorporated into the curriculum?
16. What kind of role do you think teachers have to play in the school food environment?

Concluding Thoughts

17. Do you have any closing thoughts or is there anything else you think I should be asking about?

Appendix H. Ethics Approval Documentation

Health Research Ethics Authority

Ethics Office
Suite 200, Eastern Trust Building
95 Bonaventure Avenue
St. John's, NL
A1B 2X5

April 24, 2013

Ms. Emily Doyle
C/O Dr. Martha Traverso-Yepez
Division of Community Health and Humanities
Room 2830
Health Sciences Centre

Dear Ms. Doyle:

<u>Reference # 13.093</u>

RE: **School Gardens: Benefits and Sustainability**

This will acknowledge receipt of your correspondence.

This correspondence has been reviewed by the Chair under the direction of the Board. *Full board approval* of this research study is granted for <u>one year</u> effective **April 18, 2013.**

This is to confirm that the Health Research Ethics Board reviewed and approved or acknowledged the following documents (as indicated):

- Budget, acknowledged
- Revised Consent Form-teachers, community members and government officials dated April 23,2013, approved
- Revised Consent Form- parents of participating students dated April 23, 2013, approved
- Revised assent form with diagram, approved
- Revised Recruitment letter – parents of participating students dated April 23, 2013, approved
- Recruitment Letter- community members and teachers dated April 10, 2013, approved
- Recruitment Letter – government officials fated April 7, 2013, approved
- Interview Outline – teachers, dated April 10, 2013, approved
- Interview Outline – Community Members, dated April 10, 2013, approved

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- Interview Outline – Government officials, dated April 10, 2013, approved
- Student Survey dated April 10, 2013, approved

<div align="center">MARK THE DATE</div>

This approval will lapse on **April 18, 2014**. It is your responsibility to ensure that the Ethics Renewal form is forwarded to the HREB office prior to the renewal date. *The information provided in this form must be* **current to the time of submission** *and submitted to* <u>HREB</u> **not** *less than 30 nor more than 45 days of the anniversary of your approval date.* The Ethics Renewal form can be downloaded from the HREB website http://www.hrea.ca.

The Health Research Ethics Board advises THAT IF YOU DO NOT return the completed Ethics Renewal form prior to date of renewal:

- *Your ethics approval will lapse*
- *You will be required to stop research activity immediately*
- *You may not be permitted to restart the study until you reapply for and receive approval to undertake the study again*

Lapse in ethics approval may result in interruption or termination of funding

It is <u>your responsibility to seek the necessary approval from the Regional Health Authority or other organization as appropriate.</u>

Modifications of the protocol/consent are not permitted without prior approval from the Health Research Ethics Board. Implementing changes in the protocol/consent without HREB approval may result in the approval of your research study being revoked, necessitating cessation of all related research activity. Request for modification to the protocol/consent must be outlined on an amendment form (available on the HREB website) and submitted to the HREB for review.

This research ethics board (the HREB) has reviewed and approved the research protocol and documentation as noted above for the study which is to be conducted by you as the qualified investigator named above at the specified site. This approval and the views of this Research Ethics Board have been documented in writing. In addition, please be advised that the Health Research Ethics Board currently operates according to *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans; ICH Guidance E6: Good Clinical Practice* and applicable laws and regulations. The membership of this research ethics board is constituted in compliance with the membership requirements for research ethics boards as defined by *Health Canada Food and Drug Regulations Division 5; Part C.*

Notwithstanding the approval of the HREB, the primary responsibility for the ethical conduct of the investigation remains with you.

We wish you every success with your study.

Sincerely,

(Vice-Chair)
Health Research Ethics Board

C C   VP Research c/o Office of Research, MUN
       VP Research c/o Patient Research Centre, Eastern Health
       HREB meeting date: May 2, 2013

HREB
NEWFOUNDLAND AND LABRADOR
HEALTH RESEARCH ETHICS BOARD

Ethics Office
Suite 200, Eastern Trust Building
95 Bonaventure Avenue
St. John's, NL
A1B 2X5

May 03, 2016

40 Tobin Crescent
St. John's, NL
A1A 2J3

Dear Ms. Doyle:

Researcher Portal File # 20170086
Reference # 2016.129

RE: "An Assessment of the Newfoundland and Labrador School Food Environment"

Your application received an expedited review by a sub-committee of the Health Research Ethics Board (HREB). *Full approval* of this research study is granted for <u>one year</u> effective **May 2, 2016**.

This is your ethics approval only. Organizational approval may also be required. It is your responsibility to seek the necessary organizational approval from the Regional Health Authority (RHA) or other organization as appropriate. You can refer to the HREA website for further guidance on organizational approvals.

This is to confirm that the HREB reviewed and approved or acknowledged the following documents (as indicated):

- Application, approved
- Letter to Minister of Education, acknowledged
- Information Flyer, approved
- School Survey, approved
- Budget, approved

<div align="center">

MARK THE DATE

</div>

This approval will lapse on May 2, 2017. It is your responsibility to ensure that the Ethics Renewal form is submitted prior to the renewal date; you may not receive a reminder. The Ethics Renewal form can be found on the Researcher Portal as an Event form.

If you do not return the completed Ethics Renewal form prior to date of renewal:

- ***You will no longer have ethics approval***
- *You will be required to stop research activity immediately*
- *You may not be permitted to restart the study until you reapply for and receive approval to undertake the study again*
- *Lapse in ethics approval **may result in interruption or termination of funding***

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You are solely responsible for providing a copy of this letter, along with your approved HREB application form; to Research Grant and Contract Services should your research depend on funding administered through that office.

Modifications of the protocol/consent are not permitted without prior approval from the HREB. **Implementing changes without HREB approval may result in your ethics approval being revoked, meaning your research must stop**. Request for modification to the protocol/consent must be outlined on an amendment form (available on the Researcher Portal website as an Event form) and submitted to the HREB for review.

The HREB operates according to the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans (TCPS2), the Health Research Ethics Authority Act (HREA Act) and applicable laws and regulations.

You are responsible for the ethical conduct of this research, notwithstanding the approval of the HREB.

We wish you every success with your study.

Sincerely,

██████████
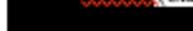
██████ (Chair, Non-Clinical Trials Health Research Ethics Board)
██████████ (Vice-Chair, Non-Clinical Trials Health Research Ethics Board)

CC: Dr M Traverso

A decision has been made on your amendment (approved)

3 messages

HREB.NCT@hrea.ca <HREB.NCT@hrea.ca>   28 June 2016 at 12:09
To: "Ms. Emily Doyle (Principal Investigator)" <emilyd@mun.ca>
Cc: "Dr. Martha Traverso-Yepez (Supervisor)" <MTRAVERSO@mun.ca>, HREB.NCT@hrea.ca

Researcher Portal File #: 20170086

This email is to inform you that a decision has been made on your amendment "An Assessment of the
Newfoundland and Labrador School Food Environment."

Please log on to the Researcher Portal to view the review decision of the amendment. (Approved)

Thank you!

████████

Health Research Ethics Authority

95 Bonaventure Avenue, Suite 200
St. John's, NL A1B 2X5

(t) 709-777-6974
(e) info@hrea.ca
(f) 709-777-8776
(w) www.hrea.ca

Emily Doyle <emilyd@mun.ca>   28 June 2016 at 12:16
To: HREB.NCT@hrea.ca

Thank you!
[Quoted text hidden]
--
Emily Doyle
PhD Candidate, Division of Community Health and Humanities
MUN Faculty of Medicine

Emily Doyle <emilyd@mun.ca>   24 October 2016 at 13:03
To: Emily Catherine Doyle <emilyd@mun.ca>