

Engaging Communities in Monitoring Local Food Environments: The Local Environment  
Action on Food (LEAF) Project

by

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A thesis submitted in partial fulfillment of the requirements for the degree of

Master of Science

in

Health Promotion and Socio-behavioural Sciences

School of Public Health  
University of Alberta

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## Abstract

**Background:** Children are increasingly exposed to food environments that have negative impacts on their diet and health. While the importance of creating and implementing programs and policies that change the collective determinants of eating behaviour is clear, *how* to achieve this goal remains unclear. Although some public support for food environment policies and programs exists in Canada, there is still a lack of public pressure for governments to act. Evidence supports the use of interventions that involve whole communities, use multi-level strategies, and consider multiple settings to promote healthy eating. Aligned with this approach is the Local Environment Action on Food (LEAF) project, a community-based health promotion intervention that aims to stimulate local action in changing food environments by engaging stakeholders in collecting local data and developing context-specific recommendations.

**Research Purpose and Questions:** This research explores how engaging communities in collecting and reporting on food environment data could potentially create action to promote healthy food environments. This research project addressed two overarching goals. Goal one addressed the LEAF process and was guided by the following research questions: 1. What are stakeholders' experiences of collecting and reporting on local food environment data? 2. What are the perceived barriers and facilitators to LEAF implementation and the LEAF process? Goal two addressed action for change and was guided by the following research questions: 3. If and how does LEAF and locally driven recommendations stimulate local action for change towards environments that support healthy eating? 4. What are the perceived barriers and facilitators to LEAF's success and sustainability?

**Methods:** A qualitative collective case study design using semi-structured interviews with a sample of 26 stakeholders explored LEAF stakeholder experiences of collecting food

environment data and creating change. Document review and participant observation aided in contextualization of interview data for goal one. Data collection and analysis were iterative, following Charmaz's constant comparative analysis strategy.

**Results:** Exploring goal one revealed two main themes: *building and maintaining relationships* and *process factors* that influenced LEAF and relationship building. Results suggested that a strengths-based approach to benchmarking food environments could prove beneficial. Furthermore, resulting themes provided support for the need for adaptable community interventions and demonstrated the importance of community context to intervention implementation. Exploring goal two revealed that LEAF had environmental and non-environmental impacts. Notably, LEAF created a context specific tool, a Mini Nutrition Report Card, that communities used to promote and support food environment action. Action was represented by the overarching theme *opening doors and continuing conversations*, which encompassed the diverse ways that LEAF stakeholders used their Mini-NRC. Further, analysis outlined perceived barriers and facilitators to creating food environment action at the community level, including *level of engagement, perceived controllability, community priorities, policy enforcement, resources, and key champions*.

**Conclusions:** Findings from this research support the use of community engagement in both food environment assessments and in health promotion interventions. This research has implications for research, practice, and policy. To promote sustainability of local food environment action, we recommend the creation of a web application to enable independent community food environment assessments and a communication network to allow communities to share challenges, successes, and resources relevant to creating healthy food environments.

Furthermore, we suggest the availability of financial resources allotted for policy influencers and health professionals to participate in community-based projects such as LEAF.

## **Preface**

This thesis is the original work of Breanne Aylward. The research project, of which this thesis is a part, represents one of the objectives under the Benchmarking Food Environments Project, which is led by Drs. Kim Raine, Candace Nykiforuk, Katerina Maximova, and Dana Olstad.

This research project received ethics approval from the University of Alberta Ethics Board, under the project names: “Impact of Benchmarking Food Environments: Key Informant Interviews” No. Pro00084508 (original ethics obtained on October 12, 2018; renewed on September 27, 2019) and “Impact of Benchmarking Food Environments: Engaging Local Communities in Monitoring Food Environments” No. Pro00069295 (original ethics obtained on October 16, 2018; renewed on October 2, 2019).

## **Acknowledgements**

I would like to thank my supervisor, Dr. Kim Raine, for her guidance, support, and expert advice. Kim, your encouragement and confidence in my abilities contributed immensely to making my graduate experience fulfilling. I would also like to thank my committee members, Dr. Kate Storey and Dr. Candace Nykiforuk, as well as my arms-length examiner, Dr. Maria Mayan, for providing valuable insight to make this research project stronger.

Thank you to the LEAF project coordinator, Krista Milford, for patiently answering all of my questions and helping me develop a deep understanding of the research context. A special thanks to all the LEAF communities and individuals that participated in this research. Your dedication to creating healthier food environments for children and youth is inspiring.

Finally, thank you to my family and friends for providing me with an amazing support system. To James, thank you for your endless patience, sacrifice, and willingness to lend an empathetic ear. To my parents, thank you for always encouraging me to pursue my interests and dreams. Your continual love and support throughout all of my endeavours is deeply appreciated.

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## **List of Abbreviations**

AHS: Alberta Health Services

Alberta NRC: Alberta's Nutrition Report Card on Food Environments for Children and Youth

CLO: Choose Least Often

CMO: Choose Most Often

LEAF: The Local Environment Action on Food Project

Mini-NRC: Mini Nutrition Report Card on Food Environments for Children and Youth

NCD: Non-Communicable Disease

TCPS2: Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans

WOC Intervention: Whole of Community Intervention

## Glossary of Terms

### General Terms

Community: “any group of people who share geographic space, interests, goals, or history”

(Institute of Medicine, 2012, p. 24)

Community Capacity-Building: “the increase in *community* groups’ abilities to define, assess, analyse and act on health (or any other) concerns of importance to their members”

(Labonte and Laverack, 2001a p. 114). Often viewed as a process, community capacity-building attempts to methodically develop the necessary individual and collective knowledge, skills, and competencies to achieve a community goal or better their circumstances (Laverack, 2014).

Community Engagement: “the process of working collaboratively with groups of people who are affiliated by geographic proximity, special interests, or similar situations with respect to issues affecting their well-being” (page 9) (CDC, 1997, as cited in Clinical and Translational Science Awards Consortium Community Engagement Key Function Committee Task Force on the Principles of Community Engagement, 2011).

Community Empowerment: “a social action process by which individuals, communities, and organizations gain mastery over their lives in the context of changing their social and political environment to improve equity and quality of life” (Wallerstein et al., 2015, p. 285).

Community-based Health Promotion Intervention: health promotion interventions that include members of the target community in the intervention development, implementation, and evaluation (although participation in each level may vary).

Food Environments: The “collective physical, economic, policy and sociocultural surroundings, opportunities and conditions that influence people’s food and beverage choices and nutritional status” (Swinburn, Vandevijvere, et al., 2013, p. 25).

Whole of Community Intervention: Interventions that involve whole communities and use multi-level, multi-component intervention strategies.

### **LEAF-Specific Terms**

Community Stakeholders: Individuals that reside and work in LEAF communities. This includes those that participated in LEAF and those that did not.

LEAF Community Group: The group of LEAF stakeholders that were involved in the LEAF process.

LEAF Project Lead: One or two individuals in each LEAF community that primarily led the LEAF process. Typically, these individuals were staff members from one of the research project’s organizational partners (e.g. public health dietitians working for Alberta Health Services).

LEAF Research Team: The group of individuals at the University of Alberta that provided support and guidance for LEAF communities.

LEAF Stakeholders: Community members that were involved in the LEAF process.

Setting Stakeholder: Individuals that work within target settings (e.g. schools) in LEAF communities.



## **Chapter 1: Introduction**

### **Food Environments and Children's Health**

Healthy eating is important for maintaining good health across one's lifetime, as it can protect against malnutrition and various non-communicable diseases (NCDs) (Government of Canada, n.d.; World Health Organization, 2018). Childhood is often considered a critical intervention period, as good nutrition during childhood promotes proper development and decreases a child's risk of developing overweight, obesity, and related NCDs (World Health Organization, 2018). Prevention is imperative, given that overweight and obesity have been demonstrated to track from childhood into adulthood (Herman et al., 2009; Singh et al., 2008). Children's eating behaviours are influenced by a range of collective and individual influences (Raine, 2005; Taylor et al., 2005). Individual determinants of eating behaviour include physiological factors, food preferences, nutritional knowledge, perceptions of healthy eating, and psychological factors (Raine, 2005). Collective determinants of eating behaviour can be classified into food environments, which Swinburn, Vandevijvere, et al. (2013) define as the "collective physical, economic, policy and sociocultural surroundings, opportunities and conditions that influence people's food and beverage choices and nutritional status" (p. 25). Governments, the food industry, and the general public all play a role in determining the status of food environments (Swinburn, Sacks, et al., 2013). Positive relationships between these parties could lead to the creation of healthy food environments for children. In particular, strong government policies and programming have the potential to positively influence children's food environments. However, children's exposure to unhealthy food environments continues to grow worldwide (World Health Organization, 2016). Experts have described the current state of Canada's food environments as unsupportive to maintaining healthy diets, as nutrient-poor,

energy-dense food items are cheaper, more readily available, and more heavily marketed than healthy food items (Vanderlee et al., 2017). Furthermore, results from *Alberta's 2019 Nutrition Report Card on Food Environments for Children and Youth*, hereafter referred to as Alberta's 2019 NRC (Benchmarking Food Environments, 2019), indicated that Alberta made little progress towards creating healthier food environments for young people since its implementation in 2015. Thus, many opportunities for improving Alberta's food environments remain.

### **Community Engagement in Food Environments**

Population-based approaches have been proposed to help promote good health and reduce the impact of a variety of health issues, including childhood obesity (World Health Organization, 2012), reducing and preventing tobacco use (Health Canada, 2018), and physical inactivity (World Health Organization, 2007). A multi-component, multi-setting community-based approach to improving Alberta's food environments for children and youth aligns with guidance from the World Health Organization's (2012) *Population-Based Approaches to Childhood Obesity Prevention*. However, intervention adaptation to the local context is important, given that community factors may determine how influential certain aspects of the food environment are (Health Canada, 2013). Incorporating local community knowledge through community engagement in such an intervention could aid in successful adaptation and promote sustainability (Staley, 2009; Wallerstein et al., 2015). Furthermore, multi-sectoral engagement could help determine which food environment policies and programs are feasible and acceptable to the wide range of affected stakeholders (Minaker, 2016). Strong public support for food environment policies is needed: without it, governments may be unable or unwilling to implement such supportive policies (Diepeveen et al., 2013). Recognizing that engaging local communities was an opportunity for improving Alberta's food environments, the Benchmarking Food

Environments team created the Local Environment Action on Food Project (hereafter referred to as LEAF).

### **The Local Environment Action on Food (LEAF) Project**

LEAF is a community-based health promotion intervention that has been implemented in communities across Alberta from June 2017 to present. LEAF builds on work done under the Alberta Nutrition Report Card on Food Environments for Children and Youth (Alberta NRC) (Benchmarking Food Environments Team, 2019), utilizing the provincial framework to engage local communities in monitoring and acting on their own food environments. By enabling communities to focus on numerous indicators of healthy food environments for multiple settings, LEAF promotes the use of multi-level, multi-component strategies. Participating communities work with the LEAF research team to create a *Mini Nutrition Report Card on Food Environments for Children and Youth* (Mini-NRC) that can be used to promote and support food environment action.

### **Research Purpose and Questions**

The purpose of this research project was to explore how engaging communities in collecting and reporting on food environment data could potentially create action to promote healthy food environments. As such, the first seven communities to complete LEAF were sampled to gain an understanding of the experience and impact of collecting food environment data and creating food environment recommendations. This research project was guided by the following research questions:

1. What are stakeholders' experiences of collecting and reporting on local food environment data?

2. What are the perceived barriers and facilitators to LEAF implementation and the LEAF process?
3. If and how does LEAF and locally driven recommendations stimulate local action for change towards environments that support healthy eating?
4. What are the perceived barriers and facilitators to LEAF's success and sustainability?

### **Rationale and Significance**

While LEAF bears potential to improve local and national food environments, gaining a deeper understanding of the implementation process is imperative. Given the vital role that community stakeholders played in LEAF, research is needed to understand their experiences with and perceptions of LEAF. Insights generated from this research could help adapt LEAF, as the exploration of community stakeholders' experiences will provide a greater understanding of what contributed to its perceived effectiveness or lack of effectiveness. Further, this research could contribute to the broader knowledge base by gaining an understanding of how communities can be engaged in local action for health-promoting change in food environments. This is critical, given that existing public support for creating healthier food environments has been characterized as “quiet support” (Vandevijvere et al., 2019, p. 277).

### **Thesis Overview**

This thesis is organized into seven chapters. Chapter two provides an in-depth review of pertinent literature, including food environments, population-based approaches in health promotion, and the purpose and process of LEAF. Chapter three provides a detailed description of the research setting and methods. Results of this research project were split into two chapters, representing findings for two overarching goals (process and action): chapter four presents

results pertaining to the first and second research questions, while chapter five presents results pertaining to the third and fourth research questions. Chapter six provides a discussion of the research findings, integrating results from chapters four and five. Lastly, chapter seven presents an overall conclusion to the research project and outlines its strengths and limitations, potential implications, and future directions.

## Chapter 2: Literature Review

### Diet and Health

Healthy eating is important at all stages of life. Healthy eating protects against all forms of malnutrition, which the World Health Organization (2018) outlines as “undernutrition (wasting, stunting, underweight), inadequate vitamins or minerals, overweight, obesity, and resulting diet-related noncommunicable diseases” (para. 1). Furthermore, poor diet can have a broad range of negative consequences at all stages of life. For example, hunger and food insecurity can negatively impact a child’s overall health, cognitive development, and school performance (Centers for Disease Control and Prevention, n.d.). Unhealthy diet is a substantial and preventable contributor to many NCDs and chronic conditions, including obesity, cardiovascular disease, certain cancers, and type 2 diabetes (Public Health Agency of Canada, 2005; Vanderlee et al., 2017). Childhood is often viewed as a critical intervention period, as overweight and obesity have been demonstrated to track from childhood into adulthood (Herman et al., 2009; Singh et al., 2008). Furthermore, there is some evidence to suggest that eating behaviours formed in childhood persist into adulthood (Mikkilä et al., 2005; Movassagh et al., 2017).

Unhealthy diets are a global issue, given that dietary risk factors, such as diets low in fruits and vegetables or diets high in sugar and sodium, accounted for one in five deaths worldwide in 2017 (Afshin et al., 2019). Poor diet is a leading behavioural risk factor for death worldwide, including in Canada (Institute for Health Metrics and Evaluation, 2017). Of particular concern are diets high in added sugar, saturated and trans fat, and sodium, as excess consumption of these nutrients of concern can increase one’s risk for obesity and NCDs (Government of Canada, 2019c; Vanderlee et al., 2017). Examining the current level of sodium

intake among Canadians provides one example of the alarming reality and potential public health impact of unhealthy diets in Canada. Using the most recently available national data, Health Canada (2018b) found that more than half of all Canadians over one year of age consume excess amounts of sodium (defined as above the maximum recommended intake of 2300 mg per day). Furthermore, approximately three-quarters of children between four and 13 years of age consume more sodium than the maximum recommended intake (Health Canada, 2018b). Among other things, excess sodium intake is linked to high blood pressure (Sodium Working Group, 2010). In fact, an estimated 30% of high blood pressure cases in Canada have been attributed to excess sodium intake (Joffres et al., 2007).

## **Food Environments**

### ***Individual and Collective Determinants of Eating Behaviour***

Historically, eating behaviours have been characterized in an overly simplistic manner: an individual makes a conscious selection of the food they eat. Within this lifestyle model, unhealthy food choices are equated to individual responsibility. Thus, one can choose to eat healthy foods and experience positive health outcomes, or one can choose to eat unhealthy foods and experience negative health outcomes. Although it may be true that some individuals have a greater degree of control over their food choices, eating behaviours are far more complex than afforded by this model. In fact, eating behaviours are shaped by a wide range of individual and collective determinants (Raine, 2005; Taylor et al., 2005).

Individual determinants of eating behaviour can vary greatly among a population and include physiological factors (such as age), food preferences, nutritional knowledge, perceptions of healthy eating, and psychological factors (Raine, 2005). The collective determinants of eating behaviour are the contextual factors that structure the environments where we live, work, and

play (Raine, 2005). The collective determinants of eating behaviour can be artificially separated into categories, or food environments. Swinburn, Vandevijere, et al. (2013) define food environments as the “collective physical, economic, policy and sociocultural surroundings, opportunities and conditions that influence people’s food and beverage choices and nutritional status” (p.25). This definition outlines that food environments are broad and contextual, spanning from local influences to governmental influences. To simplify, Swinburn et al. (1999) characterize the physical, economic, political, and sociocultural environments as “what is available,” “what are the costs,” “what are the rules,” and “what are the attitudes and beliefs,” (p.565) respectively. Others (Benchmarking Food Environments Team, 2019; Brennan et al., 2011) have included the communication environment, which encompasses the messages individuals hear about food (e.g. food marketing or nutrition education). Thus, individual eating behaviours are restricted or supported by food environments.

The notion that supportive environments are imperative for the optimal health of individuals and populations gained recognition in 1986, with the creation of the *Ottawa Charter for Health Promotion* (World Health Organization, 1986). The acceptance of environmental influences on eating behaviours is not inherently at odds with the lifestyle model if we consider Breslow’s (1996) argument that lifestyle “consists of ways of living, the patterns of behavior, in the circumstances of one’s life” (p.253). If we accept this statement, it naturally follows that supportive food environments must exist to live a healthy lifestyle and make healthy choices.

### ***Food Environments and Health***

For the purposes of this review, the term unhealthy food environments will refer to those that are not conducive to maintaining a healthy diet: where nutrient-poor, energy-dense food items are cheaper, more readily available, and more heavily marketed than healthy food items



(Vanderlee et al., 2017). Minaker and colleagues (2016) argue that unhealthy diets are possibly a “logical response” (p. eS4) to such unsupportive environments. For example, unhealthy food choices might be considered the logical response for schoolchildren attending schools saturated with unhealthy food options (e.g. vending machines full of sugar-sweetened beverages). Supportive, or healthy, food environments will refer to those that are conducive to maintaining a healthy diet: where “foods, beverages and meals that contribute to a population diet meeting national dietary guidelines are widely available, affordably priced and widely promoted” (Swinburn, Sacks, et al., 2013, p. 2). Furthermore, healthy food environments are those where opportunities and infrastructure exist for organizations to promote healthy eating (Rideout et al., 2015).

It is problematic that children’s exposure to unhealthy food environments is growing worldwide and is increasingly affecting countries of all income levels and all socioeconomic groups (World Health Organization, 2016). Overall, the current Canadian food environment has been described as unsupportive of maintaining a healthy diet (Vanderlee et al., 2017). This is problematic, given that food environments can impact an individual’s diet-related health outcomes (Health Canada, 2013). Swinburn, Sacks, et al. (2013) describe the effect of unhealthy food environments as “a supply-side push” (p. 2), promoting the consumption of an unhealthy diet. In keeping with the previous example of sodium consumption, it is instructive to explore how the status of the current food environment impacts sodium intake in Canadians. In 2012, Health Canada created voluntary sodium reduction guidelines for food industries (Health Canada, 2012). The decision to target food industries was in part due to the fact that the majority of dietary sodium comes from processed food sources (Sodium Working Group, 2010). However, a recent evaluation of industry’s voluntary efforts found insufficient sodium

reductions, as roughly half of the food categories assessed did not make significant progress toward sodium reduction (Health Canada, 2018c). Even more troubling is the fact that some food categories had an increase in sodium content (Health Canada, 2018c). Thus, through the creation of an unhealthy physical environment, where high-sodium products are widely available and accessible, the food industry is continuing to contribute to individual's consumption of dangerous levels of sodium and related negative health outcomes.

Globally, organizations have begun to accept the influence of food environments. For example, the World Health Organization (2016) has acknowledged that poor diet is not solely the result of individual choice, highlighting the strong negative impact of unhealthy food environments. Associations between aspects of food environments and individuals' diet-related outcomes have been demonstrated in the Canadian context (Health Canada, 2013). However, food environment research is still young, and inconsistencies exist within the field, such as usage of terminology and assessment methods (Health Canada, 2013). The diversity of methods used for measuring food environments may be less problematic if we consider the importance of context. There may not be a gold standard measure that accurately reports the food environments for every town, city, or country (Health Canada, 2013). Further, food environment assessments are often used to increase awareness of how eating behaviours are impacted by factors beyond individual choice (Minaker, 2016). If food environment measures and assessments successfully raise awareness about the importance of food environments, they could prove to be an effective tool for changing the current individual-focused dialogue. However, a clear and comprehensive understanding of Canadian food environments is imperative for policy and program development.

## **Food Environment Action in Canada**

### ***Current Drivers of Food Environments***

Food environments are shaped by influences from and relationships between the private food industry, all levels of government, and the general public (Swinburn, Sacks, et al., 2013). The most visible examples of food industry influence are within the physical, economic, and communication environments. The food industry has influence over the quality and type of foods available (physical environment); the cost of food (economic environment); and food-related messages, which are controlled through advertisements (communication environment) (Swinburn, Sacks, et al., 2013). Government policies can also influence food environments through a number of strategies, including setting boundaries within which the private food industry must work. For example, governments can influence the economic environment by regulating food prices through taxes and subsidies (Swinburn, Sacks, et al., 2013). Governments can also influence the communication environment by legislating nutrition education in school curricula, the physical environment through zoning bylaws, and the sociocultural environment through public health media campaigns. In theory, positive interactions between the government, the food industry, and the general public could result in healthy food environments that are supportive of positive health outcomes.

### ***Government Action to Improve Canadian Food Environments***

Government action is imperative to creating healthy food environments for Canadian citizens. Although Canadian policymakers and leaders have long since recognized that healthy eating is not completely an individual choice, nutrition policies have generally not addressed the contextual factors that push individuals towards unhealthy eating (Olstad et al., 2019). In 2010, Canada's Federal, Provincial, and Territorial Ministers of Health made unhealthy eating a

collective priority, creating a framework to address it titled *Curbing Childhood Obesity: A Federal, Provincial, and Territorial Framework for Action to Promote Healthy Weights* (Government of Canada, 2010). A recent report by the Pan-Canadian Public Health Network (2017) concludes that Canadian childhood obesity rates have remained high and stable since the framework's adoption in 2010. They call on the government to continue investing in upstream prevention and forming partnerships that will aid in building healthier and more supportive environments. In 2016, Health Canada initiated their *Healthy Eating Strategy* that aims to improve food environments in Canada (Health Canada, 2016). By recognizing the contextual factors that influence one's ability to eat healthy, their goal is to make the healthier choice the easier choice for all Canadians. Health Canada's strategy addresses four main areas: improving healthy eating information, improving the nutritional quality of foods, protecting vulnerable populations, and supporting increased access to and availability of nutritious foods. Since implementation, some notable positive changes include a revamped national food guide (Government of Canada, 2019a), updates to make nutrition facts tables more comparable, a national ban on industrially produced trans fat, and expansion of the Nutrition North Canada program (Government of Canada, 2019b). These changes display promise of progress towards healthier food environments in Canada, but more change is still needed. For example, although the revised *Canada's Food Guide* (Government of Canada, 2019a) and *Canada's Dietary Guidelines for Health Professionals and Policy Makers* (Health Canada, 2019) can act as resources to support policy change in food environments, they still require human power to enact change. Further, Campbell and Greene Raine (2019) argue that the current inability to pass Bill S-228 (The Child Health Protection Act) suggests that more advocacy is needed in order to protect vulnerable populations, in this case children, from exposure to the powerful influence of

unhealthy food marketing. Additionally, many of these innovations enable Canadians to make a more informed choice, but they do not address the social determinants of health that may be the fundamental issues leading to poor diet for some individuals (Olstad et al., 2019).

### ***Public Action to Improve Canadian Food Environments***

Government is not solely to blame for the lack of action to improve food environments and relevant policies. Without strong support from the general public, governments may be unable or unwilling to prevent interference from the private food sector (Popkin et al., 2013) or implement supportive policies (Diepeveen et al., 2013). Although there has been recent public support for action to create healthier food environments in Canada (Bhawra et al., 2018; Kongats et al., 2019), more pressure from the general public is critical to create successful food programs and policies. This is not a simple task. Although not specific to Canada, cited reasons for weak public support for food policies include “a lack of civil organizations; low funding; weak coordination; low priority for the issue; and a lack of capacity, skills and policy-relevant evidence” (Popkin et al., 2013, p. 5). In order to overcome these barriers and turn public support into action, Vandevijvere et al. (2019) argue that various tools need to become available to citizens. Furthermore, multi-sectoral action is needed to determine which policies and programs are feasible and acceptable to the wide range of affected stakeholders (Minaker, 2016). The use of a population-based approach may provide a beneficial method of creating and disseminating the necessary tools.

## **Population and Community-based Approaches to Improving Food Environments**

### ***Population-based Approach***

Pioneered by Geoffrey Rose (1985), the population-based approach argues that lowering risk factors across an entire population could lead to a greater reduction in disease rates than could be achieved by targeting solely high-risk populations. To achieve population-level reductions in disease risk, population-based approaches focus on changing the conditions under which disease arise (Frohlich, 2014; Rose, 1985). Put another way, the population-based approach “attempts to remove the underlying causes that make the disease common” (Rose, 1985, p. 37). Government agencies and influential organizations have called for the use of population-based approaches to address numerous health issues, including childhood obesity (World Health Organization, 2012), reducing and preventing tobacco use (Health Canada, 2018a), and physical inactivity (World Health Organization, 2007). In their population-based strategy to prevent childhood obesity, the World Health Organization (2012) specifically outlines three areas for action: structural aspects within the government, such as dedicated funding for health promotion; population-wide policies and initiatives; and multi-component, multi-setting community-based interventions.

### ***History and Evolution of Community-based Approaches in Health Promotion***

Although Silver (2010) argues that community approaches have guided public health since the days of John Snow and the Broad Street pump, the term community-based health intervention emerged during the 1960s. In an attempt to address the growing threat of chronic disease, particularly cardiovascular disease, public health researchers and professionals began turning to community-based health interventions (Silver, 2010). In part, this increased interest in community approaches to behaviour change reflected the growing acceptance of the

environmental influences on behaviour (Thompson & Kinne, 1999). Spurred by the success of the North Karelia Project and Stanford Three-Community Study, several early community-based heart health interventions used these studies as models for intervention design, including the Stanford-Five City Project, the Minnesota Heart Health Project, and the Pawtucket Heart Health Project (Merzel & D’Afflitti, 2003). Evidence from these interventions and other community-based prevention programs during the 1980s and 1990s revealed limited population-wide success in reducing risk behaviours and health outcomes (Merzel & D’Afflitti, 2003). After synthesizing the literature, Merzel and D’Afflitti (2003) conclude that a wider impact may have occurred if these early interventions had targeted social norms and policies, in addition to the individual factors that many interventions addressed through education. Similarly, within public health nutrition, interventions that focus entirely on providing nutrition-related knowledge and skills have displayed limited effectiveness (Contento, 2008). Among other things, Contento (2008) argues that nutrition education must include an environmental component, “where nutrition educators work with policymakers and others to promote environmental supports for action” (p. 178). The result of this comprehensive approach would be nutrition education conducted in an environment that is supportive of the suggested behaviours. Increased interest in community approaches to healthy eating and obesity prevention reflects the growing acceptance of the environmental influences on diet. Given that children generally do not have influence over the environments that they live, study, and play in, community-based approaches are of particular use for this population (Bleich et al., 2013).

Over the past decades, public health researchers and professionals have continued to develop community-based interventions placing more focus on community capacity-building (Silver, 2010). Community capacity-building can be defined as “the increase in *community*

groups' abilities to define, assess, analyse and act on health (or any other) concerns of importance to their members" (Labonte and Laverack, 2001a p. 114). Often viewed as a process, community capacity-building attempts to methodically develop the necessary individual and collective knowledge, skills, and competencies to achieve a community goal or better their circumstances (Laverack, 2014). Further, more recent community-based health interventions have focused on adapting to the community context and creating sustainable changes through policy (Silver, 2010). While early community-based health interventions used theories of change that focused on the individual-level, recent efforts have embraced ecological theories in an attempt to produce change at multiple levels (also referred to as multi-level) (Silver, 2010).

### ***Community-based Health Promotion and The Social Ecological Approach***

Originating in biological sciences, ecology is the study of the relationships between organisms and their physical surroundings, or environments (Sallis & Owen, 2015). Ecological models applied within health promotion fall under the term social ecology, as they give more focus to the social, organizational/intuitional, and cultural aspects of environment than earlier versions (Richard & Gauvin, 2017; Stokols, 1992). With the shift in emphasis from disease treatment to disease prevention and health promotion (Stokols, 1996), the 1980s gave rise to a resurgence of interest in ecological approaches (Richard & Gauvin, 2017). As interest in an ecological approach grew, so did the number of specialized models (Sallis & Owen, 2015). One core principle of the ecological approach is the reciprocal relationship between behaviour and the environment: environments act to determine individual behaviour, but individuals also act to determine the status of environments (Green et al., 1996; Stokols, 1992). Thus, interventions need to address individual and environmental factors, as they are intricately connected.



The ecological perspective acts as a “conceptual framework designed to draw attention to individual and environmental determinants of behaviour” (McLaren & Hawe, 2005, p. 9), that can be used to guide intervention development and implementation (Richard & Gauvin, 2017). Represented visually, the framework often consists of nested circles, representing the levels of influence on behaviour (McLaren & Hawe, 2005). Characterization of the levels of influence on behaviour varies among ecological models. For example, Bronfenbrenner (1979) categorizes the levels into micro-, meso-, and exo-systems; McLeroy et al. (1988) categorize the levels as intrapersonal, interpersonal, institutional, community, and policy. Outlining multiple levels of influence for a given behaviour enables the creation of a wider range of interventions and the possibility of affecting a wider population (Sallis & Owen, 2015). For example, policy interventions can affect entire communities, unlike individual-level interventions that only impact participants (Sallis & Owen, 2015).

However, it has been argued that theorizing about the ecological approach in health promotion interventions is weak (Hawe et al., 2009). The absence of a detailed understanding of ecological approaches has been attributed, at least in part, to their high level of complexity (Green et al., 1996). Improper application of theory or lack of theoretical thinking in health promotion interventions can have negative effects. To illustrate this, Hawe, Shiell, and Riley (2009) point to the failure of several early community-based health interventions, such as the Stanford Heart Disease prevention project, which used individual-level theory in an attempt to achieve population-level prevention of heart disease. Further, Richard and Gauvin (2017) argue that most of the current ecological models applied in health promotion do not stress the importance of a key health promotion concept: community participation.

## ***Community Engagement***

Although interest in community approaches and interventions is rising across fields, the term *community* can take on a variety of meanings depending on the field of study (Rissel & Bracht, 1999). Defining community is further complicated by the growing use of electronic forms of communication, as it makes the inclusion of geographic proximity in the definition of community less imperative (Thompson & Kinne, 1999). Although a common universal definition may not be necessary, explicitly outlining one's definition of community and its components is vital for readers' understanding, as it influences their view on the processes that follow (e.g. community engagement) (Wallerstein et al., 2015). Here, community will be defined as "any group of people who share geographic space, interests, goals, or history" (Institute of Medicine, 2012, p. 24).

Community engagement has been proposed as a way to empower populations, thus enabling them to improve their health status (Brunton et al., 2017). Adhering to the hierarchy outlined by O'Mara-Eves et al. (2013), engagement is the umbrella term that subsumes information, consultation, development, participation, and empowerment (the narrowest term). Thus, community engagement is diverse: partners can exist at a variety of levels (e.g. institutions or individuals), and it can occur in practice, research, and policymaking (Clinical and Translational Science Awards Consortium Community Engagement Key Function Committee Task Force on the Principles of Community Engagement, 2011). The dominant view of community engagement is a "consensus-building orientation" (Wallerstein et al., 2015, p. 283), as demonstrated by the CDC's definition: "the process of working collaboratively with groups of people who are affiliated by geographic proximity, special interests, or similar situations with respect to issues affecting their well-being" (page 9) (CDC, 1997, as cited in Clinical and

Translational Science Awards Consortium Community Engagement Key Function Committee Task Force on the Principles of Community Engagement, 2011).

### ***Community-based Health Promotion Interventions***

Community-based health promotion interventions will refer to those that include members of the target community in the intervention development, implementation, and evaluation (although participation in each level may vary). This differentiates community-based interventions from community-placed interventions, which are those that are developed without the involvement of members of the target community (Institute of Medicine, 2012). Further, types of community-based interventions will be differentiated by following the typology set forth by McLeroy et al. (2003). In this typology, a community-based intervention can be categorized as one of the following: community as setting, community as target, community as agent, and community as resource. However, as recognized by McLeroy and colleagues (2003), categorization is not always clean-cut, and interventions may borrow aspects from the other categories.

### ***Whole of Community Interventions***

Interventions that involve whole communities and use multi-level, multi-component intervention strategies (hereafter referred to as WOC interventions) to prevent and reduce population obesity prevalence are receiving increased attention worldwide (Wolfenden et al., 2014). In the past, many interventions were framed as “obesity prevention,” were designed without community input, and were implemented within a single setting for a short period of time. In fact, a 2011 Cochrane review of child-directed obesity prevention interventions found that of the 55 included studies, the majority were implemented in education settings and were in

place for less than 12 months (Waters et al., 2011). Additionally, most interventions in the review utilized behaviour change theories, targeting individual change. Recognizing the health impacts of healthy eating and physical activity beyond obesity, we suggest the use of the term *healthy eating intervention* when diet and nutrition are the central intervention focus, or *healthy eating and physical activity intervention* when diet and physical activity are both central to the intervention. However, the term *obesity prevention intervention* was retained where it was originally used.

A recent systematic review and meta-analysis found that WOC healthy eating and physical activity interventions have demonstrated some effectiveness in reducing population weight-gain among children (Wolfenden et al., 2014). Further, multi-level, multi-component obesity prevention interventions have also demonstrated other individual-level impacts, such as increased intake of healthy foods and beverages (Ewart-Pierce et al., 2016). After reviewing the literature, Ewart-Pierce and colleagues (2016) argue that the most promising multi-level, multi-component obesity prevention interventions appear to be those that integrate policy and community-level strategies. WOC obesity prevention interventions also demonstrate evidence of promoting health equity, as a systematic review found that the majority of included interventions reported effectiveness to be greater or equal in lower socioeconomic groups when compared to higher socioeconomic groups (Boelsen-Robinson et al., 2015). Equitable interventions in this review commonly included environmental change strategies, operated in multiple settings, and incorporated community engagement into intervention development and implementation. An equitable approach to increasing healthy eating is critical, given that in developed countries (including Canada), groups of higher socioeconomic status generally have healthier diets (Power, 2005).

## Community Context

Although not specific to community-based interventions, the World Health Organization (2009) found the most successful diet interventions to be those that were adapted to the local context and included multiple components. This review provided implementation insights, such as utilizing existing social structures in the community (e.g. regularly scheduled meetings), as well as participant involvement in planning and implementing the intervention. Gaining an understanding of the community context is crucial and should be considered when developing, implementing, and evaluating an intervention or program. Community factors, such as area-level income, may determine how influential certain aspects of the food environment are (Health Canada, 2013). Advocates of community approaches have outlined the importance of community context and intervention adaptability. For example, Trickett (2019) argues that integrating local knowledge and values are vital to solving “wicked problems” (characterized as “complex, intractable, unpredictable, and open-ended” (p. 205)). Further, Green et al. (1996) argue that in the context of health promotion, this implies that there is no gold standard intervention that can be applied to all situations equally. As alluded to in previous sections, the high prevalence of unhealthy food environments in Canada is a “wicked problem.” Solutions to this wicked problem could benefit from the integration of local knowledge and values, rather than the direct application of interventions deemed “effective” under strictly controlled trials. In line with this evidence, along with the goals of the Canadian Ministers of Health and Health Canada’s *Healthy Eating Strategy*, is a community-based intervention titled the Local Environment Action on Food project (LEAF).

## **The Local Environment Action on Food (LEAF) Project**

LEAF was developed by the team that created the Alberta NRC, an annual assessment of Alberta's food environments and nutrition policies (Benchmarking Food Environments Team, 2019). The Alberta NRC applies the concept of *benchmarking* (rating performance in selected areas to allow for comparison (Martin et al., 2014)) to government action in food environments to create “a novel tool to monitor the state of children's food environments and supportive policies, inform stakeholders of the state of these environments and policies, engage society in a national discussion, and outline a policy-relevant research agenda for further study” (Olstad et al., 2014, p. 294). The Alberta NRC consists of five food environments: the physical, communication, economic, social, and political environments. Within these environments are 37 indicators that are used to assess the quality of the food environments and policies. Each indicator contains best practice benchmarks, or examples of strong policies and actions. Development of the Alberta NRC is reported elsewhere (Olstad et al., 2014).

LEAF was created to involve community members across Alberta in the discussion of how to improve their food environments. In order to create local recommendations for action, data specific to participating communities was required. The necessity of local recommendations was due to the Alberta NRC's focus on higher-level provincial policies, since it utilizes publicly available data. LEAF engages members of Alberta communities in monitoring their own food environments, as well as generating and acting upon recommendations aimed at creating healthier food environments. In conjunction with the LEAF research team, participating communities co-create a Mini-NRC in an iterative and recursive process (described in Figure 1). The Mini-NRC aims to identify what is working well within the community and areas that need improvement, help focus local efforts and develop concrete goals, act as a tool to ask for local

changes, and measure change in local food environments over time (if repeated). By building upon existing connections with Alberta Healthy Communities (within Population Public and Indigenous Health of AHS) and Alberta Health Services (AHS) Nutrition Services, Population & Public Health Strategy, LEAF has been implemented in 19 communities across Alberta to date.

Following the typology of community-based interventions outlined by McLeroy et al. (2003), LEAF most closely aligns with the “community as target” category. The desired outcome of LEAF is an improvement in the selected indicators of community health, rather than changes to individual behaviours. However, LEAF incorporates aspects from other categories. From the “community as resource” category, LEAF borrows that community ownership is an essential component for sustainable positive change in community outcomes. Furthermore, LEAF encourages the use of multi-level and multi-component intervention strategies, as communities collect data and create recommendations for a range of settings, environments, and indicators. The ultimate goal of LEAF is community empowerment to act on food environments, where community empowerment is defined as “a social action process by which individuals, communities, and organizations gain mastery over their lives in the context of changing their social and political environment to improve equity and quality of life” (Wallerstein et al., 2015, p. 285).

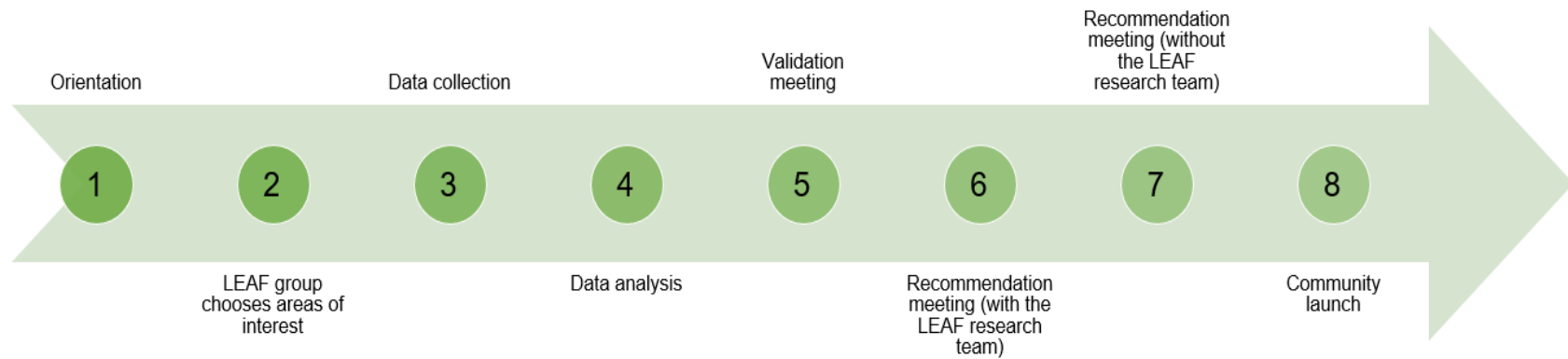
### ***The LEAF Process***

LEAF is introduced to communities through several means. Typically, a staff member of one of LEAF’s organizational partners (see Appendix A) introduces LEAF to an existing community group that has an interest in healthy eating and healthy food environments. These community groups are often formed on a voluntary basis and meet regularly to improve their local community. By undertaking LEAF, these groups hope to gain the necessary knowledge,

skills, and tools required to improve their local food environments. However, some communities that have undertaken LEAF have not had pre-existing community groups leading the process. In these communities, staff from the organizational partners lead the LEAF process and engage relevant community partners where possible. Once a community chooses to participate in LEAF, the following process ensues:



**Figure 1. The LEAF Process**



1. Orientation: led by the LEAF research coordinator, the orientation provides a background on the Alberta NRC and the Online Indicator Data Collection Tool. The Online Indicator Data Collection Tool is an app developed by the LEAF research team that enables the quick collection of food environment data using smartphones, tablets, or a desktop computer.
2. LEAF group chooses areas of interest: Using the Alberta NRC as a guide, each LEAF community group chooses the settings (schools, childcare, recreation facilities, and other public buildings), areas of interest (nutrition-related community resources and local policies), and indicators (“key areas where it is important to take action to improve children’s eating behaviour” (Ferdinands et al., 2020, p. 2)) that they wish to report on. Development of the indicators and the Alberta NRC is reported elsewhere (Olstad et al., 2014).

3. Data collection: Community stakeholders use the Online Indicator Data Collection Tool to collect information relevant to the chosen indicators, settings, and areas of interest. Data collection can be done manually, through typing relevant text, or by uploading a picture or document.
4. Data analysis: Once the indicator data is complete, the LEAF research team analyzes and grades it, creating a draft Mini-NRC.
5. Validation meeting: the LEAF research team and LEAF community group meet to ensure that the draft Mini-NRC is representative of the data collected. Necessary revisions are subsequently be made by the LEAF research team.
6. Recommendation meeting (with the LEAF research team): The LEAF research team provides support as the LEAF community group begins to develop specific recommendations using the Alberta NRC as a guide.
7. Recommendation meeting (without the LEAF research team): The LEAF community group meets privately to finalize the recommendations for their community. Finalized recommendations are incorporated into the final version of the community's Mini-NRC by the LEAF research team.
8. Community launch: How the LEAF community group decides to launch their Mini-NRC is largely under their control, but support and guidance is provided by the LEAF research team.

## Study Significance

While the importance of creating and implementing programs and policies that change the collective determinants of eating behaviour is clear, *how* to achieve this goal remains unclear. Although some public support for food environment policies exists in Canada (Bhawra et al., 2018; Kongats et al., 2019), there is still a lack of public pressure for governments to act. Community-based health promotion interventions may be a promising strategy to overcome these barriers and build public pressure, given their capacity-building orientation. Furthermore, collaboration with local residents may aid in creating and implementing food environment interventions that are appropriate for the community context. Therefore, a community-based intervention that engages community members in monitoring and acting on their own food environments could help build the necessary food environment evidence base and create a sense of urgency for action. Aligned with this approach is the Local Environment Action on Food project, a community-based health promotion intervention that engages local communities in benchmarking food environments.

LEAF bears potential to improve Alberta's local food environments through community engagement in benchmarking food environments. In addition to creating local recommendations, the potential exists for locally collected data to be integrated into the Alberta NRC. This could result in more comprehensive and representative future reports, providing researchers and policymakers with a more comprehensive view of Alberta's food environments. Furthermore, highlighting local initiatives in the Alberta NRC could allow all Alberta communities, regardless of participation in LEAF, to learn from each other. If implemented across Canada, local engagement in benchmarking food environments could create a clearer picture of national food environments and a broader discussion about what should be done to improve them. However,

before forming conclusions on context-specific and generalizable information from LEAF, it is important to understand what was implemented and how it was implemented. Exploring the contextual factors and adaptations made to LEAF could help better understand what contributed to its perceived effectiveness or lack of effectiveness. Given the vital role that community stakeholders played in LEAF, research is needed to understand their experiences with and perceptions of LEAF. Stakeholders' understandings of LEAF, including its perceived success and sustainability, will help inform the future development of LEAF. Furthermore, these understandings may provide valuable insight beyond the context of LEAF, including increasing comprehension of how public support for food environments could be turned into action at the community level. Thus, this research project aims to explore how engaging communities in collecting and reporting on food environment data could potentially create action to promote healthy food environments.

## Chapter 3: Methodology

### Research Overview

This chapter outlines the research setting and methodology that were common for both goals included in this research project. Although both goals drew from the same dataset and used participant interviews as their primary data collection strategy, their reliance on supplementary data collection strategies differed slightly. See Table 1 for a general overview of the methods.

**Table 1. Overview of Research Methods**

	Goal One (Chapter 4)	Goal Two (Chapter 5)
Research Questions	<ol style="list-style-type: none"> <li>1. What are stakeholders' experiences of collecting and reporting on local food environment data?</li> <li>2. What are the perceived barriers and facilitators to LEAF implementation and the LEAF process?</li> </ol>	<ol style="list-style-type: none"> <li>3. If and how does LEAF and locally driven recommendations stimulate local action for change towards environments that support healthy eating?</li> <li>4. What are the perceived barriers and facilitators to LEAF's success and sustainability?</li> </ol>
Study Design	Qualitative collective case study	
Primary Data Collection Strategy	Participant interviews	
Supplementary Data Collection Strategies	Documents and participant observation <sup>a</sup>	N/A
Data Analysis	Constant comparison	

<sup>a</sup>Although documents and participant observation helped guide the interview process, thus contributing to both goals, they primarily acted as supplementary strategies for goal one.

### Setting

The setting of this research project is LEAF, a community-based health promotion intervention conducted in communities across Alberta. LEAF began in June 2017 and continues to this date. Included in this research project are the first seven communities that completed LEAF (community descriptions below).

I came onto the project in September 2018 as a master's student and graduate research assistant. At this point, only the first two communities had completed LEAF. Although my role was initially limited to conducting participant interviews, in May 2019 my role broadened to

include the following: attending LEAF teleconference meetings, such as the validation and recommendation meetings; assisting with the development of several communities' Mini-NRCs, including condensing community-driven data and recommendations into the report and infographic; and providing support at the launch of several communities' Mini-NRCs. Through these experiences, I have been able to connect and build rapport with involved LEAF project leads and other community members involved in LEAF (collectively referred to as LEAF stakeholders) from five of the communities involved in this research project. I have gained insight into the process of creating a Mini-NRC, including important contextual differences in each community. Furthermore, my regular meetings with the principal investigator, Dr. Kim Raine, and project coordinator, Krista Milford, have deepened my understanding of the project.

The seven LEAF communities involved in this thesis research are as follows:

- Community A: a rural area in the central zone of Alberta (Alberta Health Services, n.d.) with a population of approximately 950 people (Statistics Canada, 2017a).
- Community B: a rural area in the central zone of Alberta (Alberta Health Services, n.d.) with a population of approximately 950 (Statistics Canada, 2017a).
- Community C: a small population centre in the central zone of Alberta (Alberta Health Services, n.d.) with a population of approximately 3,500 people (Statistics Canada, 2017a).
- Community D: a small population centre in the south zone of Alberta (Alberta Health Services, n.d.) with a population of approximately 15,000 people (Statistics Canada, 2017a).

- Community E: a medium population centre in the south zone of Alberta (Alberta Health Services, n.d.) with a population of approximately 65,000 people (Statistics Canada, 2017a).
- Community F: a small population centre in the central zone of Alberta (Alberta Health Services, n.d.) with a population of approximately 6,000 people (Statistics Canada, 2017a).
- Community G: a small population centre in the north zone of Alberta (Alberta Health Services, n.d.) with a population of approximately 2,500 people (Statistics Canada, 2017a).

### **Community Context**

As shown above, the LEAF communities included in this research were diverse in size. As defined by Statistics Canada (2017b), there was one medium population centre, four small population centres, and two rural areas. LEAF communities were spread across Alberta, with two located in the south zone, four in the central zone, and one in the north zone (Alberta Health Services, n.d.). Furthermore, LEAF communities varied on aspects that contributed to their economic and political context, such as the primary industry or foci of local government priorities. Also, LEAF communities all had different histories with healthy eating and food-related initiatives. Participants felt that these factors influenced their experiences with and the potential impact of LEAF. As such, communities utilized tailored strategies to create and use their Mini-NRC. Whenever possible, these factors will be embedded within the results to demonstrate their impact.

## **Research Paradigm and Theoretical Perspective**

Guided by the constructivist perspective, this research adopted a relativist ontology and a subjectivist epistemology; it acknowledges the existence of multiple realities that are co-constructed by the researcher and participants (Mayan, 2016).

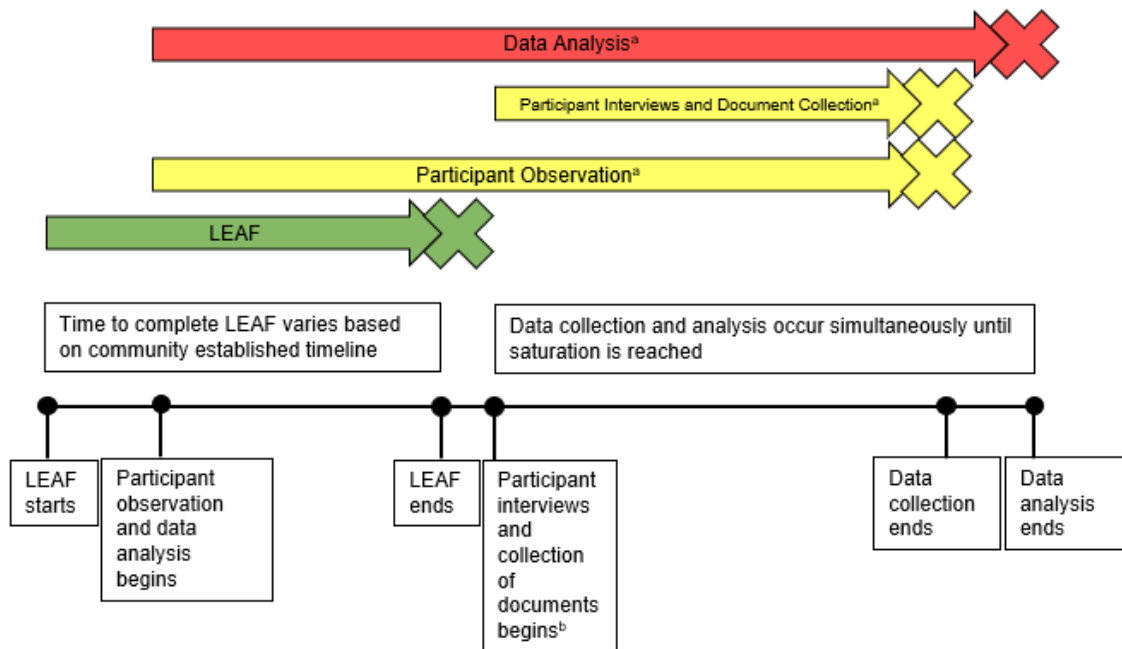
## **Collective Study Design**

I chose a collective case study design to explore how engaging communities in collecting and reporting on food environment data could potentially create action to promote healthy food environments. Chmiliar (2012) defines a case study as “a methodological approach that involves the in-depth exploration of a specific bounded system, utilizing multiple forms of data collection to systemically gather information on how the system operates or functions” (para. 1). For this research project, the bounded system, or case, was each community that had completed LEAF by February 2020. Therefore, the definition of a case was bounded by time, activity, and place. A case study design was deemed appropriate, as this research project aligned with the following criteria that Yin (2003) outlined: (a) the focus of the research is to answer “how” and “why” questions, (b) contextual conditions are believed to be relevant to the phenomenon under study, and (c) boundaries between the phenomenon and context are not clearly defined. Further, the exploratory nature and flexibility offered by the case study approach, both in time and methodological structure (Simons, 2012), fit with the research purpose. This research project was a collective case study, as each individual community (or case) was part of a broader collection of communities (or cases). The examination of multiple communities permitted me to gain a more in-depth understanding of LEAF than if only a single community was selected, as it enabled the comparison of similarities and differences between cases. Following Stake’s (1995) constructivist approach, I aimed to elucidate meaning and understanding of the phenomenon



with particular focus on context. Examining contextual similarities and differences between the communities included in this research project was essential, as critics have cited insufficient attention to context as an explanation for the lack of success of community-based initiatives (McLaren et al., 2007). See Figure 2 for a visual depiction of the research process within each community.

**Figure 2. Research Design**



<sup>a</sup>In addition to data collection and analysis of each individual case (as shown), a cross-case comparison was also completed.

<sup>b</sup> Although data collection for relevant documents began immediately after the LEAF project ended, timelines for interviews depended on each included community’s priorities.

## Qualitative Methods

This research project used qualitative methods, including semi-structured interviews, document review, and participant observation to generate data (described below). According to Mayan (2016), qualitative inquiry is an “attempt to interpret or make sense of the meaning

people attach to their experiences or underlying a particular phenomenon” (p 11). This aligned well with the research purpose, as exploring the meaning attached to stakeholders’ experiences of LEAF provided rich data. Further, qualitative methods were chosen for their ability to aid in understanding the complex and sometimes unexpected mechanisms through which interventions enact change (Moore et al., 2015).

### **Sampling**

The sample of cases and individual participants for this research project were drawn from a predetermined group. Cases included Alberta communities that had completed LEAF; individual participants included stakeholders in these communities that were involved in or had knowledge of LEAF, as they were the most likely to have the richest experiences to share. Due to time restrictions of this thesis research, the number of cases and individual participants included was limited by the number of communities that had completed LEAF by February 2020.

Convenience sampling was used within the sample to select individual participants, as the number of eligible and interested individual stakeholders in each community was limited. A total of seven LEAF communities were included in this research project. Of the 26 individuals that participated in an interview, three were involved with community A, four were involved with community B, four were involved with community C, three were involved with community D, seven were involved with community E, four were involved with community F, and six were involved with community G (some participants were involved with or had knowledge of multiple communities. Thus, the number of participants appears to be greater than 26). Purposive sampling was used to locate documents that pertained to LEAF. This meant that documents were selected intentionally, based on the amount of information they could provide (Mayan, 2016) about community-level engagement in LEAF. Documents reviewed included each community’s

final Mini-NRC. Although the sample size was initially limited by the research timeframe, it was ultimately dictated by data saturation, which Mayan (2016) defines as the state “when no new data emerge, when all leads have been followed, when negative cases have been checked, and when the theory or story is complete” (p. 63).

## **Recruitment**

Working as a graduate research assistant on LEAF enabled me to meet many of the LEAF project leads and LEAF stakeholders. Connections to LEAF project leads and LEAF stakeholders were made via teleconference at LEAF validation or recommendation meetings; in person at the community Mini-NRC launch; or, in some cases, both. Connections with the first two LEAF communities were not made until the point of recruitment, as they had completed LEAF prior to my involvement. In addition to making connections with LEAF stakeholders, these meetings provided me opportunities to engage in participant observation. At five of the included LEAF communities’ Mini-NRC launches, I provided LEAF stakeholders with information about the research project and distributed “Consent for Release of Contact Information” and “Consent for Release of Documents” forms (see Appendices B and C respectively). These forms outlined the research project’s purpose and procedures. Individuals that consented to the release of meeting minutes for research purposes signed the “Consent for Release of Documents” form. Individuals that were interested in learning more about the research project signed the “Consent for Release of Contact Information” form, thereby allowing the research team to contact them. This method of recruitment was chosen as an attempt to boost low response rates from the first two communities, which relied on a LEAF project lead forwarding consent forms to potential participants via email. However, not all stakeholders that were involved in LEAF were able to attend the community Mini-NRC launch. Thus, LEAF

project leads distributed “Consent for Participation” (Appendix D) and “Consent for Release of Document” forms to these individuals either in person or via email. Obtaining retroactive consent for documents was challenging given the high stakeholder turnover rates during LEAF. Therefore, review was only conducted on each community’s final Mini-NRC, as these had either been posted publicly or distributed widely at the Mini-NRC launch. When scheduling interviews with potential participants, the researcher answered any questions about the research project and provided a “Consent to Participate” form, which was signed by the participant and returned before the scheduled interview date. At the end of each interview, participants identified and contacted other community members that would be classified as key informants to the project.

### **Ethical Considerations**

Formal ethics approval was sought and obtained from the Research Ethics Board at the University of Alberta. Further, this research project adhered to the core principles that the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans* (TCPS2) (Canadian Institutes of Health Research et al., 2018) outlined as comprising human dignity: respect for persons, concern for welfare, and justice. General ethical procedures outlined by the TCPS2 were followed, including collecting informed, written consent of participants. Participant’s privacy and confidentiality were protected by replacing participant names with numerical identifiers and through data storage on a password protected computer accessible only to select researchers involved in the research project. However, protection of participants’ anonymity when publishing data from an in-depth interview is harder to maintain, as contextual details and identifying factors within the interviews that could reveal a participant’s identity (Richards & Schwartz, 2002). Additionally, some communities involved in this research project are quite small, and the number of people involved in LEAF was limited. The research team attempted to

mitigate the risk of participant identification through the removal of community names and through the involvement of multiple communities.

Ethical issues identified in recruitment for this research project included the possibility of undue influence. Undue influence and manipulation may arise when prospective participants are recruited by individuals in a position of authority, making consent not voluntary (Canadian Institutes of Health Research et al., 2018). Since we were reaching out to individuals who had pre-existing relationships with the research team, we wanted to make sure that they did not feel pressured into participating. One step taken to minimize this was carrying out the participant interviews after LEAF was completed, and the communities had access to their final Mini-NRCs.

### **Data Collection**

Data collection began during the LEAF process. To address both of the goals of this research project, I used semi-structured telephone interviews as the primary data collection strategy. For goal one, I used documents and participant observation as supplementary data collection strategies. The use of different data sources was chosen because of the potential to facilitate a more holistic understanding of the community-level engagement in LEAF, as it allowed examination of the phenomenon through multiple lenses (Baxter & Jack, 2008).

### ***Semi-structured Interviews***

Individual semi-structured interviews were conducted with LEAF stakeholders upon community completion of LEAF. Semi-structured interviews were deemed appropriate for this research project as they are useful when there is enough understanding about a phenomenon of interest to generate questions, but further exploration is still needed (Mayan, 2016). Further, the design of semi-structured interviews allows flexibility to explore unexpected insights, seek

clarity in interviewees' responses, and better enables the interviewees to outline their own interpretations of their experience (Bryman & Bell, 2016).

Interviews were conducted via telephone, as the research project's sample involved participants from multiple communities across Alberta. Interviews lasted an average of 39 minutes and were conducted between December 2018 and March 2020. In each included community, timelines for conducting participant interviews were dictated by community and participant needs. As outlined above, recruitment for participant interviews typically began at the LEAF community's Mini-NRC launch. However, for reasons outlined above, participant interviews in the first two included communities did not begin until roughly 10 months after they had completed LEAF. Each participant was interviewed once, with the exception of one participant that participated in an additional follow-up interview. This participant was a LEAF project lead for two communities and was selected for an extra interview because the communities were considering creating a second Mini-NRC. Further, this provided an opportunity for the researcher to follow up on LEAF use and impacts at a later stage than was possible in other communities. Topics covered by the interviews addressed both goals of the research project. Regarding the LEAF process, interviews addressed stakeholders' experiences collecting and interpreting local food environment data, as well as the process of creating community-specific recommendations for change. Regarding LEAF action, interviews addressed stakeholders' experiences using their Mini-NRCs, as well as any barriers and facilitators to future Mini-NRC use or local food environment action. Further, interviews provided LEAF stakeholders with an opportunity to report any recommendations that had been achieved, or any improvements that had been made in their local food environments (see Appendix E for the interview guide).

### ***Document Review***

I reviewed each LEAF community's final Mini-NRC (n=7). Documents were deemed an appropriate source of data for this research project, as they can be used to provide context for events that cannot be directly observed by the researcher (Stake, 1995). Furthermore, documents can aid in uncovering meaning and understanding relevant to the research problem (Merriam, 1988). Information in each community's final Mini-NRC helped guide participant interviews, as they highlighted questions that needed to be asked. For example, during participant interviews, I inquired about differences in communities' Mini-NRCs, such as the inclusion or exclusion of certain settings and indicators. I also used the Mini-NRCs to aid the process of reporting environmental impacts: having a copy of the relevant Mini-NRC available during interviews enabled participants to quickly report which recommendations had been achieved. This strategy was adopted when initial participants were unable to recall specific recommendations that were listed in their Mini-NRC. Further, each Mini-NRC provided supplementary data for investigating community-level engagement in the LEAF process (goal one). In particular, community-specific recommendations provided insight into the community context and priorities. Documents were also chosen for their ability to aid in research credibility, as they can act as a means of triangulation (using multiple data sources to seek convergence or divergence of evidence on the same phenomenon) (Bowen, 2009).

### ***Participant Observation and Field Notes***

I took observational field notes throughout my 17-month involvement with the LEAF process. This included detailed notes taken during LEAF meetings and at five community's final Mini-NRC launch. Observation was chosen for its potential to gain understanding of the LEAF process that may be inaccessible through participant interviews or documents (Mayan, 2016).

Observations were guided by the research purpose, as well as questions from LeCompete and Preissle's (2003) framework. Specifically, field notes taken during LEAF meetings or community Mini-NRC launches included important contextual information, such as the date, time, location, length of meeting, and list of stakeholder's occupation or sector of employment. Along with documenting a description of the meeting or launch, I recorded my initial thoughts and interpretations. Much like documents, observational field notes helped guide the interview process, as I was able to follow up on interesting conversations or atypical events that transpired during LEAF meetings. Furthermore, participant observation provided supplementary data to contextualize interview findings for goal one. For example, participant observation enabled me to view the group process of creating recommendations in real-time, allowing me to capture nuances in this process that were unavailable during one-on-one interviews. I also kept a personal journal that included insights and thoughts that may have arisen through discussion with the project coordinator or my supervisor which helped me to make sense of the data.

## **Data Analysis**

### ***Overview***

I analyzed all data using the constant comparison analysis strategy as outlined by Charmaz (2014). This analysis strategy was chosen because of its focus on making comparisons: a strategy that helped highlight important similarities, differences, and relationships within and between cases. I made comparisons within and between data sources and cases, grouping conceptually similar data together. The coding process was inductive and consisted of two phases: within-case analyses followed by cross-case comparisons. Within each case, data analysis consisted of two stages: a detailed initial coding followed by focused coding. Once preliminary categories were developed for each case, I conducted a cross-case comparison, examining for common patterns



or themes (Chmiliar, 2012). I engaged in spontaneous and unstructured memo-writing throughout the process of data analysis to clarify data and increase data abstraction (Charmaz, 2014). I used memo-writing, the process of writing informal notes about analysis, as a primary strategy for making comparisons both within and across communities.

### ***Data Preparation and Preliminary Analysis***

All participant interviews were audio recorded and transcribed verbatim by me. Transcription increased my familiarization of the interview data. Further, I began preliminary analysis during transcription, as I recorded initial thoughts and key points as separate memos in my research journal. Upon completion of transcription, I continued the preliminary analysis by reading the transcript, reflecting on the initial memos, and creating new memos to record further thoughts and summarize the interview. At this stage, I also began to highlight passages or quotes that seemed salient to the research purpose. Further, I began recording comments, questions, and phrases within the transcript as ideas to revisit during analysis. Although transcription was not required for documents or field notes from participant observation, I conducted a similar process of preliminary analysis (reading and recording initial thoughts) on these data sources.

### ***Initial Coding***

After preliminary analysis, I coded each community's data following Charmaz's (2014) strategy of initial coding. This was done manually through Microsoft Word, using comment boxes to label segments of data with codes. The aim of initial coding was to begin the search for analytic ideas and help guide subsequent data collection and analysis. The process of initial coding was open-ended and involved using a combination of code types, consisting mostly of in vivo and process codes. In vivo codes consisted of words or short phrases that were pulled

directly from the data itself; process codes consisted of short phrases that began with gerunds, such as identifying (Saldaña, 2016). This combination of code types helped me stick close to the data and remain action focused.

During initial coding, the segment of data coded ranged from a single word to an entire paragraph of text. This range of detail was greatly dictated by the data source: interview transcripts were coded line-by-line, field notes were coded line-by-line or incident-by-incident, and documents were more likely to have one code pertaining to an entire paragraph. At this point, all generated codes were provisional and were often changed as the data was re-read or as analysis progressed. Initial coding highlighted gaps in the data and helped guide subsequent data collection. Thus, simultaneously collecting and analyzing the data enabled me to dive deeper into the unanswered questions from earlier data sources.

### ***Focused Coding***

Following initial coding, I manually coded each community's data using Charmaz's (2014) strategy of focused coding. Similar to initial coding, I began this process using Microsoft Word. During focused coding, I re-read all data and corresponding codes, searching for codes that occurred most frequently or codes that were most significant (i.e. those that summarized the data more completely). Making comparisons between initial codes enabled me to determine those that were most significant and had the most conceptual strength for each goal. Focused coding also involved coding initial codes: I combined small groups of sequential codes into one lump code (Saldaña, 2016). After I completed a few rounds of focused coding and established preliminary focused codes, I input the data and focused codes into NVivo qualitative analysis software to better enable comparison and develop preliminary conceptual categories. According to Charmaz (2014), "categories explicate ideas, events, or processes in your data—and do so in telling

words” (p. 189). I examined the focused codes and treated those that best accounted for the data as conceptual categories. I used memo-writing throughout the category generating process to outline important category components, such as their definition, properties, conditions of occurrence, consequences, and/or relations to other categories (Charmaz, 2014).

### ***Cross-case Comparisons***

Once preliminary conceptual categories were generated, I conducted cross-case comparisons to identify common categories and themes across communities. To help facilitate this process, I input each community’s categories into Excel, which enabled me to conduct a preliminary review and comparison of categories and to begin identifying themes. After identifying the cross-case similarities and differences, I used these categories to recode all data using NVivo qualitative analysis software. Finally, I reviewed the data in the cross-case categories and themes to ensure that they accurately summarized and conceptualized each case. Although the final themes applied to all communities, some categories and subcategories encompassed by these themes carried more weight in select communities or applied to many but not all communities. These details were retained and reflected in the results, as I attempted to portray the similarities, differences, and important contextual factors that influenced the LEAF process and impacts.

### **Trustworthiness**

This research project adhered to the criteria outlined by Guba and Lincoln (1985) as its guide: trustworthiness replaced the term rigour and was thought of as the worth of the research project’s findings. Trustworthiness is demonstrated through four components: credibility, transferability, dependability, and confirmability. Credibility refers to the extent that the findings are an accurate representation of the data. The research team established and maintained

credibility through numerous means. First, there was prolonged engagement between the research team and the study population. I worked as a graduate research assistant on the project for roughly two years. Furthermore, I regularly consulted with the LEAF principal investigator and project coordinator, who were involved with both LEAF and this research project from the beginning. I also engaged in member checking during the participant interviews. In most cases, this consisted of summarizing the participant's response and immediately repeating it back to check for understanding. In one case, I contacted a participant after the interview to query apparently conflicting information that they had provided. Lastly, I used multiple sources of data for each case, which allowed for the triangulation of findings.

Transferability refers to the applicability of the findings to other settings. I attempted to achieve transferability in this research project by including seven diverse communities in the sample (described above). Further, transferability was established by creating a thick description of the research process so that readers can apply findings appropriately.

Dependability refers to having consistent and repeatable findings. I established dependability through the creation of a detailed audit trail outlining the rationale for steps taken and decisions made when carrying out the research process.

Confirmability refers to whether the findings were logical and shaped by the data. I established confirmability by keeping an audit trail and a reflexive journal. In this journal, I regularly noted and analyzed how my personal values could affect data collection and analysis.

### **Other Verification Strategies**

Additional verification steps outlined by Morse et al. (2002) were taken. Researcher responsiveness was demonstrated by displaying sensitivity to each community's needs and adapting the research protocol when necessary. For example, during the early phases of data

collection and analysis, I adapted the interview guide to further explore categories that were underdeveloped. During proposal development, I demonstrated methodological coherence through the use of Morse's (1999) armchair walkthrough to confirm the compatibility of the research (e.g. ontology, epistemology, theoretical perspective, etc.). The armchair walkthrough has been described as a process of thinking through one's research project, which includes asking questions such as "if I ask *this* question, then I will need this or that kind of data" (Morse, 1999, p. 435). Methodological coherence was demonstrated during the research project through a meeting with the research committee and regular meetings with the thesis supervisor. Appropriate and adequate sampling was demonstrated by only including participants that were involved in or had knowledge of LEAF. Finally, thinking theoretically was demonstrated by the avoidance of drawing definitive conclusions at the very early stages of data collection or analysis.

### **Summary of Methods**

This research project used a qualitative collective case study design to explore how engaging communities in collecting and reporting on food environment data could potentially create action to promote healthy food environments. The primary data collection strategy was semi-structured interviews with a sample of 26 LEAF stakeholders. I used each community's Mini-NRC and participant observation of the LEAF process as supplementary data collection strategies for goal one. Data collection and analysis were iterative, following Charmaz's (2014) constant comparative analysis strategy. Data analysis was inductive and consisted of two phases: within-case analyses followed by cross-case comparisons. Within each case, data analysis consisted of two stages: a detailed initial coding followed by focused coding. Next, I conducted cross-case comparisons, examining for common patterns or themes (Chmiliar, 2012). I used

memo-writing as a primary strategy for making comparisons both within and across communities.

## **Chapter 4: LEAF Process: Results**

This chapter outlines results pertaining to the LEAF process, including results from 26 LEAF stakeholder interviews, each included community's Mini-NRC, and participant observation conducted during the LEAF process of five included communities. A descriptive summary of the LEAF process is provided. Further, analysis revealed two main themes, each with several categories and subcategories. Figure 3 provides a broad overview of the themes and categories, as well as their interconnections. Tables 4 and 5 provide an overview of the categories, subcategories, exemplar quotes, and interconnections (Table 5 only) for each theme.

### **Descriptive Summary of the LEAF Process**

The LEAF research team intended the LEAF process to be flexible and adaptable to each community's needs. LEAF timelines were dictated by the community, and completion rates varied from 8 to 20 months. While each community followed the general LEAF process (see Figure 1 in chapter 2), there were numerous differences among communities, as steps were added and removed when needed. Differences in the LEAF process reflected the diversity of LEAF communities, with contextual factors, such as community size, playing an influential role. Timing of data collection also varied according to community capacity. Seasonal collection may have reduced access to closed facilities, such as arenas, or may have expedited collection prior to summer school closures. Furthermore, differences in the LEAF process reflected the different levels of community support for LEAF or differences in the structure of the groups leading LEAF.

Each LEAF community was responsible for selecting the settings and indicators included in their Mini-NRC. The LEAF research team did not put limits on the number of indicators or settings selected. While there are some similarities between communities, such as the number of

selected indicators or the inclusion of data from schools, there were vast differences in the inclusion of specific indicators and settings. See Tables 2 and 3 for a breakdown of the indicators included by LEAF communities. On average, communities included the most indicators and created the most recommendations for the physical environment. Communities' Mini-NRCs also focused heavily on practice recommendations. The presentation of data also varied across communities, with school data providing an interesting example. While two communities listed their schools by name, the remaining five communities presented school data anonymously. Anonymization was done in two ways: in the larger communities, schools were grouped by type (e.g. elementary, junior, and senior high schools); in the smaller communities, the school names were replaced with labels of "school A, B, C, etc." Each community was also responsible for determining how they wanted to share their Mini-NRC. Approaches to dissemination varied widely. Only the two largest communities posted their Mini-NRCs on the internet, making them available for anyone to see. Some smaller communities took a more conservative approach to sharing the Mini-NRC, such as sharing the full Mini-NRC when asked or only sharing the infographic.



**Table 2. Indicators Included in the 2018 Alberta NRC and in LEAF Communities' Mini-NRCs**

Environment	Indicator	2018 Alberta NRC	Community A	Community B	Community C	Community D	Community E	Community F	Community G
Physical	1. High availability of healthy food in schools								
	2. High availability of healthy food in childcare settings								
	3. High availability of healthy food in community settings: Recreation Facilities								
	4. High availability of healthy food vendors								
	5. Limited availability of unhealthy food vendors								
	6. Foods contain healthful ingredients								
Communication	7. Menu labelling is present								
	8. Shelf labelling is present								
	9. Product labelling is present								
	10. Product labelling is regulated								
	11. Government-sanctioned public health campaigns encourage children to consume healthy foods								
	12. Restrictions on marketing unhealthy food to children								
	13. Nutrition education provided to children in schools								
	14. Food skills education provided to children in schools								
	15. Nutrition education and training provided to teachers								
	16. Nutrition education and training provided to childcare workers								
Economic	17. Lower prices for healthy food								
	18. Higher prices for unhealthy food								
	19. Affordable prices for healthy foods in rural, remote, or northern areas								
	20. Incentives exist for industry production and sales of healthy foods								
	21. Reduce household food insecurity								
	22. Reduce households with children who rely on charity for food								

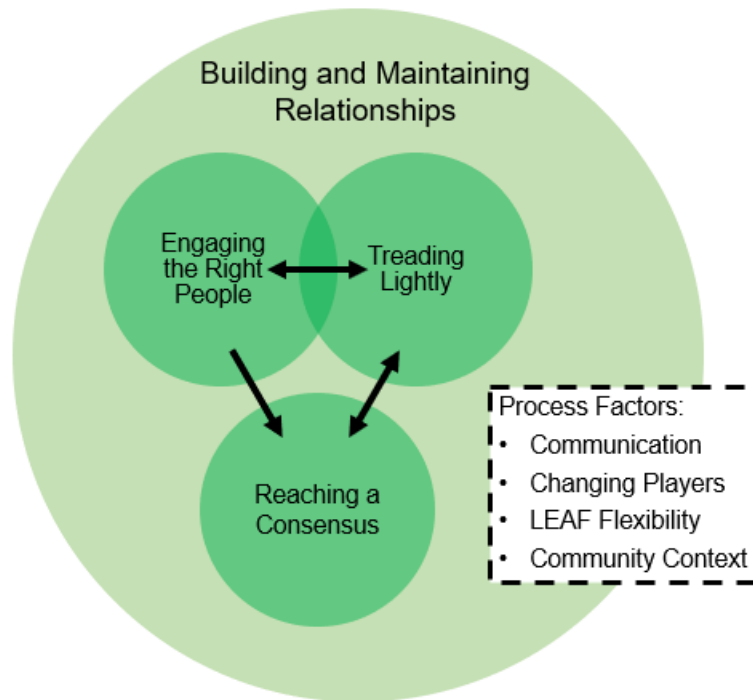
Environment	Indicator	2018 Alberta NRC	Community A	Community B	Community C	Community D	Community E	Community F	Community G
Environment	23. Nutritious Food Basket is affordable								
	24. Subsidized fruit and vegetable program in schools								
Social	25. Weight bias is avoided								
	26. Corporations have strong nutrition-related commitments and actions								
	27. Breastfeeding is supported in public buildings								
	28. Breastfeeding is supported in hospitals								
Political	29. Healthy eating and obesity prevention strategy/action plan exists and includes eating behaviours and body weight targets								
	30. Health-in-All policies								
	31. Childhood health promotion activities adequately funded								
	32. Compliance monitoring of policies and actions to improve children's eating behaviours and body weights								
	33. Children's eating behaviours and body weights are regularly assessed								
	34. Resources are available								
	35. Food rating system and dietary guidelines for foods served to children exist								
	36. Support to assist the public and private sectors to comply with nutrition policies								

Note. Coloured boxes highlight the indicators that were included in each NRC; grey boxes highlight the indicators that were not included in each NRC. Colour coding aligns with the presentation of data in the Mini-NRCs; each environment had a unique colour.

**Table 3. Overview of Total Indicators Chosen per LEAF Community**

Environment	Total Indicators Chosen							
	Community A	Community B	Community C	Community D	Community E	Community F	Community G	Average per community
Physical	4	4	5	5	6	5	6	5.00
Communication	4	2	5	4	3	4	5	3.86
Economic	2	2	3	2	3	2	3	2.43
Social	1	1	3	3	3	2	1	2.00
Political	4	4	5	2	5	2	5	3.86
Total indicators chosen	15	13	21	16	20	15	20	

**Figure 3. Holistic Overview of Main Themes and Categories**



Analysis of the data revealed two major themes: (i) *building and maintaining relationships* and (ii) *process factors*.

### **Building and Maintaining Relationships**

Participants perceived positive community relationships as facilitating the LEAF process and as a vital component for LEAF success. Communities integrated relationship-building strategies into the LEAF process while attempting to create a Mini-NRC that was an accurate reflection of their community. Building and maintaining relationships consisted of three categories that represented strategies used by LEAF communities during the development of their Mini-NRC, including *engaging the right people*, *treading lightly*, and *reaching a consensus*. These categories were not mutually exclusive but were interconnected and influenced one another. Further, although they were present in each community, the extent to which these strategies were used differed among LEAF communities.

### *Treading Lightly*

Participants often described needing to tread lightly or proceed carefully during the LEAF process. For some, this was a result of perceiving nutrition and nutrition-related action as a sensitive topic of conversation. As explained by one participant, nutrition can involve culture and values:

I don't know if it's this town specifically or just rural in general, but there is just such a culture around, you know, 'we're going to the rink, and we're having our rink food.' And that can be a barrier because, again, people get a little defensive about like, 'well, that's our way of life.' And, in going through this process, you know, there's a lot of beef farmers in the area, and I know some people were personally offended by the fact that the guidelines don't promote the overconsumption of red meat. So, you know, treading carefully and not making people feel uncomfortable or that their way of life is threatened. I think it's really important out here for maintaining those relationships (P5).

Other participants worried about community stakeholders being insulted or threatened by the results of their Mini-NRC. When asked if they had concerns publicly sharing their Mini-NRC, one LEAF project lead replied,

No, I don't have concerns about it at all. I think it's very fair. It's a true look at what is there. I just want to be a bit sensitive to those that are providing the food, like the cafeteria. You know, it is a business—she does run a business there. And she has made changes, and I don't want to necessarily bring any sort of insult to anyone, right. So sometimes you have to walk about these things a bit more sensitively than not (P18).

By treading lightly, participants hoped to mitigate the potential negative impacts of LEAF. Namely, they hoped to minimize misinterpretations of their Mini-NRC and the defensiveness felt by community stakeholders. As explained by one LEAF project lead,

Another thing that came into play when we were deciding which recommendations (to include) was—I guess like politics and kind of wanting to maintain relationships. And not everybody wants all of those things to be public or like right on the infographic. So, trying to respect that certain people might not want to be kind of called out (P10).

Communities demonstrated treading lightly through various strategies, including *using sensitive language*, *respecting what exists*, and *obtaining permission and incorporating requests*.

**Using Sensitive Language.** When developing their Mini-NRCs, LEAF communities attempted to use language that was sensitive to the community context. Some participants perceived the use of sensitive language as an important component of building and maintaining community relationships. As explained by one participant,

I think often times when I'm working with schools, and we're trying to support healthy eating, I always feel like I have to be really careful and sensitive with the language that I use and really just try to be—look at what they're doing and praise them for the positive, but then just sort of sneak in some suggestions just to improve it (P13).

The difference between language that was deemed sensitive and insensitive was often minor and community-specific. In one case, the difference came down to a single word that was used in the Mini-NRC. For some, using sensitive language meant including contextual information, such as explanations why the benchmark was met or unmet:

When we had spoken with the rec centre, they were upset 'cause they got a poor score, but it was only the vending machines that were included—because there was like a

miscommunication about which food sources were to be included. And so, then the rec center was like, ‘can you please clarify that it’s only the vending machines.’ And then the vending machine contractor was like, ‘why are you calling me out?’ And it was not intentional. But that meant that one sentence was really important, so we ended up getting it changed...she had requested that sentence be changed, and then that made her happy (P10).

The use of sensitive language is best demonstrated by examining the terminology used in the recommendations of each community’s final Mini-NRC. Often, recommendations were framed in supportive terms and demonstrated the need for community partnerships. For example, one community recommended that “AHS School Health & Wellness Promotion Facilitators and Public Health Dietitians promote and support schools and parent councils to provide healthier options for fundraising, hot lunches and school events” to increase the availability of healthy food in school settings (indicator 1). In one community, the impact of failing to use sensitive language was demonstrated during the LEAF validation process. Here, the failure of the LEAF research team to use language that was sensitive to the community context resulted in what the LEAF project lead described as “hard feelings (in LEAF stakeholders) about the way that things were worded” (P5).

**Respecting What Exists.** Respecting what exists means recognizing, including, and building off of community strengths. This was a strategy for increasing the utility of each community’s Mini-NRC and for building and maintaining relationships in the community. Respecting what exists is reflected in each community’s final Mini-NRC, as community strengths are embedded within the “key findings,” “local assets,” or “on the horizon” sections. The “local assets” and “on the horizon” sections provide LEAF stakeholders with an opportunity

to highlight existing or upcoming programs that would not otherwise be included in their Mini-NRC. LEAF stakeholders discussed and debated how their Mini-NRC should respect what exists at the recommendation meetings. The potential impact of failing to respect what exists was demonstrated in the response of one participant, who dismissed the utility of a recommendation:

For example, <school name> had received funding from the previous provincial government. They were chosen as the school in their district and were able to offer breakfast every morning for the school. And then once the provincial government had changed, that funding was lost, and they are no longer able to do that. So featuring them and showcasing them—applauding them—as doing better than another school, when it was simply because they received funds (that) the other school didn't receive, didn't really serve any purpose. Also, it was no longer pertinent, as that funding ended, and they couldn't do it any longer. As opposed to focusing on the existing... snack program, breakfast club, that operates in the community and... how that benefits all the children. And perhaps looking at how that can be enhanced, I think. (P17)

At times, respecting what exists conflicted with obtaining permission and incorporating requests, which was a different strategy that communities used to tread lightly (discussed below). The conflict between these two subcategories was demonstrated most clearly when community stakeholders requested that school data be anonymized. The perceived pros and cons of abiding by this request were discussed at LEAF meetings. Although LEAF stakeholders wanted to respect schools' wishes, they also wanted to respect what exists by highlighting the schools that were meeting the benchmarks. As one LEAF project lead explained,

And so, we did have quite a bit of discussion about, 'okay, should we just combine all the data? But then what are we losing?' Because obviously, the schools can't take individual



action if they don't know what's going on in the specific schools. But then also, you know, you don't want to ruin relationships and create bad—you know, break those relationships that you do have with the schools. So, it was a big challenge for us (P5).

Ultimately, communities chose to incorporate the requests of community stakeholders: if asked, they anonymized the school data in the report and planned to directly share individual school data back to participating schools.

**Obtaining Permission and Incorporating Requests.** LEAF stakeholders obtained permission from setting stakeholders at various stages of the LEAF process, including data collection and results sharing. Although communities generally viewed obtaining permission for data collection in schools and childcares as essential, their views on obtaining permission for data collection from publicly accessible settings (e.g. recreation facilities) varied. Many LEAF stakeholders still sought out permission or consent from public settings as a way of maintaining relationships. Here, the influence of community size provides an interesting example. While several participants perceived the LEAF process to be more manageable in a small community, as there were fewer stakeholders to coordinate and fewer locations to collect data, fewer included locations also created less possibility for setting anonymity. This may have influenced LEAF stakeholders felt need to gain permission from public settings. For example, gaining the consent of restaurants may have been perceived as more important:

There are very few restaurants in that community. So, just wanting them to understand how the data would be used, so that they didn't feel that there'd be comparisons among different establishments, or that the data would be used in a way that could be perceived sort of negatively on them (P20).

Furthermore, for some participants, the felt need to obtain consent was tied to the method of data collection (i.e. taking pictures) and the presence of staff during data collection. As explained by one participant,

P7: the direction to us was, ‘it’s a public facility, so you can take pictures of whatever you want.’ Which is fine, but that doesn’t really help with relationship building. If you’re... so, for example, like in <location>, taking pictures of like the candy area, you know, staff may have felt that we were taking the photos for a negative purpose rather than just the overall... the overall purpose of it.

I: Yeah. So that’s one of the other questions. Did you have any fears of infringing on people’s privacy?

P7: Yes. Yes. So, for—specifically for those areas where there were staff present. You know, like taking pictures of vending machines is no big deal, there’s nobody around. But, you know, you’re going into people’s workplaces and taking pictures of things without really necessarily discussing it...like if I was sitting in my office and someone came in and started taking pictures around my area, I would wonder what the heck is going on.

LEAF project leads often incorporated requests from community stakeholders and settings included in their Mini-NRC. While dissemination approaches varied, obtaining permission and incorporating requests played a role during the decision-making process for dissemination in most communities. For example, some communities shared their Mini-NRC with setting stakeholders before it was finalized, providing them with a chance to submit feedback and request edits if desired. This step helped enable some communities to widely disseminate their Mini-NRC, as they took comfort in knowing that setting stakeholders wouldn’t

be surprised by its results. However, this was not the case when setting permission was not perceived to be genuine. As described by one LEAF project lead,

I just don't know. Especially with some of the concerns the schools had... I mean our solution to that was to take out the names of the schools. And they said, 'fine,' like, 'that's okay.' But it just—because it never really felt, I guess, like they were 'okay' with that... yeah, I'm just not sure if posting it like on our town website, for example, like if that would...bring up some concerns with others (P5).

Others described a strategic purpose for obtaining permission, as they perceived the process of obtaining consent as gaining commitment for food environment action. As stated by one LEAF project lead, “well, if you don't get consent, then I don't think they're interested in participating and making changes. So, then what's the point (of collecting data in these settings)?” (P16). Thus, some participants viewed obtaining permission and incorporating requests as a strategy to achieve engaging the right people.

### ***Engaging the Right People***

Engaging the right people represents the strategic engagement of community stakeholders to facilitate the LEAF process and build or maintain relationships. Participants described two main strategies used to engage the right people: *utilizing connections* and *offering different ways to participate*.

Community stakeholders that participated in LEAF reported several factors that determined their participation. Many stated that they were passionate about healthy eating and that LEAF fit within their professional role; for some, LEAF even became part of their job. In each community, engagement in the LEAF process was diverse and multi-sectoral. For example, communities had representation from schools, recreation facilities, childcare centres, the city,

public health, etc. Although the exact makeup of LEAF groups varied among LEAF communities, participants typically described wanting engagement in the LEAF process from “insiders,” “decision-makers,” and “interested others.” Insiders and decision-makers are individuals that live and work within the community, often within target settings. However, decision-makers are insiders that are in roles with more authority, such as city councillors or school administration. Interested others encompasses individuals that do not work within target settings but have a vested interest in improving children’s food environments. Engagement from each of these groups was generally seen as strengthening the LEAF process. For example, engaging insiders and decision-makers helped contribute to creating feasible recommendations. As stated by one participant, without engagement from insiders, the process of creating recommendations was “a little bit more (like) guessing to make it fit” (P2). Furthermore, engaging decision-makers in the LEAF process was viewed as important for LEAF success. Participants often believed that commitment to the LEAF process was an important indicator of commitment to food environment action. As explained by one participant,

So, I think where we’ve seen that more diverse data collection, I think you’re ultimately going to get more buy-in. 'Cause it shows more buy-in right from the get-go—if everybody’s willing to put their time in and it’s not just the dietitian time doing it (P14).

Community engagement in LEAF also seemed to strengthen the process of relationship building. For example, LEAF meetings provided a venue for building new community relationships. As explained by one LEAF stakeholder,

And then the people that were in the room really helped... like sort of spark some of those recommendations because in say, for example, the one about the high availability of healthy food, talking about the <organization>, people were there from those

organizations. So, it kind of makes you think like, ‘oh yeah, why couldn’t we partner with them to talk a little bit more about this?’... So, I think having the right people involved is important (P15).

Although the benefits to the LEAF process and relationship building were clear, engaging the right people was often challenging. LEAF stakeholders worked hard to achieve participation from all desired groups but often struggled to engage decision-makers in the LEAF process. When this was the case, some LEAF project leads felt that engaging insiders would be beneficial, as insiders might be able to utilize their connections and gain commitment for action.

**Utilizing Connections.** Engaging the right people in the LEAF process was made easier when LEAF project leads utilized their pre-existing connections and relationships. All of the LEAF project leads had positive pre-existing relationships within the community as a result of their past work experience. After LEAF project leads engaged their connections, further engagement was made possible through the connections possessed by the newly engaged stakeholders. This process helped to facilitate the LEAF process and relationship building, including helping to identify and engage other relevant groups that may have been missed or were hard to engage. As explained by one participant,

So, I was contacted (by the LEAF project leads) to try to find childcare centres that would be willing to participate in the project. And we did have <name of LEAF project lead> come to one of our meetings to tell everybody about it—the childcare directors all about it. And I believe I also reached out to some centres directly to try to see if we could get a few more to participate (P15).

**Offering Different Ways to Participate.** In an attempt to facilitate engaging the right people, LEAF project leads offered different ways to participate in the LEAF process. Different

ways of participating consisted of different forms of participation (i.e. direct or indirect) and levels of participation (i.e. participating in different LEAF stages). Community stakeholders that directly participated were those that attended LEAF meetings; community stakeholders that indirectly participated were those that provided feedback through email or separate consultations. By allowing community stakeholders to participate in different ways, community stakeholders could tailor their engagement to fit their busy schedules. This was beneficial, as full, direct engagement in the LEAF process was not always feasible for community stakeholders. As explained by one LEAF project lead, “I don’t think people would have done it (LEAF) if we hadn’t collected the data ourselves. I just don’t think it would have ever gotten done” (P16).

### ***Reaching a Consensus***

Participants perceived the process of creating the Mini-NRC as an informal process that consisted of discussion and reaching a consensus. During these discussions, LEAF stakeholders built relationships with each other, as they shared their perspectives and worked together to create recommendations. As described by one LEAF project lead,

I think we just really just talked it out and provided different perspectives. And... it was nice to have the different perspectives around the table because sometimes you may think like, ‘no that’s not possible,’ and then it’s like, ‘well actually, you know, we have this group that maybe you haven’t heard of, that are working towards this.’ So, being able to all kind of bring those different perspectives and like abilities based on where we exist in the community (P5).

In each community, a consensus was reached by *integrating local knowledge* and *integrating outside knowledge*. Although the process was informal, communities stressed the importance of creating recommendations that would be perceived as feasible by other community stakeholders.

One perceived limitation of the informality of LEAF process was that it did not always generate a strong commitment to action. As expressed by one participant, the process of creating recommendations was “more like idea sharing and not like committing to do anything” (P7).

**Integrating Local Knowledge.** Local knowledge broadly refers to knowledge about the community, such as readiness of setting stakeholders, upcoming changes within settings or the community, and available human and financial resources. LEAF stakeholders integrated local knowledge to create feasible recommendations and build or maintain relationships. Integrating local knowledge resulted from involving residents that lived in each community, as well as obtaining diverse representation from multiple settings (e.g. schools, local government, childcare associations, etc.). Local knowledge was integrated during all LEAF stages but was most apparent during the selection of indicators and settings and during the process of creating recommendations. As such, these stages will be explored in further detail.

LEAF stakeholders used their knowledge about the community to choose the most relevant settings and indicators. In some cases, the integration of local knowledge led to the inclusion of settings that may not have been of obvious importance to an outsider:

I went and took a couple photos over at the hospital... so the idea is that the children across the way at the one school... could and do run over and utilize the vending there and, you know, typically chocolate bars, right, so that was the rationale (P2).

Although there are some commonalities in indicator selection across communities (for example, the indicator “high availability of healthy food in school settings” was included for all communities in the sample), there are also many differences (see Table 2). This diversity of indicator selection may reflect differences in community-relevant factors that may not be immediately obvious to an outsider. Evidence of this can be found by comparing indicators

included in the 2018 Alberta NRC, which focused on municipalities' role in food environment action, to those chosen by LEAF communities. Notably, the indicator "higher prices for unhealthy food" (benchmark: a minimum excise tax of \$0.05/100mL is applied to sugar-sweetened beverages sold in any form) was included in the 2018 Alberta NRC but was not selected by any of the LEAF communities in the sample. Further, the indicator "weight bias is avoided" (benchmark: weight bias is explicitly addressed in schools and childcare) was not included in the 2018 Alberta NRC but was selected by all LEAF communities in the sample.

The integration of local knowledge was most prominent during the stage of creating recommendations. While participants often stressed the fact that recommendations needed to be "feasible" and "achievable," they had a difficult time articulating *how* they determined what was feasible and achievable. When participants did express how they determined what was feasible, they often commented on the importance of their knowledge about community settings, including setting stakeholders:

I feel like... we tried to be real and make things that are doable, as well as consider where our other stakeholders in the community are at and how they might perceive it... And also knowing what's down the pipes for schools—knowing that they're getting the school nutrition program, those kinds of things...thinking about where we can affect people, and maybe the most number of people are also going to—I call it going to light. So, are there people that are going to want to take this on? And can this be a success? Or is this something that we kind of work at over time and hopefully end up with a new norm, right? (P2)

Again, comparison to the 2018 Alberta NRC demonstrates the importance of local knowledge in creating recommendations that are perceived as relevant or actionable. For example, for the



indicators “availability of healthy food vendors” and “limited availability of unhealthy food vendors” the 2018 Alberta NRC recommends that municipalities change zoning policies. However, the majority of LEAF communities that chose these indicators did not include changes to zoning policy in their recommendations. Several participants commented that this exclusion was the result of integrating local knowledge:

But, one of the examples that always came up is, ‘<LEAF community>’s really long and skinny. And everything is located in one area.’ So, you know, the schools are all located next to each other and they’re all located (close) to the downtown. So, in terms of like whether unhealthy food is within so many meters, right, like it’s... right now, not something that they can do much about (P5).

**Integrating Outside Knowledge.** LEAF communities integrated outside knowledge, including provincial knowledge and other community knowledge, during the LEAF process. Provincial knowledge represents the broad contextual knowledge about the current and future state of the province’s food environments. The LEAF research team guided communities through the LEAF process, which included attending meetings to answer questions and offering provincial recommendations as suggestions. As described by one participant,

We (LEAF stakeholders) sat together and went through what we thought would be a recommendation or where we were moving towards. And then back at the U of A, they could insert those, and/or augment them with other ideas they had, or things that are going on provincially that they’re aware of (P2).

Other community knowledge represents any knowledge that was derived from interactions with another community (both LEAF and non-LEAF). Participants described integrating outside community knowledge during the LEAF process:

We also took a look at <name of two LEAF communities> (Mini-NRCs). And I did talk with some other public health dietitians and the university. To say, ‘what’s doable? What have you found that’s easy to do? What have you found that’s like low hanging fruit—that’s a win’ (P16).

However, the influence of outside knowledge varied widely across communities. In part, this may reflect differences in the opportunities for integrating knowledge from other communities. For example, some LEAF project leads worked in multiple communities (both LEAF and non-LEAF), whereas others only worked in one community. Further, due to timing of participation, communities that participated in LEAF at the start of the project had fewer opportunities to learn from other LEAF communities. Finally, LEAF communities were more likely to communicate with other LEAF communities that were within their same zone (location of community).

However, many participants reported a desire to learn from other communities’ experiences with the LEAF process and related food environment action. As explained by one participant,

We didn’t really have a template to follow other than the provincial one. Like knowing that others did this and found this helpful or, ‘we did this and this works—don’t forget to ask them and get them on board’ or ‘this is how we did it.’ Those stories that I think are so helpful (P2).

## **Interconnections**

Although categories were presented separately, there were significant interconnections between them (as shown in Figure 3). This section will briefly discuss how the categories interacted and influenced each other and the overall theme of building and maintaining relationships.

### ***Engaging the Right People and Treading Lightly***

The relationship between engaging the right people and treading lightly was bidirectional: each category influenced the other. Differences in LEAF communities' definitions of and ability to achieve engaging the right people resulted in diverse LEAF groups. Resulting differences in LEAF stakeholders, such as personalities and professional roles, affected the felt need to tread lightly. Further, achieving engagement from the right people could potentially help achieve treading lightly. For example, one decision-maker commented on how her engagement in the process minimized her felt defensiveness:

I: And was being included in the process, so collecting the data and creating recommendations, important to you?

P21: It was, actually. It really was. And to be part of the process is, I think, really important. Because... I think if someone had come in and done it—I do think, you know, that's helpful, and they're professionals and they probably (know) more of what they're doing. But I think then you become a little more umm—resentful is not the right word—but it's like, you know, being told by someone else outside, 'Oh okay, yes. One more thing you expect us to do at schools.'

LEAF stakeholders felt need to tread lightly affected engaging the right people because it impacted who was classified as “the right people.” This is best exemplified by the subcategory obtaining permission and incorporating requests, which represents the overlapping section between engaging the right people and treading lightly in Figure 3. Commonly, LEAF communities would engage owners or managers of public settings (e.g. recreation facilities) during data collection to minimize their defensiveness. Thus, the felt need to tread lightly impacted who LEAF stakeholders engaged.

### ***Engaging the Right People and Reaching a Consensus***

Differences in engaging the right people, including differences in LEAF stakeholder's personality, professional roles, or general community knowledge, impacted the process of reaching a consensus. Namely, it impacted the direction of the LEAF process and the local knowledge that was integrated. This was particularly prevalent during the recommendation stage. When asked how their community determined which types of recommendations (i.e. practice, policy, or research) to use, one participant highlighted the role of engaging the right people:

I think... it really fell on who was able to come up with some recommendations. So, you know, some of the recommendations that I suggested (practice recommendations)—because I work more from an evidence-informed practice—like that was kind of where some of those came from (P5).

### ***Reaching a Consensus and Treading Lightly***

The relationship between reaching a consensus and treading lightly was bidirectional. In each community, the felt need to tread lightly impacted the consensus that the group reached at all stages of the LEAF process. This was most prominent when LEAF communities were deciding how to disseminate their Mini-NRCs. For example, when LEAF stakeholders perceived information in the Mini-NRC as “sensitive,” they were more likely to limit widespread dissemination. As explained by one LEAF project lead,

P16: So, we did discuss that (sharing the Mini-NRC publicly) at the last meeting, and we decided that we would make the infographic—if people wanted to share the infographic, then we could share the infographic. And we could share the infographic with the media but not the report.

I: Okay. And why did you decide that?

P: 'Cause we just felt the report had a lot of very sensitive information in it. But the infographic was just a little bit more, you know, general with the overriding pieces that we're doing well and then recommendations for things that we could do different.

Further, the process of reaching a consensus, particularly integrating local knowledge, helped LEAF stakeholders achieve treading lightly. As mentioned above, the difference between sensitive and insensitive language was often subtle and not always distinguishable to outsiders, such as the LEAF research team.

### **Process Factors**

Participants identified a number of factors that influenced the LEAF process and relationship building, including *community context* (described in Chapter 3), *LEAF flexibility*, *changing players*, and *communication*. The extent to which these factors were influential varied among LEAF communities.

### ***LEAF Flexibility***

In general, participants viewed flexibility in the LEAF process as a strength. They appreciated the flexibility of data collection methods, particularly the ability to submit pictures as data. Submitting pictures reduced participants' workload and enabled the engagement of individuals without extensive nutrition knowledge. As explained by one LEAF project lead,

And also, the fact that people could take pictures. Because I think sometimes the answer was sometimes like, 'I don't know—I don't know if this means that the healthy—like are healthy choices priced less than the more expensive if I'm looking at a whole menu' (P5).

Participants had conflicting views about the flexibility in LEAF steps and timelines. For some, flexible timelines were important for community engagement in the LEAF process, as

engaging community stakeholders was time consuming. More importantly, flexible timelines enabled community stakeholders to participate in the LEAF process while also balancing their regular commitments and responsibilities. However, in one community, aspects of data in the final report were perceived as outdated due to the long project timeline. As explained by one participant,

I think the challenge I saw with the process was, because it was over a period of time, by the time it came to analyzing the data, some of it was already outdated. You know, for example, current situations that were in schools when the data had been collected, then through government changes, funding changes, grant changes, it wasn't necessarily reflective of what was currently happening, which was a challenge (P17).

Participants' views also differed on the flexibility on the amount of data for collection. The LEAF research team did not set limits on the number of locations required per setting. For example, not all schools in the community were required to participate. Furthermore, the amount of data needed per setting was left flexible: if participants could not provide the answers to all the questions, they were omitted. For at least one LEAF project lead, the process flexibility meant a more manageable project:

It was made clear that we could pick and choose what we wanted to do. If you don't have answers to all the questions, obviously you can't input that, and that's okay. And...yeah, it was nice that it was flexible because it could look very overwhelming and like, 'oh gosh, we have all of this to do' (P2).

However, another LEAF project lead expressed that the LEAF process flexibility created concerns with data accuracy:

So, I guess in interpreting the data, my challenge with that is that when we talked about collecting, and we decided all of the environments that we were going to collect from, our understanding was that the U of A... they didn't have a set expectation about how much data we had to get from each of the environments to satisfy an indicator. They wanted to keep it flexible. And I think that just means that in our interpretation of the data...when I looked at the data that we'd been able to get... some of it I had less confidence in than others (P11).

### ***Changing Players***

Changing players refers to a lack of consistency among individuals involved in the LEAF process. This was a perceived barrier for several communities. Generally, turnover within the LEAF community group had one of two negative effects: *disrupting continuity* and *creating confusion*.

**Disrupting Continuity.** At times, turnover within groups developing the Mini-NRCs disrupted the continuity of the LEAF process. For example, changing players during the recommendation stage meant that groups had to spend time re-hashing what had previously been discussed. In some cases, changing players also meant a lack of continuity in the directions taken within the Mini-NRC, as new players may express differing views. As explained by one LEAF project lead,

Yeah, so they would, you know, a person would attend, and then they wouldn't attend two meetings, and they show up to the fourth meeting and it's like, 'Oh well I don't want to do this.' Like, 'Why did you guys do this?' And we've all discussed it at the first two meetings, and they weren't involved (P16).

The extent and impact of changing players varied among communities, which was in part due to the differing approaches to community engagement. For example, the disruption to report continuity was felt most acutely in a community that did not have a pre-existing coalition leading the project. Some communities that utilized pre-existing wellness coalitions to lead the project did not feel the impact of changing players. In fact, one community cited group continuity as a facilitator for the LEAF process:

I think continuity too, like people stuck around. It wasn't (that) they just kind of did a little piece of the volunteer and, you know, maybe I'd see them in a meeting here or there. We consistently would meet, or we would have teleconferences. Both these groups, in both communities, generally have a monthly meeting. And so we just called it BFE, so Benchmarking Food Environments, was always a standing agenda item, so we could say where we were at, who was doing what (P2).

**Creating Confusion.** Some participants that joined LEAF after the initial orientation felt increased levels of confusion regarding the purpose or process of LEAF. For example, one participant stated that “when this project first started, I didn't quite know what was going on. So, I didn't know what I was collecting the data for in the beginning” (P4). One misconception about the LEAF process involved the roles and responsibilities in creating recommendations. Namely, some participants that joined midway through the LEAF process expressed the belief that the LEAF research team (at the university) was responsible for creating the recommendations. Confusion about the purpose of LEAF was often minor and resolved during the process. However, confusion had a more substantial impact on one participant that adopted the role of a LEAF project lead midway through the process. In this case, the participant felt that some steps



taken by the group were the result of “assumptions” of how the LEAF process worked rather than autonomous decisions taken by the group.

Participants commented on the role that communication played in determining the effect of changing players. They perceived miscommunication and effective communication as aggravating and mitigating the negative impacts of changing players respectively. For example, one participant described communication between school stakeholders as mitigating the impact of changing players in their setting:

When they first started (LEAF), I had one of my vice principals that was more involved. So, he attended the first couple meetings and kind of got stuff going there. Then he would come back, and we would discuss recommendations...but I wasn't really involved as far as talking with the wellness group until this year. 'Cause my former VP moved on to a different school, so I kind of took over that role here. Essentially, I know all about it, but I only went to the one meeting as far as actual direct involvement (P19).

### ***Communication***

Effective communication between the LEAF research team, LEAF stakeholders, and setting stakeholders was vital for the LEAF process and for building and maintaining relationships. Continual check-ins allowed each group to raise questions and resolve concerns. Methods of communication seemed to play a particularly important role: participants valued in-person connections, such as LEAF recommendation meetings. On the other hand, at least one community found communication via email to be a barrier that disrupted the LEAF process:

P16: If people came to the meetings, then they would have input into it. But if I sent it out to them and said, ‘Could you please send me feedback?’ then nobody ever did. So, by email, it just was a disaster. Nobody ever sent me anything. You know, so I would say,

‘can you look it over, if there’s any changes,’ and there wouldn’t be any. And then we would come to our final meeting, our launch, and people would say, ‘oh, well this is wrong in the data,’ and, ‘this is wrong in the data.’ And I’m like, ‘Oh, well that’s too bad you didn’t tell me earlier.’

I: Yeah, so who did you send it to for feedback?

P16: Everybody. You know, I mean I had a long list of at least twenty people, like a long list.

At times, participants perceived miscommunication to be the result of communication breakdowns within target settings. As explained by one LEAF stakeholder, “(what) we had done was we talked to more of the (setting) managers to let them know what we were doing. And I just... I don’t know that that information was filtered down to the frontline staff” (P7). In this case, the result of miscommunication was that setting staff were not expecting the data collectors. Although LEAF stakeholders could minimize the effects of this type of miscommunication through interactions with the setting staff, other causes of miscommunication posed greater structural barriers. Namely, in at least one community, miscommunication was the result of the inability of LEAF stakeholders and setting stakeholders to converse in the same language (i.e. English).

## **Summary of Results**

This chapter outlined results pertaining to the LEAF process. Analysis of LEAF stakeholder interviews, communities’ Mini-NRCs, and participant observation revealed two main themes: building and maintaining relationships and process factors. Building and maintaining relationships consisted of three interconnected categories that represented strategies used by LEAF communities during the development of their Mini-NRC: treading lightly,

engaging the right people, and reaching a consensus. Each of these categories consisted of several subcategories. Process factors, which influenced the LEAF process and relationship building, consisted of four categories: community context, LEAF flexibility, changing players, and communication.

**Table 4. Overview of Categories, Subcategories, and Exemplar Quotes for Process Factors**

Category	Subcategories	Exemplar Quotes
<b>Process Factors</b>		
<p><b><i>Process Flexibility</i></b> LEAF steps, timelines, and methods of data collection were flexible and adaptable to each community's needs.</p>	None	<p>"P1: Some of the ease of collecting it was definitely the fact that they could do it easily with their smartphones and go out and collect the data. But I think both organizations ended up printing off questions... so I think a learning from that might be that it's good to have both methods for collection of information... being able to take pictures, and send the pictures was very helpful as well."</p>
<p><b><i>Communication</i></b> Effective communication between all involved groups was imperative for the LEAF process and building and maintaining relationships.</p>	None	<p>"I: So, you said you attended the last meeting (Mini-NRC launch)? P19: Yes. I: And did you find it useful? P: I found it very useful. It's just nice too 'cause, I had the report obviously, and you can get a lot of that information from the report regarding how everybody's doing. But it's nice to kind of hear—when you see and you talk to someone, you really get how they feel about it. It's not just some information on a page. So, it's kind of nice to see that everybody values it. Even in being in there, being able to meet yourself and others. It's nice to—I kind of felt much more at home getting more resources."</p>
<p><b><i>Changing Players</i></b> Lack of consistency among community stakeholders creating the Mini-NRC was a barrier for some communities.</p>	<p><b><i>Disrupting Continuity</i></b> One effect of changing players was the disruption of the LEAF process.</p>	<p>"P17: And then also changing members at the table. So, each meeting there was always different faces. And that's a challenge anytime you're trying to do a long-term report—the continuity."</p>
	<p><b><i>Creating Confusion</i></b> LEAF stakeholders that joined the process midway felt increased levels of confusion regarding the purpose or process of LEAF.</p>	<p>"I: Okay, so the next set of questions is about interpreting the data and coming up with recommendations. So, you mentioned that you weren't at the first recommendation meeting, but were you involved in the second one? P7: Yes, I attended the second one. But honestly, I felt quite a bit lost throughout that because I wasn't there for the first part. So, I didn't really contribute much to that conversation because I didn't know what was going on."</p>
<p><b><i>Community Context</i></b> Community specific factors, such as size, location, history with healthy eating initiatives, and current political context affected the LEAF process.</p>	None	<p>"P14: So, we've tended to do these (LEAF) in smaller communities. So, we're not doing it in our big centers... it's the smaller communities, where the dietitians feel like it's more a piece of work they can handle—because the data collection is more manageable in a smaller site. I: Just because there are less places to go? P: Yeah... And it's also easier to get your community partners, like everybody at the table in a smaller community."</p>

**Table 5. Overview of Categories, Subcategories, Exemplar Quotes, and Interconnections for Building and Maintaining Relationships**

Category	Subcategories	Exemplar Quotes	Interconnections
<b>Building and Maintaining Relationships</b>			
<i>Engaging the Right People</i> Using community engagement to facilitate the LEAF process and build relationships in the community.	<i>Offering Different Ways to Participate</i> Allowing different forms of participation (i.e. direct or indirect) and levels of participation (i.e. different LEAF stages) to increase engagement of the right people.	<p><b>Form of participation:</b> "P11: There was no one from the hospital or the city, and I didn't honestly expect them to come. But they've been very open and engaged in the one on one consultations. So, when we meet with them directly, they're very open to having discussions, and providing data, and working with us."</p> <p><b>Level of participation:</b> "P16: So after... I went with my intern and we definitely talked to all different stakeholders: the schools, the grocery stores, the hospital, rec centre. You know, the key areas that we thought we would collect the data from. And explained the project to them and asked if they wanted to collect the data, or if they preferred (that) we did. Umm so in the majority of cases, they preferred we collected that data. "</p>	The end result of engaging the right people (i.e. who participates in LEAF) impacts the felt need to tread lightly during the LEAF process and the consensus that is reached.
	<i>Utilizing Connections</i> LEAF stakeholders utilized their pre-existing connections and relationships to increase engagement of the right people.	"P5: I'm on a wellness committee in that town. And so, I had asked if those people would be involved. And then also if they could identify other community stakeholders to cover each of these areas."	
<i>Treading Lightly</i> LEAF stakeholders proceeded carefully during the LEAF process in hopes of minimizing the defensiveness felt by setting stakeholders.	<i>Obtaining Permission and Incorporating Requests</i> LEAF stakeholders engaged community stakeholders to obtain consent for the LEAF process and incorporate their feedback or requests.	"I: Were there any fears of infringing on people's privacy that you heard about? P1: Umm... I'm not sure if there were fears. There were some questions about taking pictures of menus and whether that would be a problem or not... whether that would be something that would bother the businesses or whether it wouldn't... I think in most cases permission was obtained from the business as to whether they could take pictures and use them."	The strategies used to tread lightly can impact the meaning of engaging the right people (i.e. who needs to be engaged). The felt need to tread lightly also impacts the consensus that is reached.
	<i>Using Sensitive Language</i> Attempting to create a non-judgemental product, LEAF stakeholders carefully chose the words and phrases used in their Mini-NRC.	<p>"P16: I did fear... making anybody look too unhealthy. Because if it came out looking that way... I'm just not sure if they would continue to want to work with us. I: Hmm. And why did you think that? P16: Well, if they felt that they were serving healthy food in the high school, and I said, 'I don't think you are—this is what we found.' Umm then they... they would be defensive, right. "</p>	

Category	Subcategories	Exemplar Quotes	Interconnections
	<p><b><i>Respecting What Exists</i></b> Each Mini-NRC recognized and built off of community strengths.</p>	<p>"P8: I mean we had to tweak it a little bit. In our community &lt;organization&gt; is a strong partner and they like to be the... the centre of a hub around anything food related. So, when they were at the table drafting recommendations, it was like 'well, &lt;organization&gt; can do this, and &lt;organization&gt; can do that' and it's like, well... some &lt;settings&gt; long since had—you know, years ago—had created partnerships... And so, we're not going to—and the &lt;setting&gt; didn't want to... destroy long-standing positive effective, you know, partnerships that are providing some of these things to &lt;setting&gt;, so that they can then say, 'well &lt;organization&gt; will do this instead'... So we did tweak some of the recommendations a little bit... we didn't want to take away from what's already existing."</p>	
<p><b><i>Reaching a Consensus</i></b> Creating the report card was an informal process where community stakeholders and the LEAF research team shared their perspectives and worked together.</p>	<p><b><i>Integrating Local Knowledge</i></b> LEAF stakeholders used their community knowledge to guide the LEAF process.</p> <hr/> <p><b><i>Integrating Outside Knowledge</i></b> LEAF stakeholders used provincial knowledge (from the LEAF research team) and other community knowledge to guide the LEAF process.</p>	<p>"P25: We just, I guess, know that (what is practical and relevant) about our community... And just knowledge of the community in itself. Who's there and in what positions. I guess it's all very community specific. So, if you have the wrong person working in the rec centre, it won't work, right. But we knew— like when we think of the things we did do, or start to tackle this year, we had quite a good... the lady who has the contract to provide the canteen at the arena is quite interested in healthy foods and has good cooking skills, so it became something we knew we could probably tackle, I guess."</p> <hr/> <p>"P10: And I was like 'oh &lt;other LEAF community&gt; did this, should we do something like that?' And then we decided that we did want to be more involved in creating the recommendations. And so then from that we created them."</p>	<p>Reaching a consensus is the end result of, and therefore is influenced by, engaging the right people and treading lightly.</p> <p>Further, integrating local knowledge (such as contextual factors) was perceived to be a strategy to help achieve treading lightly.</p>

## Chapter 5: LEAF Action: Results

This chapter outlines results pertaining to LEAF action and impacts from seven communities. Analysis of 26 LEAF stakeholder interviews revealed two types of impacts from LEAF: environmental impacts and non-environmental impacts. Non-environmental impacts are represented through the overarching theme *opening doors and continuing conversations*. Further, analysis revealed perceived *barriers and facilitators* to LEAF success and sustainability. Environmental impacts are presented separately in Table 6; non-environmental impacts and barriers and facilitators are presented together in Figure 4.

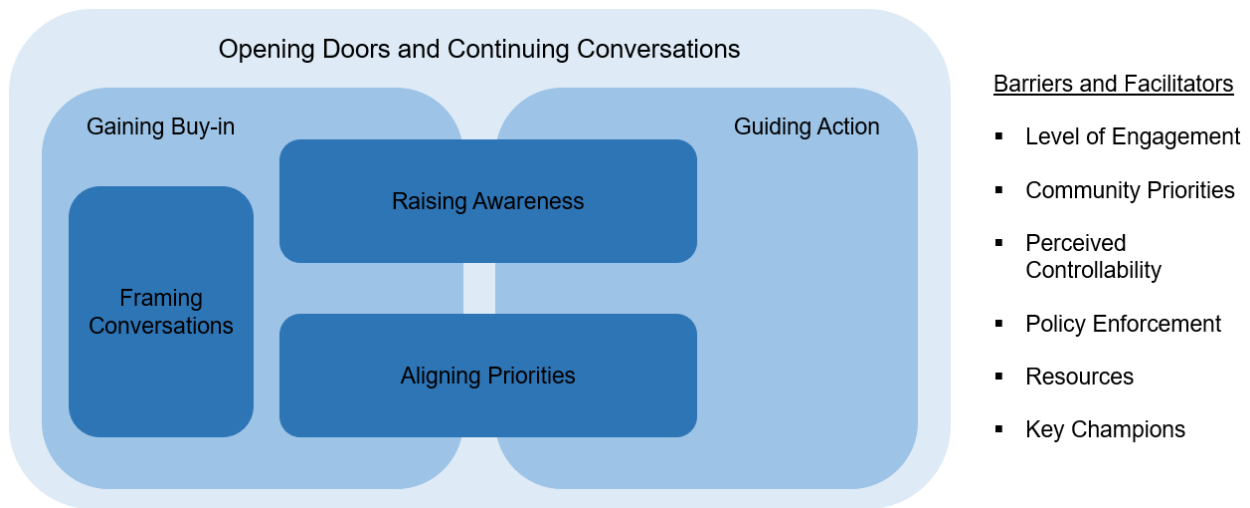
**Table 6. Reported Environmental Impacts of LEAF**

Environment	Setting	Impacts
Physical	Schools (n=5)	Increasing healthy food availability in hot lunch menus (n=2)
		Closing campus—students cannot leave the premise (n=1)
		Improving vending choices (n=2)
		Increasing Choose Most Often (CMO) and decreasing Choose Least Often (CLO) food availability (n=2)
	Recreation centres and arenas (n=3)	Increasing the availability of healthy options (n=3)
		Removing vending machines (n=1)
	Golf course	Changing menu items to increase healthy food availability (n=1)
	Library	Consulting to increase healthy food availability during summer programs (n=1)
	Hospital gift shop	Increasing CMO availability and decreasing CLO food availability (n=1)
Public facility vending machines	Increasing CMO food availability (n=1)	
Communication	Schools (n=5)	Removing unhealthy food marketing (n=1)
		Giving advice/info on healthy vending, healthy sporting events, and healthy snacking (n=2)
		Sharing resources (e.g. healthy eating starts here website and booklets) (n=2)
		Displaying healthy eating posters (n=1)
	Childcare (n=2)	Dietitians contributing monthly content to their newsletter (n=1)
		Sharing resources with parents (n=1)
	Recreation centres and arenas (n=4)	Marketing healthy options (through new signage, menu boards, email) (n= 3)
		Sampling healthy options (n=2)
		Displaying healthy eating posters (n=2)
	Golf course	Menu labelling (n=1)
	Grocery stores	Nutrition month challenge with healthy signage, tips, and recipes (n=2)
	General (n=3)	Healthy eating (and physical activity) challenge (n=2)
Displaying healthy eating posters (n=1)		
Table tent cards displaying "healthy eating messages" (n=2)		
Economic	Schools	Subsidizing fruit and vegetable trays in the cafeteria to decrease cost (n=1)
	Recreation centre	Sponsoring a healthy snack for youth bowling (n=1)
Social	Childcare Association	Sharing breastfeeding welcome signs with other stakeholders (n=1)
	General	Displaying breastfeeding welcome signs (n=1)
	City facilities	Displaying breastfeeding welcome signs (n=1)
Political	Schools (n=2)	Superintendents enforcing nutrition policies (n=1)
		School division planning review of nutrition policy (n=1)
		School reviewing nutrition policy (n=1)
	Town	Creating wellness policy (n=1)

Note. n= the number of communities that reported the impact



**Figure 4. Holistic Overview of LEAF’s Non-Environmental Impacts and the Perceived Barriers and Facilitators to Food Environment Action**



### **Environmental Impacts**

Across all communities, most environmental impacts occurred in the physical and communication environments. Only a few communities described action in their social, political, or economic environments. Environmental impacts were reported in a wide variety of settings, including schools, recreation facilities, and other community settings. Action in retail food environments (i.e. grocery stores or restaurants) was only reported in the two rural centres. Interestingly, some changes were made in settings that were not assessed by the community’s Mini-NRC (e.g. a golf course). Participants reported environmental impacts occurring both during and after LEAF. While many of the reported impacts may represent necessary steps towards achieving benchmarks, they did not always neatly map onto the indicators themselves. For example, two communities that reported increasing healthy options in their recreation settings (i.e. indicator: “high availability of healthy food in community settings”) also noted the importance of the marketing changes, such as sampling healthy options, that occurred simultaneously. While these marketing changes do not correspond to a specific indicator,

participants perceived these actions as helping to increase the success of the menu changes. Furthermore, although many communities' actions corresponded to their Mini-NRC recommendations, others did not.

Participants reported numerous barriers and facilitators that impacted LEAF's success and sustainability within their community, including *level of engagement, perceived controllability, community priorities, policy enforcement, resources, and key champions*. Collectively, these factors influenced the perceived community capacity to create healthy food environments, as they often acted together to either enable or restrict food environment action. Because of this, participants often viewed the Mini-NRC as a catalyst that stimulated or supported change, rather than viewing it as the sole cause of change. As explained by one participant,

Now, I'm not sure if they've (local food environments) changed just as a result of the report card itself... I think the report card came in at the right time—when they were interested in making change anyways—so, it would have helped to make positive change (P1).

Furthermore, these barriers and facilitators also influenced the ways that LEAF stakeholders used their Mini-NRCs. As such, the barriers and facilitators will first be briefly presented and will then be embedded throughout later sections.

## **Barriers and Facilitators**

### ***Level of Engagement***

The LEAF process was slightly different in each community, with varying levels of community engagement (as described in Chapter 4). Some LEAF communities extensively engaged setting stakeholders during the early phases of LEAF, whereas others did not.

Generally, participants perceived early engagement of setting stakeholders to be a facilitator of early LEAF success and lack of setting stakeholder engagement as a barrier to early LEAF success. When asked if LEAF had impacted the culture of the community, one LEAF project lead replied, “no. I think just because we didn’t really engage people early on in the process. It’s like we’re almost starting the engagement phase now” (P10). Participants reported impacts occurring during the LEAF process and after they received their final Mini-NRC. For some communities, impacts achieved during the process were a result of community engagement at an early stage. At times, early engagement meant that categories of Mini-NRC use also applied to the LEAF process. For example, communities that engaged setting stakeholders in creating recommendations began the process of *aligning priorities* (described below) while they were creating their Mini-NRC.

### ***Community Priorities***

Participation in LEAF and food environment action often depended on community stakeholders’ priorities. Participants frequently cited *aligned priorities* as facilitating engagement in LEAF and food environment action and *competing priorities* or *changing priorities* as barriers. In some cases, it was not clear to participants why community stakeholders refused to participate in LEAF or food environment action: they simply seemed uninterested or declined to participate. For these community stakeholders, food environment action was not considered a priority. Typically, community stakeholders fell into one of three groups: those that prioritize nutrition, those that value nutrition, and those that are resistant to changes. These groups differed in their interest and involvement in food environment action. Those that prioritized nutrition were described as already interested and in some cases were already acting to create healthy food environments; those that valued nutrition were described as being open to changes but were not

actively seeking out ways to improve their food environment; those that were resistant were described as not interested and not currently acting to create healthy food environments.

**Aligned Priorities.** Aligned priorities at the individual, setting, and community level were a facilitator for creating healthy food environments. As explained by one participant, “so (for) myself, here at the school, because of the way we’ve been having this healthier stuff going on for a longer period time, I don’t get it too bad here at school” (P4). Due to the significance of this subcategory’s influence on food environment action, its meaning and importance will be developed and expanded on throughout the results.

**Changing Priorities.** Changing priorities, or turnover, were a barrier for creating healthy food environments. Participants commented on both the historical and current impact of turnover within and among settings. Turnover in whole settings (e.g. restaurants) or key individuals (e.g. principals) often created new setting priorities—priorities that weren’t always aligned with food environment action. Further, in some cases, participants reported that turnover among LEAF stakeholders decreased the momentum of LEAF. For example, changing professional priorities among a community group that was leading LEAF disrupted their regular meetings, in turn decreasing LEAF action.

**Competing Priorities.** Competing priorities at the individual, setting, or community level were a barrier to creating healthy food environments. In many cases, competing priorities were a barrier to acting because they decreased the amount of time that stakeholders could dedicate to food environment action. For example, many of LEAF project leads worked in multiple communities, limiting their time dedicated to each community. Further, many settings had priorities beyond healthy eating. For example, schools had to balance healthy eating with academics, physical activity, mental health, etc. As explained by one LEAF project lead,

With schools, I feel like they're inundated and overwhelmed and have so much to do that this is kind of the side of the desk thing. Not that they don't feel it's important, but that there's many other day-to-day things that are occurring, which comes back to time and staffing often for that setting (P2).

Numerous health-related priorities within schools meant that LEAF stakeholders working in schools (e.g. school health facilitators) also had many competing work priorities. As summarized by one participant, stakeholders had to “weigh nutrition” against the multitude of competing priorities within their job or setting.

Some competing priorities posed challenges beyond decreasing the time dedicated to food environment action. In all LEAF communities, financial barriers were a competing priority that limited and restricted food environment action. At times, financial barriers were felt widely across the community. For example, several communities cited widespread financial turmoil as a barrier to policy creation. As explained by one participant, “there's so much other turmoil going on right now with regards to all the cuts that it just—policy for recreation is just not on their agenda right now” (P16). More commonly, financial barriers manifested as the need for certain settings to maintain profitability.

Maintaining profitability was an important factor for many community settings, including recreation facilities and schools. At times, setting stakeholders' beliefs and past experiences with providing healthy food were barriers to engaging them in making changes. Some setting stakeholders resisted changes due to their belief that healthy food would not sell. When asked if local settings had pushed back as a result of LEAF, one participant responded, “yup, and it just came down to what sells. So, with <setting>...the pushback was, ‘that will not sell. So, I'm not going to spend money to purchase it because I know it won't sell’” (P3). In some cases,

community stakeholders failed past attempts at providing healthy food reinforced their resistance to making changes. This was demonstrated by one participant's skepticism towards public surveys: "the only thing that I question is the public response to surveys... especially when we've tried sometimes to bring fresher food and to put healthier options in gas vending machines... and then it goes bad" (P12). Several communities reported that in the past, recreation facilities had increased the availability of healthy food but were unable to sustain these changes due to a loss in profits. For some, even small fluctuations in profitability could have large personal impacts. For this reason, they were hesitant to make changes that they perceived as potentially affecting profitability. As explained by one participant,

So you hear a lot of him (local vendor) when I call or when <LEAF project lead> calls him to say, 'hey, you know, we'd like you to try different options.' 'Cause it's his business. It's his mortgage payment. It's like... he's not a billionaire and he's just doing it for fun. That's his living. So, when things don't sell... he has a problem (P12).

Maintaining profitability was also a consideration for some schools. Unhealthy food fundraising provided funding for school activities and events. Furthermore, some schools had to consider the need for maintaining the profitability of third-party vendors operating in their schools. As explained by one participant,

But it's a slippery slope. 'Cause I know some schools it would be me hiring someone to run my canteen, in which case I can dictate everything. I either make money or lose money—it's all mine. So that's easy. For her, she pays monthly rent to the school to run her own thing there. So... I value the fact that she needs to make money; otherwise, she's going to walk away from it... Right, so it's not like it's a service that exists no matter

what we do for nutrition. If she's not making money, she walks away, and we don't have it there (P19).

In some communities, the need to maintain profitability was experienced on a town or city-wide level. In one community, the need to maintain profitability was enforced through city mandates.

The impact of this was explained by one LEAF project lead:

Still not really a lot of buy-in because there's so much concern about the financial aspect. Yeah, I mean not just because of the current political climate and budget—even for the last several years because of our community's financial deficit. We've had a financially fit mandate, where city departments must not lose money. So, it's a real big concern because food services in the rec centres don't really make money anyway. It's really more of a subsidized service. They just can't look at losing more money, so they're really hesitant (P8).

### ***Perceived Controllability***

Perceptions of controllability also influenced the perceived capacity to create healthy food environments. Although LEAF stakeholders were interested in food environment action, they did not always hold power within community settings. When asked what areas were the hardest to impact, one LEAF project lead replied, “I don't know, there's challenges with all of them 'cause we don't really have control over any of them” (P8). Factors that influenced community stakeholders' perceived controllability over local food environments included the *external influences* and the *ubiquity of unhealthy food*.

**External Influences.** The presence of external influences represents the local and non-local actors that possess control over aspects of the communities' food environments. Local and non-local actors influenced perceived controllability in several ways. Participants commonly

reported less general control over settings that were controlled by non-local actors, such as chain grocery stores or vending machines controlled by large organizations. As explained by one participant, “we have no influence over what Walmart would do locally because they can’t influence what they do locally” (P17). Within some settings, there were multiple local parties that each had a role in influencing the food environment. For example, local third-party vendors, parent councils, and school administration often all played a role in determining the status of the school’s food environments. As explained by one participant, this made school food environment action challenging, “because when you’re thinking of the environment... like food around the school community, there’s so many factors involved... like the whole school community’s a big picture. And there’s so many different pieces and so many different people involved” (P13). Further, some LEAF stakeholders expressed a lack of capacity to influence children’s nutrition, as they believed parents were the ultimate driver of the children’s eating behaviours.

**Ubiquity of Unhealthy Food.** The high availability of unhealthy food throughout LEAF communities was a barrier to action. At times, the high presence of unhealthy restaurants or unhealthy food items within the community decreased participants’ perceived controllability over their food environments. As explained by one participant,

We do things like we banned pop. You can’t bring pop in your lunch ... and that was an easy one for us. And, you know, you have lots of evidence to back that up. But then there’s the kid that brings the 500 ml juice. Is that any better? No (P21).

The ubiquity of unhealthy food may have also affected stakeholders’ views on the perceived impact of possible changes. For example, some participants reported that school stakeholders were resistant to changes due to the belief that students could easily access unhealthy food even if the school did not offer it. Beyond influencing perceptions, the ubiquity of unhealthy food



products also made providing healthy food challenging and time consuming. For example, setting stakeholders expressed difficulty finding healthy options that could be stocked in vending machines or frozen and easily prepared in concessions or cafeterias. As one LEAF project lead explained,

I've been non-stop trying to help them find healthy food 'cause they're having so much trouble finding healthy food for vending machines... but it's impossible, it's impossible. So that's a huge barrier. And it's really discouraging that we're asking people to move towards Choose Most Often, and not giving them a good mark if they don't hit the target, when there isn't even food to access for the vending machines. So, so really, you really can't have vending machines. I mean it's kind of discouraging (P16).

### ***Policy Enforcement***

Policy enforcement refers to the process of monitoring and ensuring that settings are complying with existing policies. In some cases, policy enforcement was a facilitator for food environment action, as it helped align setting priorities (discussed below). It is important to note that policy existence alone was not sufficient for action. Settings that had policies in place but lacked policy enforcement were often dependent on the values and priorities of relevant decision-makers. This was best exemplified by one LEAF project lead's interactions with a community setting that lacked enforcement of their existing policy:

And I spent pretty much like an entire afternoon with them, kind of like, 'according to our guidelines, like these are our Choose Most Often, these would be a Choose Sometimes,' like, 'this is the criteria we're looking at, here's where you can find the information, here's some suggestions of new and other foods that you can offer that fit within these guidelines.' ... and just no change. And I'm just not really sure who—like

there's no real accountability there. Like... if you're not following these guidelines, who's the one that says, 'okay, well you've lost your contract.' I don't...it's not very clear who that would be (P5).

### ***Resources***

Material and human resources also influenced stakeholders' perceived capacity to create healthy food environments. Thus, available resources were a facilitator for action, and a lack of resources was a barrier for action. Participants commonly reported funding, staffing, and equipment as determining the type and amount of action that settings could take. In particular, the availability of material resources, such as grants, was seen as a facilitator to creating action in local food environments. As explained by one participant,

The grant that we received for \$5000—I think those are fantastic. It's not a whole lot of money, but it gives you a little bit of flexibility. Like, for example, advertising. So, one of the things we're doing with that grant is we purchased two TV monitors, so (that) we can go electronic and put that overtop of the concession door. So now we can change the menu, or we can put 'today's special is soup and a bun,' or something like that. Where in the past, we wouldn't have been able to because we would purchase one menu for the year—'cause menus are not cheap... you know, four by eight menus that you put over top of the concession. They're not cheap, and because money's an issue, you do them once a year and then you're stuck with it, right (P12).

The influence of resources on food environment action was demonstrated when participants were describing LEAF impacts. Often, participants would comment on how material and financial resources helped contribute to making the reported changes. The impact of such resources was particularly salient in one community that made changes in their retail food environments. Here,

the LEAF community group used their own financial resources and time to create healthy signage for grocery stores.

### ***Key Champions***

Participants perceived key champions as being vital to LEAF success and sustainability. Key champions included individuals, groups, and organizations that could be leaders in creating food environment action. Commonly, the need for key champions manifested as the need to have a group that could continue meeting and discussing progress related to LEAF. As explained by one participant,

I think one of the key things has been that there really has to be an existing group within the community where they're interested in doing health promotion activities. So, there has to be a wellness committee or group that's interested in improving. Otherwise... there's no way to move it forward, right (P14).

However, one LEAF project lead felt that there were limitations to this approach in their community:

We'll probably continue talking about it at our Choosewell meeting, but I don't see the changes coming from a committee and being like—when I hear about that structure, it doesn't seem like it's going to work for our community. 'Cause that seems like a top-down structure. Whereas the approach we're kind of coming from is like educating schools, educating the rec centre, the hospital, food service, and the vendors and seeing what changes they think they can make. And using the recommendations as like kind of potential changes. Because some of the recommendations are pretty general, like 'increase the amount of Choose Most Often foods,' but I don't think we see having a committee that's kind of deciding which things to work on next (P10).

Participants often described support from key champions with decision making power as facilitating food environment action. As explained by one LEAF project lead, “I mean, to have a champion like a city councillor on our group is like, okay, we can move mountains” (P16). However, many communities expressed past difficulties with sustaining the work of key champions, as changing priorities created turnover in individual positions. This was demonstrated within the context of LEAF in a few communities. As explained by one LEAF project lead,

P5: The person we had, who was a really great champion in that area, isn't in that role anymore.

I: And he was involved in collecting the data?

P5: Yeah. Collecting the data and like all of the work with, you know, the rec centers and bringing it to council to see if we can make some changes. It's just—that's been lost, and so it's also, you know, kind of looking at areas where we had a lot of potential—it just isn't there in the same capacity anymore... just like the whole dynamics of it all have changed a little.

### **Non-Environmental Impacts: Opening Doors and Continuing Conversations**

In addition to environmental impacts, participants reported non-environmental impacts of LEAF in their community. Namely, LEAF produced a context specific tool that could be used to promote and support food environment action through the overarching theme opening doors and continuing conversations. Opening doors means intentionally finding and engaging a range of community stakeholders in food environment action; continuing conversations means strategically following up with these community stakeholders. Participants described two main understandings of the purposes of these interactions: *gaining buy-in* and *guiding action*.

Participants attempted to achieve these goals by using their Mini-NRCs in various ways: *raising awareness, framing conversations, and aligning priorities*.

Opening doors and continuing conversations was perceived to be a method for achieving changes in local food environments. LEAF provided participants with a reason to start conversations about food environments and complete assessments in new settings. LEAF also provided a reason for LEAF stakeholders to continue connecting with a range of community stakeholders, including those engaged during the LEAF process. As explained by one participant,

You know, having gone through the report, the conversations, and the meetings that we had has really opened the door for conversation. And so, I think that continuing that conversation—continuing to be a support to schools, getting them some resources and some materials. You know, being about to find out—find fun ways for them to do healthy food things. I think that... that's really key. Because if we can keep that conversation going, then we can continue to make changes (P18).

The range of purposes for using the Mini-NRC reflects differences in LEAF community context, including stakeholders' perceptions and priorities. Different community stakeholder groups required different strategies of engagement and levels of support from LEAF stakeholders. For example, stakeholders that prioritized nutrition were more likely to be described as taking self-motivated action than stakeholders that valued nutrition. Instead, success in settings where stakeholders valued nutrition seemed to depend on continual engagement and support from LEAF stakeholders. This difference is reflected in the difference between one participant's interactions with two community stakeholders:

So, for the foods teacher, she kind of did that part on her own. She took what we gave her, and she implemented it. And put what she could to fit her foods class—she put it into the menu. We didn't really help her with anything past there. At the <public setting>, we sat down with her personally, gave her recommendations, and asked what she thought... So then executing it... I did more of the grunt work for that, I would say, rather than the person working there. So, I actually revamped her menu for her. So, she was like, 'I want to change—I'm open to changing this, this, and this on my menu'... and so it was actually me who put together her menu and provided it to her. And when she liked it, then she put that on display instead of her old one... The school did more of the execution on their own end. But for, let's say, public places... it was more us doing it—and her being okay with it though—but not necessarily going, 'well, I'm going to take this home and change the menu myself' (P3).

### ***Gaining Buy-in***

Participants perceived buy-in from local community stakeholders as vital for creating healthier food environments. LEAF stakeholders defined buy-in as active support, which they differentiated from passive support. As explained by one participant,

Part of the challenge is getting people involved in a really meaningful way. I mean a lot of people will come out to a meeting and say, 'yeah, that's a good idea—do that, that's great.' But I mean getting people really involved, as in committed like they'll speak to their agency, they're willing to help do the leg work that's required (P11).

As such, gaining community buy-in, or active support, for food environment action was one main goal of developing and using the Mini-NRC. While developing their Mini-NRCs, some communities intentionally used the LEAF process to gain buy-in from community stakeholders

(as described in Chapter 4). LEAF project leads often attempted to gain the support of all community stakeholders but targeted those viewed as decision-makers. In some cases, participants reported increased buy-in as an outcome of LEAF:

But this (LEAF) has provided kind of more of a springboard to get buy-in and see success in the community than when they just go in as a dietitian saying, ‘have you considered making this change.’ They’re seeing a lot more success and buy-in through this process (P14).

However, many participants also commented on the need for continued conversations to increase community buy-in. As explained by one LEAF project lead, “So, in terms of getting others on board—we are working with <lists two public settings>, that kind of thing. But really, outside of our little committee, there hasn’t been a ton... it’s still kind of slower going if you will” (P2).

LEAF stakeholders attempted to gain buy-in during and after LEAF through framing conversations, raising awareness, aligning priorities, and guiding action (discussed below). As shown in Figure 4, all of these strategies, except framing conversations, have purposes beyond gaining buy-in.

### ***Framing Conversations***

Communities used LEAF and their Mini-NRCs as a way of framing conversations during attempts to gain buy-in or build community support for food environment action. As explained by one LEAF project lead, “it’s (the Mini-NRC) a really good conversation starter. Like a reason to start a conversation with these different organizations, rather than just calling them out of the blue and being like, ‘hey, want to talk about healthy eating environments?’” (P10). Participants felt that several aspects of their Mini-NRC were useful for framing conversations, which is

demonstrated through the subcategories *highlighting the collective approach*, *grades providing validation*, and *re-collecting data as motivating*.

**Highlighting the Collective Approach.** Participants often felt that a positive and collective approach was necessary for creating food environment action. Within the context of LEAF, the collective approach was reflected in the Mini-NRC being part of a provincial strategy, involving communitywide data collection, and involving input from numerous sectors. Although the complete objectivity of the Mini-NRC was debated, participants generally viewed it as a collective opinion that was created by various interest groups and was based on evidence and best practices. As explained by one participant,

It's just nice that it's not my opinion: it is a group's opinion. So, 'here's our report card, this takes into consideration nutrition as health experts are looking at this. (There's) recommendations from private and government agencies. Everybody's kind of agreed that this is our score and where we could be.' That's pretty hard to dodge those results. It's pretty hard to argue them when you're having a conversation with parents or other stakeholders...it basically comes across like gospel. This is our report card and this where we want to get to. It's nice (P19).

When attempting to engage setting stakeholders in food environment action, some participants began by highlighting the collective approach, as well as noting that all settings have room for improvement. These participants perceived this approach as increasing the likelihood that setting stakeholders would be interested in making changes. As explained by one LEAF project lead,

Like when you see something that's not great, you can't just call someone out on it, right? Well, not call them out, but... it's easier when you have something like the report



card to be like ‘this is why I’m here, and we did it with a bunch of other settings.’ So (that) people don’t feel like it’s just them, like its communitywide approach. So, I think that’s very useful (P10).

Some setting stakeholders provided evidence for this assumption, as they stated being comforted by the fact that the province and most community settings had room for improvement. As explained by one participant,

So, you know, it would be a little harder to take if every other school in town was an A+, and we were a D. Umm but knowing that every school can make improvements... and (that) there’s faults with all of us. At least it’s a good start because at least it kind of shows, ‘Okay, let’s all get better. Let’s work together through the process. Let’s share some common practices that are good for us and go from there’ (P19).

**Grades Providing Validation.** The Mini-NRC provided validation in two ways: for settings that scored well, it provided validation for their current actions; for settings scoring poorly, it provided validation for the need to make changes. In both situations, the Mini-NRC provided a point of reference about what could be done to improve the local food environments.

Receiving a high grade on the Mini-NRC provided some settings with the reassurance that their actions had positively impacted their setting’s food environments. Participants in these settings often shared their Mini-NRC results with relevant stakeholders as a way of validating and promoting their current actions. Often, this meant sharing results with groups already on board with creating healthy food environments. However, positive results were also used as an attempt to gain support from relevant groups that were more resistant to creating healthy food environments. For example, one participant described sharing their Mini-NRC with resistant parents to validate the setting’s strict requirements for food brought into the centre:

I'm just emailing it out—the report card—to my families with our March newsletter... So yeah, I'll be using it. Right now, to send out the results, but... I think that I'll also be using it to help continue to promote our decisions of why we ask for what we ask for—for food servings—and how to teach the kids (P23).

Receiving poor grades in the Mini-NRC validated the arguments of those interested in creating healthy food environments. Participants reported using their Mini-NRC to validate the need for change during discussions with community members and a wide variety of settings, including schools, childcare centres, recreation facilities, and town council. In at least one case, the Mini-NRC was used to validate arguments for change within a grant application, as the setting's results illustrated their need for funding:

But the first thing we decided to tackle was—and it was very timely because there was a grant through Choosewell that was available to work on the healthy food available in your arena settings... We applied for it, and we were able to get it. And I used the fact that this pre-work had been already done—like this benchmarking work had already been done—as one of my arguments for why we would be a great fit for it... we had already done information showing how desperately we needed a makeover of the food in our arena... Yeah, so I used that in my grant application, and we were awarded it (P25).

**Re-collecting as Motivating.** Participants felt that the possibility to re-collect data could be used to motivate changes in community stakeholders, as it would provide these stakeholders with the opportunity to see improvements in their settings (through seeing improvements in their grade). As explained by one participant,

And then maybe we would do our own update to it, right. Like collect more data and see how things have changed. 'Cause initially that's why I was really interested in doing

this—to help gauge the change, right. Like there’s nothing worse than when you know you’re working so hard towards something, and then you feel like nothing has changed anyway. So, with our health champions, and admin, and all those in the school, I think they would like to see if it’s made a difference in a few years (P24).

Evidence of the re-collecting data as a motivating factor was demonstrated in at least one setting stakeholder, who continued to engage in discussions about making changes and improving grades with LEAF project leads after the Mini-NRC was finalized:

So, we (participant and the LEAF project lead) talk quite regularly because of the report card. How to improve things and how to score points—because I think we scored D minus... And she just gave me little tricks that, you know, we don’t have to re-invent everything... So little tricks like that that could help us improve our report card. And we say report card, but it’s going to improve the services, I guess (P12).

### ***Guiding Action***

Participants used their Mini-NRCs as a discussion tool for guiding action in settings that were interested in creating healthy food environments. In settings where support for food environment action was lacking, gaining buy-in was viewed as an important precursor to guiding action.

The Mini-NRC helped to guide action by providing a baseline assessment that could be used to monitor progress. As explained by one LEAF project lead,

We can look at it (their Mini-NRC) and go, ‘Okay, this is how we were doing in 2019. Now it’s, you know, 2022, how far have we come from there?’ Right. I think it’s a good tool to use as a reminder of the need to continue moving forward and to get better. But it gives us something to move forward from (P18).

Progress was often monitored through meetings held by LEAF community groups or meetings held within specific settings (e.g. school meetings). During these meetings, updates were provided, and next steps were discussed:

Next week we're at the <school district> admin council meeting again to quickly touch base on the benchmarking—we've already presented it to them. But then we also discuss what changes they've made, what's going well, what are they struggling with, like what would be a big win for them in the next year (P13).

The Mini-NRC helped guide the work of LEAF stakeholders, particularly those whose professional roles included creating healthy food environments, by outlining areas and actions that community stakeholders deemed as priorities. At times, LEAF stakeholders had the capacity to provide the needed support. This meant that some of the community stakeholder requests made during the LEAF process were also responded to during the LEAF process. In communities that assigned recommendations to specific individuals, recommendations were often assigned to health professionals, such as public health dietitians. In some cases, participants perceived this to be the result of a lack of community stakeholder accountability to creating healthy food environments. As explained by one LEAF project lead, “if I came up with something, it was like, ‘well, we’ll assign it to the dietitian.’” (P5). However, involved health professionals also noted that many of their assigned recommendations are within their job description. As explained by one participant,

Yeah. So I think this is good data for the dietitians to guide their work in the community, right. So, I think you can really look at the data and the recommendations in the report card and say, ‘okay, where should I focus my time and energy in this community around healthy eating environments for children and youth?’ Right. Which is one of our priority

areas of work. So, then they can prioritize their work within the community based on the data collection and the data in the report card to guide their actions in the community (P14).

Further, the report card provided tangible tasks for community stakeholders to work on, which helped to increase their perceived capacity to create healthy food environments. Tangible tasks were especially important for stakeholders that prioritized nutrition but didn't know where to start. As explained by one participant,

I think like the divisions only want to have healthier school communities. Like, that is their goal. And sometimes they just don't know how to do that. Or sometimes they don't know what. So, if you're going to come in and just provide support in a positive way, then for sure they're going to be willing and open (P13).

Many LEAF stakeholders stressed the need for slow, incremental changes towards healthier food environments. As explained by one LEAF project lead, incremental changes or "early wins" could help build credibility for LEAF and promote future food environment action:

So, I think what our group will need to do now is work at it—in terms of identifying it's initial target places—where it wants to start to try having some success... so then as that starts to make a difference, then we'll be able to have some success, then you've got a little bit of credibility in the community—that this is a good thing and it needs to happen—and we get some feedback from the public that they're happy about these things, and then I think that will help (P11).

The need for incremental change was also reinforced by some communities' past history with nutrition-related action. For example, one participant attributed a failed past attempt at providing healthy food in a recreation facility as making too many changes at once: "I think they tried it too

quickly. They just said, ‘all healthy!’ and didn’t — (laughs) you need to phase it in a little bit” (P4). The Mini-NRC structure, which breaks settings down into environments and relevant indicators, enables community stakeholders to focus on realistic goals. In some cases, tangible tasks increased the accountability of community stakeholders to the goal of creating healthy food environments. As explained by one LEAF project lead,

We (community group) often talked... ‘yeah, well what about healthy eating?’ So, then I’d talk a bit, I’d share a few resources, but nobody was really working on it with me. Like, you know, I’m a lone person, and I don’t live there. So, until people started to put their—it was more of an agenda item, that we had tangible to-dos and things—it wasn’t really getting addressed. So, I do feel that it has gained a way bigger profile—like the healthy eating and the support. I feel like the committee members always supported it, but nobody was helping. And now they’re all helping. So, it’s lovely. For me anyway (P2).

While the Mini-NRC seemed to act as a discussion tool to guide action, at times it guided action in a way that was not prescriptive: the Mini-NRC was not used as a static document that prescribed change. Instead, it seemed that community stakeholders were using it as a starting point and diverged from recommendations when necessary. This is demonstrated in participants’ accounts of Mini-NRC impacts, as they often described changes that were related to the Mini-NRC but were not listed as recommendations. Reported impacts even occurred in settings that were not assessed by the community’s Mini-NRC (e.g. a golf course). By using the Mini-NRC to guide conversations instead of prescribe action, participants described working with setting stakeholders to find actions that they deemed as feasible. In some cases, this meant finding and

pursuing alternative actions (i.e. actions not listed in the Mini-NRC). As explained by one participant,

She's (setting stakeholder) usually able to kind of digest the information and come back with something that is much healthier in place of what she had. Maybe not perfect, but a good middle ground for the time being as we kind of move towards the final goal (P19).

### ***Raising Awareness***

Participants commonly reported increased community awareness about the status and impact of local food environments on children's eating behaviours, as this was one of the main ways that they were using their Mini-NRCs. Participants understood raising awareness as being the first step to creating healthier food environments and outlined two main purposes of raising awareness: gaining buy-in and guiding action. At times, the process of raising awareness led to food environment action by *creating a sense of urgency to act*.

However, most participants reported not being surprised by their Mini-NRC results. They attributed their lack of surprise to their prior work experience or long-term residence in the community. For the few participants that did report feeling surprised by their Mini-NRC results, being involved in the LEAF process led to increased awareness about the status of their local food environments. As explained by one LEAF stakeholder, "I guess before this, I never really noticed how many non-healthy options were being provided to people. So yeah, I was surprised through it all" (P3). Additionally, some participants reported increased awareness in relation to their job. When promoting optimal nutrition was part of a participant's job, LEAF often provided useful updates and highlighted areas that needed attention. As explained by one LEAF project lead,

There were some findings that the health promotion facilitator and I were both like, ‘this is part of our job,’ and, ‘this is what we do in your community.’ So, it’s a little surprising because they’ll say like, ‘no we have no supports in this.’ ... So even just for me, like that awareness wasn’t there (P5).

Although raising awareness often occurred after the Mini-NRC was finalized, some communities reported using the LEAF process as a way to raise awareness. For some LEAF project leads, recruitment for LEAF was viewed as an opportunity to promote awareness about the project:

And I generally felt that it was better to be more inclusive and go as broad as possible because I felt that we don’t—I’m not concerned if they don’t come. I want them to know about the project, and it was a way of creating awareness on the project... if I’d invited 100 people, I wasn’t expecting 100 people to show up. So, I was just using it as an excuse to promote the project, and I promoted it to people I didn’t think would actually come. So, I used a broader dissemination strategy, broader than probably—I think most people you would talk to would say, ‘oh no, don’t invite them,’ you know, ‘because they’re not coming.’ But... what my experience has shown me is that, you know, we’re using these as a way to promote and market the project, not just to find the worker bees (P11).

In addition to raising awareness about the status and impact of local food environments, some participants described using LEAF as a way to raise community awareness about the available supports for creating healthy food environments. Along with posters that were commonly distributed at LEAF meetings, this included the contact information and services of LEAF stakeholders. As described by one LEAF project lead,



I find the most success with those one on one conversations after... just encouraging them (community stakeholders) to contact me, either by email or phone. But also, if they don't, just touching base with them to say 'hey, how's it going? Is there anything you need from me?' you know. That's where we'll have a conversation...to say 'oh I'm really having trouble sourcing things out,' and we'll try to brainstorm and find a way to, you know, to find solutions to the challenges and barriers they're finding... And I think the more you have that connection back and forth, the more you can kind of make people aware that 'yeah these are partners that can help.' So, it's making them aware of the need for change and the changes that need to happen, but also making them aware of supports that can help them in that process (P8).

After completing LEAF, communities shared and discussed their community-specific results to raise awareness. Participants reported both passive and active methods of sharing. Passive methods included sharing their Mini-NRC through email newsletters, blog posts, newspaper articles, and radio podcasts. Active methods consisted mostly of presenting the Mini-NRC to various groups: parent councils, town councils, students, etc. While all communities used their Mini-NRCs to raise awareness, they had differing opinions on the best approach and their openness to sharing their results (see Chapter 4). Those communities that made their Mini-NRCs publicly available commented on the need to raise widespread awareness about the status and impact of food environments on children's eating behaviours. As explained by one LEAF project lead,

We thought by sharing it publicly it would help bring greater awareness to the impact that settings have on eating. There is still a fair bit of resistance... a little bit of questioning about, 'well, you can't tell people what they should eat or why they should—why a

vending contractor should price it a certain way.’ And it’s like, ‘yes.’ And so, you have that conversation about the effect that the eating environment has on people’s choices. And how when it’s in a public environment—yes, it’s a private business—but in a public environment there is that responsibility, I think, that expectation and awareness that you’re impacting people’s health. So, I think by putting it—by making that report card public, it would help with some of that awareness and knowledge sharing (P8).

**Creating a Sense of Urgency to act.** At times, the process of raising awareness about the status of local food environments also worked by creating a sense of urgency to act. This was demonstrated through the self-motivated food environment action of community stakeholders. Although LEAF stakeholders often provided implementation support, self-motivated community stakeholders were described as needing less encouragement than other community stakeholders and were willing to dedicate their time to food environment action. As explained by one LEAF project lead, “honestly... for the most part, they’ve been kind of self-motivated. So, we give them something to do, or they have a direct action, and they can go take it.” (P18). Aligned priorities seemed to increase the likelihood that raising awareness would create a sense of urgency to act. In individuals with aligned priorities, particularly decision-makers, surprising negative results led to quick action to improve these areas. Other factors included policy enforcement and available resources. The role of policy enforcement in creating a sense of urgency to act was particularly evident within the school setting of one community. Here, raising decision-makers awareness of the status of their food environment was sufficient for creating action because it informed them that their nutrition policy was not being adhered to. With new knowledge that their policy was not being followed, the decision-makers acted quickly, contacting relevant parties to outline expectations. Their Mini-NRC not only raised their

awareness about the status of their food environments, but it also created an urgency to act. As explained by one participant,

P13: He (superintendent) was just like... 'what's going on in that school?' ... like, 'I don't know, that's shocking that they have vending machines full of pop,' for instance... But what it helped was (to) make him more aware that this is a conversation. They have a nutrition policy, for example. This is something that why have it if nobody's following it... For example... <school name>, that was one of the ones where vending, for instance, was just really not great. And actually, quite shocking as well... So, that is where we're making movement... they've talked with the vendors of those, they're getting rid of— even just like having water fronts on the vending machines as opposed to the pop because that's part of the nutrition policy. And it was just a simple conversation and those things have already started to happen...

I: Was that—I'm just trying to understand. So, did the superintendents share school-specific data with that school? Or was that you going into those schools?

P13: So for that specific example, that was after me and the superintendent connected. That just was like one piece. Like that school got a pretty bad grade. And I think that—so what had happened was the superintendent just connected with that school right away. Yeah, so he just—because to him it was important to make a change. He connected with that school, looped me in on what was happening, and then that was just more of just an urgency of him to do that.

Creating a sense of urgency to act was also influenced by available resources, such as funding.

The role of funding was illustrated in a different community, as raising decision-maker

awareness led to self-motivated action that was supported by available funding. As explained by one LEAF project lead,

Oh, we did have one small success story... what really stuck with one of the people on their nutrition team, at the school, was that healthy eating—or healthy foods—are more expensive than unhealthy foods. And so, like quite like soon after, I feel like it was the next week, they started subsidizing their fruit and vegetable trays—like just individual size trays at the cafeteria. And they reduced the price from \$2.50 to \$1. And they saw like a huge increase in sales... and they just decided to do it on their own. We met with them before about making some changes, so they were definitely ready to make changes. But then after seeing the report, I guess it was that one that they thought, ‘well, we have the nutrition program money.’ So they decided to subsidize fruits and vegetables (P10).

### ***Aligning Priorities***

Some communities described using the LEAF process and the Mini-NRC as a discussion tool to aid the process of aligning priorities among community stakeholders. Aligning priorities means bringing community stakeholders’ other priorities into agreement with food environment action. Participants reported working to align competing priorities with the goals of gaining buy-in and guiding action. Several factors were perceived as influencing the process of aligning priorities, including available resources and policy enforcement.

During the process of creating the Mini-NRC, aligning priorities was particularly evident during the recommendation meetings. Community stakeholders attending these meetings discussed and debated what could and should be done to improve their community’s food environments. In some cases, these conversations continued beyond the meetings. Some participants described including a wide range of other community stakeholders in creating

recommendations to help them understand what recommendations would be perceived as acceptable by other relevant parties. As explained by one participant,

P19: We also talked to our school council—the group of parents there. 'Cause it's, you know, they kind of represent the parents, so we really want to listen to them. And their biggest thing was—we had some parents saying, 'well, look. I give my kids that five bucks once a week. They deviate from their regular lunch, and they love the fact that they can have fries and gravy once a week.' Other parents are saying (that) they don't want to have it every day of the week—'Get rid of it.' So, it's an interesting conversation among parents about the idea of 'why is it the school's job to control and maybe it's yours.' And we kind of went back and forth. And then, as a parent group, we settled on the sugars 'cause it's hard to learn when you're jacked up on, you know, huge super cans of coke and slushes and that kind of stuff. And that's when we got rid of all those in our building.

I: Oh, okay. So, you included your parent council in creating recommendations?

P19: Yes. Yeah.

Participants also reported using their final Mini-NRC as a discussion tool to help align priorities with relevant community stakeholders. For example, LEAF and setting stakeholders worked together to align the priorities of creating healthy food environments and maintaining profitability. This was described by one setting stakeholder as the search for a “win-win”; he asked, “is there a way that we can be healthier and also make money?” (P12). By providing LEAF stakeholders with a reason to continually follow up with setting stakeholders, the Mini-NRC enabled LEAF stakeholders to learn about and respond to the barriers and challenges that the setting stakeholders faced in creating healthier food environments. The importance of aligning priorities was made clear by one LEAF project lead when she said,

But I think the challenge is just working with all the different partners... and knowing that healthy eating probably isn't their priority. It's certainly mine but not theirs. So, it's helping them recognize how those eating environments really do contribute, and can contribute, to their bottom line too (P8).

In some cases, policy enforcement helped to align priorities and ultimately led to food environment action. The role of policy enforcement in aligning priorities was particularly evident in the largest community, where it facilitated food environment action in a public building that had multiple food vendors. Here, momentum to create healthier food environments had been generated before LEAF, as decision-makers were beginning to require vendors to make changes in alignment with their nutrition policy. However, although policy enforcement was an enabler for change in this location, the setting stakeholder's perceived barriers to action were preventing further changes. Namely, the existence of competing food outlets within the facility was preventing change (i.e. competing priorities). In this case, the Mini-NRC served as a discussion tool to align priorities among multiple food outlets:

But again, our AHS facilities have that policy in place, and there's a lot more push to enforce it this year. So, they're feeling that pressure that they're going to have to move forward anyway. And our cafeteria had actually... previously already moved forward with renovating their menu... and so they've done really good things. But one of the things she (cafeteria stakeholder) identified as a barrier for her was they can't push too far with the vending because then they're in competition with the gift shop. So, if people don't like what's in the vending machines, the gift shop has all the junk. So now that we've addressed the gift shop, hopefully—from all of that snack food perspective—it's

going to be a little bit easier for both to align. So, trying to move all those little pieces together in a coordinated fashion (P8).

Available resources also helped to align priorities. Human resources, such as LEAF stakeholder time, was needed to learn and respond to the barriers that setting stakeholders faced in creating healthy food environments. Material resources were also beneficial to the process of aligning priorities. This was made clear in one community that received a grant to help create healthy food environments within their recreation facility. Here, the LEAF project lead described the success of experimentation offered by the grant, such as sampling healthy foods, as helping to align the setting stakeholder's priorities with providing healthy options. As explained by one LEAF project lead, "she (recreation stakeholder) was a little bit reluctant at first. She was willing to try, but she didn't think it would work. And she was really excited that offering these healthier choices has increased her business" (P25).

## **Summary of Results**

This chapter outlined the results pertaining to LEAF action and impacts. Analysis of LEAF stakeholder interviews revealed environmental and non-environmental impacts from LEAF. Non-environmental impacts are represented through the overarching theme opening doors and continuing conversations. Categories within this theme represented participants' main understandings of the purposes of using the Mini-NRC (gaining buy-in and guiding action) and the ways that they used their Mini-NRCs (raising awareness, framing conversations, and aligning priorities). Further, analysis of LEAF stakeholder interviews revealed perceived barriers and facilitators to LEAF success and sustainability, including level of engagement, community priorities, controllability, policy enforcement, resources, and key champions.

## Chapter 6: Discussion

This research project explored the experiences with and impacts of local stakeholder engagement in the Local Environment Action on Food project. This chapter begins by separately reviewing the findings from each goal within the context of relevant literature. Next, findings from each goal are integrated to provide a robust discussion of the collective findings from this research project. Integration of findings provides insight into the intimate connection between local stakeholder experiences with the LEAF process and resulting LEAF impacts.

### Experiences With LEAF

Findings from this goal demonstrate that community engagement in collecting and reporting on local food environment data was productive for practice and has potential benefits for research. Analysis of the LEAF process revealed important implementation insights, including an increased understanding of the perceived strengths and weaknesses of the approach. Findings are presented in two main themes: *building and maintaining relationships* and *process factors*.

We found that relationship building was considered a vital but challenging component of the LEAF process. Others have noted the importance and difficulties of relationship building within the context of community-based interventions (Montemurro et al., 2014; Raine et al., 2010; Willems Van Dijk et al., 2015). For example, in their reflection on the Healthy Alberta Communities project, a community-based population health intervention for obesity and chronic disease prevention, Raine et al. (2010) described relationship building with local communities as a valuable but time-intensive process. We found that LEAF stakeholders built and maintained relationships during the LEAF process through three interconnected strategies: *treading lightly*, *engaging the right people*, and *reaching a consensus*. Taken together, these strategies provide



insight into the complexities and challenges of building and maintaining community relationships. Such challenges are best demonstrated through a closer examination of the category treading lightly. Based on the experiences with the Alberta NRC (Ferdinands et al., 2020), we expected that communities would have some concerns about the concept of grading. However, the weight that these concerns carried was much larger than expected. Further, this research provides insight into how communities can potentially mitigate these concerns. Mitigation strategies are represented by the subcategories *obtaining permission and incorporating requests*, *using sensitive language*, and *respecting what exists*. Collectively, findings from this theme suggest that a strengths-based approach to benchmarking local food environments could prove beneficial. Within Minkler and Wallerstein's (2012) typology of community organizing and community building, this strategy aligns with community building and capacity building consensus approaches over conflict approaches that focus on advocacy. This approach is consistent with best practices of community-based obesity prevention, which suggest careful framing of the problem to prevent stigmatization and victim-blaming (King et al., 2011). Although this guidance was referring to use of the terms "obese" and "obesity" within community-based prevention, our findings suggest that it applies to healthy eating and food environment work more generally. This is also supported by Vandevijvere and colleagues' (2019) formative assessment of a food environments feedback system in New Zealand, which found that participants preferred a positive reward system over one that adopted a blaming or shaming approach. Similar to the results of other community-based interventions (Amed et al., 2015; de Groot et al., 2010), we found that LEAF offered a platform for relationship building among interested community stakeholders. During LEAF meetings, stakeholders shared their

experiences and responded to each other's challenges with creating healthy food environments. At times, the LEAF process even sparked new partnerships between LEAF stakeholders.

We found that the LEAF process and relationship building were shaped by numerous process factors, including *community context*, *LEAF flexibility*, *changing players* and *communication*. One interesting finding was that changing players, or turnover in stakeholders involved in LEAF, created confusion about the LEAF process. Although it was expected that there would be minor confusion about the intricacies involved in the LEAF process, we did not expect stakeholders to believe that the LEAF research team at the university was responsible for creating report recommendations. This finding reinforced results from the communication category: continuous and effective communication between involved players is vital. In order to avoid such confusion and help create community ownership, we suggest that stakeholders leading participatory research or intervention approaches clearly communicate and reiterate important information, such as roles or expectations, at each stage of the process. The need for clearly established roles and regular communication is supported by findings from other community-based health promotion interventions (Amed et al., 2015; de Groot et al., 2010). Similar to our findings, Amed et al (2015) found that regular communication between involved parties enabled continuous knowledge exchange and promoted relationship building.

Collectively, findings from this chapter support the use of community engagement or participatory methods, such as citizen science, in food environment research and practice. Although citizen science has previously been used in food environment work (Chrisinger et al., 2018; Pomeroy et al., 2017; Sheats et al., 2017), the scope of topics addressed by these studies was vastly different: Chrisinger et al (2018) conducted a program evaluation of a healthy corner store initiative in Camden, New Jersey; Sheats et al (2017) explored food access in older adults

in North San Mateo, California; and Pomeroy et al (2017) described a one-day workshop focused exclusively on retail food environments in St. John's, Newfoundland and Labrador. To our knowledge, this is the first study to explore participants' experiences using a citizen science approach to benchmarking children's food environments. Results from this chapter also demonstrate that the LEAF process was flexible and modifiable to each community's needs, as the LEAF process was slightly different in each community (varying in timelines, steps, included indicators and settings, etc). This was an intentional aspect of LEAF's design, in light of numerous critiques regarding the lack of adaptability to community context that persists in many community-based health promotion interventions (McLaren et al., 2007; Merzel & D'Afflitti, 2003). Furthermore, themes resulting from this chapter provide further support for the need for intervention adaptability and for the importance of community context to intervention implementation: both the relationship-building process and the influential process factors varied widely across communities and required different strategies to effectively address them.

### **Impacts of LEAF**

Chapter 5 contributes to an increased understanding of how local action to promote healthy food environments can be created. Analysis of the data revealed that LEAF had both environmental and non-environmental impacts. Further, participants provided insight into the perceived barriers and facilitators that contribute to sustainable food environment action. Findings from this chapter are supported by and build on our team's experiences with Alberta NRC (Ferdinands et al., 2020).

Participants perceived *level of engagement, controllability, community priorities, policy enforcement, resources, and key champions* as barriers and facilitators to creating food environment action. Notably, these factors did not exist in isolation: they commonly acted

together to enable, restrict, and determine the possibilities for change. Many of the identified barriers and facilitators align with previous research on creating community-based change for healthier food environments (Naylor et al., 2015, 2010; Vandevijvere et al., 2019). For example, interviews conducted with change agents (i.e. decision-makers) in New Zealand revealed concerns about economic barriers, such as the cost of healthy options, and a lack of power due to non-local control (Vandevijvere et al., 2019). In contrast to our findings, after exploring the experiences of improving food environments in twelve prize-winning communities, Willems Van Dijk et al (2015) identified that measuring progress and using evidence effectively were common community challenges. Promisingly, LEAF may offer a means to actually overcome some of the barriers found in this research and in extant literature. In regard to the barriers found within this research, LEAF's effects are demonstrated through its non-environmental impacts (discussed below). LEAF's potential to overcome other barriers, such as measuring progress and using evidence effectively (Willems Van Dijk et al., 2015), is as follows. First, LEAF embeds evidence-informed strategies within the intervention framework, as communities are collecting data on and working towards achieving evidence-informed benchmarks of healthy food environments. Second, if repeated, the Mini-NRCs provide communities with a way of measuring incremental progress in a variety of areas and settings.

Participants reported environmental impacts from LEAF in all five food environments. However, most impacts occurred in the physical and communication environments, and only a few communities reported changes in their economic, social, and political environments. Furthermore, while communities attempted to create changes in a wide variety of settings, there was a lack of action reported in retail food environments. Notably, many of the reported impacts pertained to sharing resources, such as healthy eating posters. Further, participants commonly

characterized food environment changes as ongoing and incremental, as they reported on progress towards recommendations and plans for action. This is reflected in the use of the present tense (e.g. increasing) in our table of LEAF impacts (Table 6). While this could be interpreted as LEAF having limited environmental impacts, we argue that it provides support for Wallerstein and colleague's (2015) argument that "change is not time bound but requires long-term commitment to tackle 'wicked,' that is, intractable and multilayer social and health problems" (p. 286).

Beyond the environmental impacts, participants also reported non-environmental impacts of LEAF. Namely, LEAF created a context specific tool that communities could use to promote and support food environment action. This is represented by the overarching theme *opening doors and continuing conversations*, which encompasses the diverse ways that LEAF stakeholders used their Mini-NRCs. A diverse and adaptable tool was beneficial, given the different barriers and facilitators that influenced food environment action both within and between communities. Similar to the Alberta NRC (Ferdinands et al., 2020), results from this chapter suggest that the Mini-NRCs are a tool to raise awareness about the current status and impact of food environments on children's eating behaviours. Typically, raising awareness was viewed as the first step for gaining buy-in and guiding action. These findings align with the broader health promotion literature: Rissel and Bracht (1999) highlight community readiness and community awareness as prerequisites to creating goals and strategies for local action. One interesting finding was that the report card provided guidance for action in a way that was not prescriptive. This was apparent during interviews, as some participants struggled to answer the question "have any recommendations been achieved," but had less difficulty providing information about "changes related to their Mini-NRC." Although this finding was initially surprising, it became

less so when we considered Potvin's (2017) argument that "health promotion interventions are conceived as being constantly created and recreated through their adaptation to local conditions" (p. 368). Therefore, this finding reinforced the need for an approach that was modifiable, even after it was "implemented" within the community.

## **Synthesis of Findings**

Integrating understandings of the experiences with and impacts of LEAF highlights connections between the two chapters and provides insight for creating, implementing, and evaluating future community-based health promotion interventions. Although each chapter has its own distinct themes and categories, at times there was overlap between them. Some overlap between findings was expected, as it is logical that a community's experience creating a Mini-NRC would influence its subsequent impact on food environment action. The overlap in findings is best demonstrated by examining the importance of community relationships. Community relationships were vital to both the LEAF process and LEAF impact, which is represented by the themes *building and maintaining relationships* and *opening doors and continuing conversations* respectively. The importance of positive community relationships to local food environment actions has been noted by others: Willems Van Dijk et al. (2015) identify "working together," or a collaborative strategy involving multiple sectors, as an important component for food environment action in all communities included in their study. Unlike this research project, the most commonly expressed challenge by communities in their study was coordinating organizations to maximize action and minimize duplication. Evidence from this research suggests that LEAF may provide a solution to this challenge, as some participants reported using their Mini-NRC to track the progress of involved organizations or community stakeholders.

Furthermore, how the LEAF process unfolded in each community could have important implications for the usability and potential impact of the Mini-NRC. For example, by using strategies to tread lightly, each community attempted to create a product that could be used to engage community stakeholders in creating healthier food environments. If the Mini-NRC did not achieve the goal of treading lightly, and setting stakeholders became defensive or dismissed the results, they might be less likely to engage in food environment action. Support for this assertion can be found in one community, as a LEAF project lead believed that a school setting disengaged from the LEAF process and subsequent food environment action in fear of receiving poor grades. Further, how communities choose to create their Mini-NRC likely influences how they choose to use it: anonymizing data may increase their likelihood to use a broader dissemination strategy, such as posting their Mini-NRC online. Another connection between experiences with the LEAF process and resulting LEAF impacts relates to the level of community engagement. As mentioned above, levels of community engagement in the LEAF process varied widely among involved communities. At times, this led to communities undertaking strategies found within chapter 5 (e.g. aligning priorities) during the LEAF process. As a result, higher levels of community engagement in the LEAF process may have enabled communities to report more environmental impacts at the time of interview, including reporting that some impacts occurred during the LEAF process. For example, two communities that described extensive community engagement during the LEAF process also reported the most environmental impacts from LEAF. However, this might have been influenced by the high number of interview participants from these communities compared to other communities in the sample.

Integration of findings can also provide insight into the relevance of community-level indicators. The fact that most changes occurred within the physical and communication environments may suggest that provincial indicators from the physical environment are perceived by LEAF stakeholders as more relevant or actionable at the community level. Support for this assertion can be found by examining the indicators chosen for each Mini-NRC. Although the Alberta NRC has only six indicators for the physical environment, all of these were chosen by at least one community. In comparison, although the Alberta NRC has eight indicators for the economic environment, only three were chosen by at least one community in the sample. On average, communities included five physical environment indicators and 2.43 economic indicators in their Mini-NRCs. Further support can be found within the category *perceived controllability*: as explained by one participant, “some of the indicators were probably lower priority just because they weren’t really within our capacity. Like food skills in middle schools. That’s a curriculum and a funding issue. And so, things that we really didn’t have a lot of control over, we probably focused on far less.”

## **Summary**

This chapter reviewed findings from the research project’s two main goals (LEAF process and action) within the context of relevant literature. Further, by integrating the findings from each goal, it provided insight into the connection between local stakeholder experiences with the LEAF process and resulting LEAF impacts.



## **Chapter 7: Conclusion**

Findings from this research support the use of community engagement in both food environment assessments and health promotion interventions. Through the development of a context specific tool that could be used to engage community stakeholders (i.e. the Mini-NRC), we found that the Local Environment Action on Food (LEAF) project was perceived to be a stimulus or support for change towards the creation of healthy food environments. Overall, participants provided positive feedback for the approach and reported both environmental and non-environmental impacts from LEAF. Their experiences revealed the importance of relationships to LEAF and provided insight into strategies that could aid in relationship building. Further, they provided insights into the barriers and facilitators that often acted together to enable, restrict, and determine the possibilities for change towards healthy food environments at the community level.

### **Strengths**

A major strength of this research was that data were collected and analyzed concurrently. Within each community, this allowed me to adapt the interview guide and explore unanticipated findings from earlier interviews with subsequent participants. Between communities, this enabled me to dive deeper into unexpected or underdeveloped categories. Another strength of this research project was the inclusion of multiple diverse LEAF communities. This allowed for a more in-depth examination of LEAF than if only a single community was selected, as it enabled comparison of similarities and differences between communities. Additionally, analyzing experiences with and impacts of LEAF across communities helped generate a greater understanding of contextual factors that acted as barriers or facilitators to LEAF success, as it highlighted the specific conditions in which certain findings occurred. As such, findings of this

research may apply to other LEAF communities. Furthermore, although there is increasing availability of tools and resources to measure and evaluate processes of community engagement and capacity, Wallerstein et al. (2015) argue that qualitative methods are needed to holistically capture community-level processes and outcomes. Thus, a final strength of this research was the use of qualitative methods to build an understanding of the nuances and contextual factors that influence the LEAF process and impacts.

### **Limitations**

This research project has several limitations. First, although supplementary data were used to contextualize findings from participant interviews, these findings largely represent the views of individuals involved in the first seven LEAF communities that agreed to participate in this research project. It is possible that other LEAF stakeholders had different or opposing experiences with and perceptions of LEAF. Second, this research is limited by a small sample size within each community due to the limited number of potential participants to draw from. As discussed in the results above, there was a high level of turnover among LEAF stakeholders. This created recruitment difficulties, as contact information for LEAF stakeholders changed, and few individuals had knowledge pertaining to all aspects of LEAF. However, the resulting sample for each community included at least one LEAF project lead. These individuals were considered to be key informants, as they could provide detailed information about the LEAF process and impacts. To mitigate the effects of turnover and achieve a larger and more diverse sample, it may be beneficial to conduct a short questionnaire at multiple points during and after the LEAF process. Questionnaires could also help gain a broader understanding of LEAF impacts: multiple participants reported not knowing the full extent of LEAF impacts, as they had limited capacity to follow up with all involved settings. Finally, environmental impacts (Table 6) from this

research are self-reported and were not verified by the research team or evaluated for their effectiveness. Although outside verification and evaluation might prove beneficial, it was outside the scope of this thesis project.

## **Implications and Recommendations**

### ***Research***

This research addressed a number of gaps in the literature. While the importance of creating and implementing programs and policies that change the collective determinants of eating behaviour is clear, *how* to achieve this goal remains unclear. Further, although there has been recent public support for action to create healthier food environments in Canada (Bhawra et al., 2018; Kongats et al., 2019), more pressure from the general public is critical to create successful food programs and policies. Findings from this research suggest that community engagement in benchmarking local food environments could provide an effective method to build public awareness, demand, and action towards healthier food environments at the community level. This aligns with the broader health promotion literature, as local engagement in community analysis has been described as a method to raise local awareness, ownership, and commitment for action (Rissel & Bracht, 1999). We found that community engagement facilitated the process of benchmarking local food environments, as LEAF stakeholders utilized their pre-existing community relationships to create their Mini-NRC. Pre-existing trusting community relationships were advantageous, given that others have described relationship building between outside researchers and community members to be a lengthy and challenging process (Raine et al., 2010). However, given the novelty of this intervention, additional research is warranted to determine its effectiveness. Although the use of qualitative methods was a strength of this research, we suggest that future research integrate quantitative methods to more robustly

measure the short, medium, and long-term effects of benchmarking local food environments. Short surveys or questionnaires administered during and after the LEAF process might provide additional insight into the experiences and impacts of benchmarking local food environments. Another potential way to examine the impact of LEAF could be through a longitudinal analysis of communities' Mini-NRCs in search of changes to grades. Of course, this would depend on communities' interest and ability to re-create their Mini-NRC at a later date. Further, although this research project included a sample of diverse communities, the range in community population was relatively narrow (~1000-60,000 people). Future research should be conducted to better understand the feasibility and nuances of benchmarking food environments in larger communities. This approach should also be piloted in other provinces, as all communities in this sample shared a similar provincial political and social context. If deemed successful, this approach could be applied to communities across Canada.

Previous research has also highlighted the problematic use of solely clinical indicators, such as BMI, to measure the success of community-based interventions that attempt to create environmental and policy changes (Lytvyak et al., 2016; Raine et al., 2013). One of LEAF's goals was to create community-level indicators that could be used to track and monitor smaller scale progress towards the creation of healthier food environments. Results from this research suggest that some indicators from the provincial (Alberta) NRC, particularly those within the physical environment, are applicable to the community level. However, findings also suggest that more work is required to create community-level indicators that highlight important areas of action, particularly within the economic and political environments.

Finally, although associations between aspects of food environments and individuals' diet-related outcomes have been demonstrated in the Canadian context, food environment research is

still young, and a clear and comprehensive understanding of the Canadian food environment is lacking (Health Canada, 2013). Findings from this research suggest that LEAF bears potential to advance food environment research and generate a more holistic picture of Alberta's, or even Canada's, food environments. Further, it could address some of the identified barriers to creating a provincial NRC. Namely, if results from the Mini-NRCs were integrated into the Alberta NRC, it could address the struggle to "capture nuances at the local community level" (Ferdinands et al., 2020, p. 9).

### ***Practice***

Findings from this research have several implications for practice. First, as LEAF continues to be implemented in new communities, the results from this research provide important considerations for LEAF communities and the LEAF research team. Relationship building and the strategies that comprise it played a key role in determining the LEAF process and impacts. Therefore, communities should take time to consider the relationships that are vital to food environment action within their context and strive to strengthen these connections. Further, communities should consider the use of a strengths-based approach to benchmarking food environments, given that it fits with the goals of their Mini-NRC. Second, using a citizen science approach to benchmarking local food environments had positive implications for community members interested in creating healthy food environments. This work fit within the organizational goals of many LEAF project leads, as they often held positions as public health dietitians. Participants often commented on the need for sustainable food environment efforts in order to see meaningful progress. For some, this included re-creating their Mini-NRC in the future as a way of measuring their actions. While some participants had ideas about how this could be done without research support, it is unlikely that the current methodology for creating a

Mini-NRC would be possible without the support and resources of the LEAF research team. We recommend the creation of a web application to aid communities in carrying out independent food environment assessments. Further, we suggest the creation of a communication platform or network for communities to share challenges and successes relevant to creating healthy food environments. This could allow communities to more effectively respond to the numerous challenges that prevent the creation of healthy local food environments.

### ***Policy***

Findings from this research have several implications for policy. First, in order to promote the sustainability of food environment work, we suggest that the process of benchmarking food environments becomes embedded within the job description of community dietitians or other relevant health professionals. As mentioned in the results, participants often felt that LEAF fit within the scope of their job and sometimes even enhanced their regular work. As explained by one participant,

And then I think what I've heard from all of the ones (public health dietitians) that have gotten to the kind of sharing the results, is that they all felt like this is one of the most impactful pieces of work they've done... From the perspective of really engaging the community and getting people all working together around healthy eating environments. That's not always a hot seller, right. And so, this has been really good to get that sort of work spring boarded.

We believe that embedding the LEAF process within the roles of relevant health professionals would provide a tool for those best positioned to use it. For example, health professionals, such as public health dietitians, could help address some of the perceived barriers to creating healthy food environments that were found by this research, including a lack of resources and competing

priorities. Second, we suggest the availability of dedicated financial and human resources for creating and monitoring local food policies. Given that policy influencers have been described as “the ultimate gatekeepers of healthy public policy” (Kongats et al., 2019, p. 1501), we suggest that this includes dedicated financial resources allotted for policy influencers to participate in community-based projects such as LEAF. These recommendations are supported by the findings from this research. First, we found that resources, particularly financial resources, influenced a community’s perceived ability to create and monitor local food environment policies. Second, although many participants expressed wanting engagement from policy influencers in LEAF, at times they struggled to achieve this. The positive impact of policy influencer engagement in LEAF was especially clear in one community. As expressed by the LEAF project lead, “I mean, to have a champion like the city councillor on our group is like, okay, we can move mountains... You know, somebody at a much higher level can move things that those of us at lower levels can’t.”<sup>1</sup>

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<sup>1</sup> However, due to budget cuts, the city councillor mentioned in this quote was forced to step down from several community committees which was likely to include ending her involvement in LEAF.

## References

- Afshin, A., Sur, P. J., Fay, K. A., Cornaby, L., Ferrara, G., Salama, J. S., Mullany, E. C., Abate, K. H., Abbafati, C., Abebe, Z., Afarideh, M., Aggarwal, A., Agrawal, S., Akinyemiju, T., Alahdab, F., Bacha, U., Bachman, V. F., Badali, H., Badawi, A., ... Murray, C. J. L. (2019). Health effects of dietary risks in 195 countries, 1990–2017: A systematic analysis for the Global Burden of Disease Study 2017. *The Lancet*, *393*(10184), 1958–1972.  
[https://doi.org/10.1016/S0140-6736\(19\)30041-8](https://doi.org/10.1016/S0140-6736(19)30041-8)
- Alberta Health Services. (n.d.). *Alberta Health Services zone map*. Retrieved June 30, 2020, from <https://www.albertahealthservices.ca/assets/zone/ahs-map-ahs-zones.pdf>
- Amed, S., Naylor, P. J., Pinkney, S., Shea, S., Mâsse, L. C., Berg, S., Collet, J. P., & Wharf Higgins, J. (2015). Creating a collective impact on childhood obesity: Lessons from the SCOPE initiative. *Canadian Journal of Public Health*, *106*(6), e426–e433.  
<https://doi.org/10.17269/CJPH.106.5114>
- Baxter, P., & Jack, S. (2008). Qualitative case study methodology: Study design and implementation for novice researchers. *The Qualitative Report*, *13*(4), 544–559.  
<https://nsuworks.nova.edu/tqr/vol13/iss4/2/>
- Benchmarking Food Environments Team. (2019). *Alberta's 2019 nutrition report card on food environments for children and youth*.  
<https://abpolicycoalitionforprevention.ca/evidence/albertas-nutrition-report-card/>
- Bhawra, J., Reid, J. L., White, C. M., Vanderlee, L., Raine, K., & Hammond, D. (2018). Are young Canadians supportive of proposed nutrition policies and regulations? An overview of policy support and the impact of socio-demographic factors on public opinion. *Canadian*



- Journal of Public Health*, 109(4), 498–505. <https://doi.org/10.17269/s41997-018-0066-1>
- Bleich, S. N., Segal, J., Wu, Y., Wilson, R., & Wang, Y. (2013). Systematic review of community-based childhood obesity prevention studies. *Pediatrics*, 132(1), e201-210. <https://doi.org/10.1542/peds.2013-0886>
- Boelsen-Robinson, T., Peeters, A., Beauchamp, A., Chung, A., Gearon, E., & Backholer, K. (2015). A systematic review of the effectiveness of whole-of-community interventions by socioeconomic position. *Obesity Reviews*, 16(9), 806–816. <https://doi.org/10.1111/obr.12297>
- Bowen, G. A. (2009). Document Analysis as a Qualitative Research Method. *Qualitative Research Journal*, 9(2), 27–40. <https://doi.org/10.3316/qrj0902027>
- Brennan, L., Castro, S., Brownson, R. C., Claus, J., & Orleans, C. T. (2011). Accelerating evidence reviews and broadening evidence standards to identify effective, promising, and emerging policy and environmental strategies for prevention of childhood obesity. *Annual Review of Public Health*, 32, 199–223. <https://doi.org/10.1146/annurev-publhealth-031210-101206>
- Breslow, L. (1996). Social ecological strategies for promoting healthy lifestyles. *American Journal of Health Promotion*, 10(4), 253–257. <https://doi.org/10.4278/0890-1171-10.4.253>
- Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Harvard University Press.
- Brunton, G., Thomas, J., O'Mara-Eves, A., Jamal, F., Oliver, S., & Kavanagh, J. (2017). Narratives of community engagement: A systematic review-derived conceptual framework

for public health interventions. *BMC Public Health*, 17, 1–15.

<https://doi.org/10.1186/s12889-017-4958-4>

Bryman, A., & Bell, E. (2016). *Social research methods* (4th ed.). Oxford University Press.

Campbell, N. R. C., & Greene Raine, N. (2019). The Child Health Protection Act: Advocacy must continue. *Canadian Medical Association Journal*, 191(38), E1040–E1041.

<https://doi.org/10.1503/cmaj.190857>

Canadian Institutes of Health Research, Natural Sciences and Engineering Research Council of Canada, & Social Sciences and Humanities Research Council of Canada. (2018). *Tri-council policy statement: Ethical conduct for research involving humans*.

<https://ethics.gc.ca/eng/documents/tcps2-2018-en-interactive-final.pdf>

Centers for Disease Control and Prevention. (n.d.). *Childhood nutrition facts*. Retrieved July 4, 2020, from <https://www.cdc.gov/healthyschools/nutrition/facts.htm>

Charmaz, K. (2014). *Constructing grounded theory* (2nd ed.). Sage Publications.

Chmiliar, L. (2012). Multiple-case designs. In A. J. Mills, G. Durepos, & E. Wiebe (Eds.), *Encyclopedia of Case Study Research* (pp. 583–584). SAGE Publications, Inc.

<https://doi.org/10.4135/9781412957397>

Chrisinger, B. W., Ramos, A., Shaykis, F., Martinez, T., Banchoff, A. W., Winter, S. J., & King, A. C. (2018). Leveraging citizen science for healthier food environments: A pilot study to evaluate corner stores in Camden, New Jersey. *Frontiers in Public Health*, 6.

<https://doi.org/10.3389/fpubh.2018.00089>

Clinical and Translational Science Awards Consortium Community Engagement Key Function

- Committee Task Force on the Principles of Community Engagement. (2011). *Principles of community engagement*. [https://ncats.nih.gov/ctsa\\_2011/ch5\\_v2.html](https://ncats.nih.gov/ctsa_2011/ch5_v2.html)
- Contento, I. (2008). Nutrition education: Linking research, theory, and practice. *Asia Pacific Journal of Clinical Nutrition*, 17(1), 176–179.
- de Groot, F. P., Robertson, N. M., Swinburn, B. A., & de Silva-Sanigorski, A. M. (2010). Increasing community capacity to prevent childhood obesity: Challenges, lessons learned and results from the Romp & Chomp intervention. *BMC Public Health*, 10. <https://doi.org/10.1186/1471-2458-10-522>
- Diepeveen, S., Ling, T., Suhrcke, M., Roland, M., & Marteau, T. M. (2013). Public acceptability of government intervention to change health-related behaviours: A systematic review and narrative synthesis. *BMC Public Health*, 13. <https://doi.org/http://dx.doi.org.login.ezproxy.library.ualberta.ca/10.1186/1471-2458-13-756>
- Ewart-Pierce, E., Mejía Ruiz, M. J., & Gittelsohn, J. (2016). “Whole-of-community” obesity prevention: A review of challenges and opportunities in multilevel, multicomponent interventions. *Current Obesity Reports*, 5(3), 361–374. <https://doi.org/10.1007/s13679-016-0226-7>
- Ferdinands, A. R., Olstad, D. L., Milford, K. M., Maximova, K., Nykiforuk, C. I. J., & Raine, K. D. (2020). A Nutrition Report Card on food environments for children and youth: 5 years of experience from Canada. *Public Health Nutrition*, 1–12. <https://doi.org/10.1017/S1368980020000130>
- Frohlich, K. L. (2014). Commentary: What is a population-based intervention? Returning to

geoffrey rose. *International Journal of Epidemiology*, 43(4), 1292–1293.

<https://doi.org/10.1093/ije/dyu111>

Government of Canada. (2010). *Curbing childhood obesity: A Federal, Provincial and Territorial Framework for action to promote healthy weight.*

<https://www.canada.ca/content/dam/phac-aspc/migration/phac-aspc/hp-ps/hl-mvs/framework-cadre/pdf/ccofw-eng.pdf>

Government of Canada. (2019a). *Canada's food guide.* <https://food-guide.canada.ca/en/>

Government of Canada. (2019b). *Health Canada's healthy eating strategy.*

<https://www.canada.ca/en/services/health/campaigns/vision-healthy-canada/healthy-eating.html>

Government of Canada. (2019c). *Prepare meals and snacks using healthy ingredients.* Canada's Food Guide. <https://food-guide.canada.ca/en/healthy-eating-recommendations/limit-highly-processed-foods/prepare-meals-and-snacks-using-healthy-ingredients/>

Green, L. W., Richard, L., & Potvin, L. (1996). Ecological foundations of health promotion.

*American Journal of Health Promotion*, 10(4), 270–281. <https://doi.org/10.4278/0890-1171-10.4.270>

Hawe, P., Shiell, A., & Riley, T. (2009). Theorising interventions as events in systems. *American*

*Journal of Community Psychology*, 43, 267–276. [https://doi.org/10.1007/s10464-009-9229-](https://doi.org/10.1007/s10464-009-9229-9)

9

Health Canada. (2012). *Guidance for the food industry on reducing sodium in processed foods.*

<https://www.canada.ca/content/dam/hc-sc/migration/hc-sc/fn->

an/alt\_formats/pdf/legislation/guide-ld/2012-sodium-reduction-indust-eng.pdf

Health Canada. (2013). *Measuring the food environment in Canada*. [www.hc-sc.gc.ca/fn-an/nutrition/pol/index-eng.php](http://www.hc-sc.gc.ca/fn-an/nutrition/pol/index-eng.php)

Health Canada. (2016). *Healthy eating strategy*.

<https://www.canada.ca/content/dam/canada/health-canada/migration/publications/eating-nutrition/healthy-eating-strategy-canada-strategie-saine-alimentation/alt/pub-eng.pdf>

Health Canada. (2018a). *Canada's tobacco strategy*. <https://www.canada.ca/content/dam/hc-sc/documents/services/publications/healthy-living/canada-tobacco-strategy/overview-canada-tobacco-strategy-eng.pdf>

Health Canada. (2018b). *Sodium intake of Canadians in 2017*.

<https://www.canada.ca/content/dam/hc-sc/documents/services/publications/food-nutrition/sodium-intake-canadians-2017/2017-sodium-intakes-report-eng.pdf>

Health Canada. (2018c). *Sodium reduction in processed foods in Canada: An evaluation of progress toward voluntary targets from 2012 to 2016*.

<https://www.canada.ca/content/dam/hc-sc/documents/services/food-nutrition/legislation-guidelines/guidance-documents/guidance-food-industry-reducing-sodium-processed-foods-progress-report-2017/pub1-eng.pdf>

Health Canada. (2019). *Canada's dietary guidelines for health professionals and policy makers*.

<https://food-guide.canada.ca/static/assets/pdf/CDG-EN-2018.pdf>

Herman, K. M., Craig, C. L., Gauvin, L., & Katzmarzyk, P. T. (2009). Tracking of obesity and physical activity from childhood to adulthood: The Physical Activity Longitudinal Study.

*International Journal of Pediatric Obesity*, 4, 281–288.

<https://doi.org/10.3109/17477160802596171>

Institute for Health Metrics and Evaluation. (2017). *GBD compare data visualization*.

<https://vizhub.healthdata.org/gbd-compare/>

Institute of Medicine. (2012). Community-based prevention. In *An Integrated Framework for Assessing the Value of Community-Based Prevention* (pp. 23–60). National Academies Press. <https://doi.org/https://doi.org/10.17226/13487>

Joffres, M. R., Campbell, N. R. C., Manns, B., & Tu, K. (2007). Estimate of the benefits of a population-based reduction in dietary sodium additives on hypertension and its related health care costs in Canada. *Canadian Journal of Cardiology*, 23(6), 437–443.

[https://doi.org/10.1016/S0828-282X\(07\)70780-8](https://doi.org/10.1016/S0828-282X(07)70780-8)

King, L., Gill, T., Allender, S., & Swinburn, B. (2011). Best practice principles for community-based obesity prevention: Development, content and application. *Obesity Reviews*, 12(5), 329–338. <https://doi.org/10.1111/j.1467-789X.2010.00798.x>

Kongats, K., McGetrick, J. A., Raine, K. D., Voyer, C., & Nykiforuk, C. I. J. (2019). Assessing general public and policy influencer support for healthy public policies to promote healthy eating at the population level in two Canadian provinces. *Public Health Nutrition*, 22(8), 1492–1502. <https://doi.org/10.1017/S1368980018004068>

Laverack, G. (2014). *A-z of health promotion*. Palgrave Macmillan.

LeCompete, M. D., & Preissle, J. (2003). *Ethnography and qualitative design in educational research* (2nd ed.). Academic Press.

- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Sage Publications.
- Lytvyak, E., Olstad, D. L., Schopflocher, D. P., Plotnikoff, R. C., Storey, K. E., Nykiforuk, C. I. J., & Raine, K. D. (2016). Impact of a 3-year multi-centre community-based intervention on risk factors for chronic disease and obesity among free-living adults: The Healthy Alberta Communities study. *BMC Public Health*, *16*. <https://doi.org/10.1186/s12889-016-3021-1>
- Martin, J., Peeters, A., Honisett, S., Mavoa, H., Swinburn, B., & De Silva-Sanigorski, A. (2014). Benchmarking government action for obesity prevention—An innovative advocacy strategy. *Obesity Research and Clinical Practice*, *8*(4), e388–e398. <https://doi.org/10.1016/j.orcp.2013.07.001>
- Mayan, M. J. (2016). *Essentials of qualitative inquiry*. Routledge.
- McLaren, L., Ghali, L. M., Lorenzetti, D., & Rock, M. (2007). Out of context? Translating evidence from the North Karelia project over place and time. *Health Education Research*, *22*(3), 414–424. <https://doi.org/10.1093/her/cyl097>
- McLaren, L., & Hawe, P. (2005). Ecological perspectives in health research. *Journal of Epidemiology and Community Health*, *59*, 6–14. <https://doi.org/10.1136/jech.2003.018044>
- McLeroy, K., Norton, B. L., Kegler, M. C., Burdine, J. N., & Sumaya, C. V. (2003). Community-based interventions. *American Journal of Public Health*, *93*(4), 529–533. <https://doi.org/https://doi.org/10.2105/AJPH.93.4.529>
- McLeroy, K. R., Bibeau, D., Steckler, A., & Glanz, K. (1988). Ecological perspective on health promotion programs. *Health Education Quarterly*, *15*(4), 351–377. <https://doi.org/https://doi.org/10.1177/109019818801500401>

- Merriam, S. B. (1988). *Case study research in education: A qualitative approach*. Jossey-Bass.
- Merzel, C., & D’Afflitti, J. (2003). Reconsidering community-based health promotion: Promise, performance, and potential. *American Journal of Public Health, 93*(4), 557–574.  
<https://doi.org/10.2105/AJPH.93.4.557>
- Mikkilä, V., Räsänen, L., Raitakari, O. T., Pietinen, P., & Viikari, J. (2005). Consistent dietary patterns identified from childhood to adulthood: The cardiovascular risk in Young Finns Study. *British Journal of Nutrition, 93*, 923–931. <https://doi.org/10.1079/BJN20051418>
- Minaker, L. M. (2016). Retail food environments in Canada: Maximizing the impact of research, policy and practice. *Canadian Journal of Public Health, 107*(Suppl. 1), eS1–eS3.  
<https://doi.org/10.17269/CJPH.107.5632>
- Minaker, L. M., Shuh, A., Olstad, D. L., Engler-Stringer, R., Black, J. L., & Mah, C. L. (2016). Retail food environments research in Canada: A scoping review. *Canadian Journal of Public Health, 107*(Suppl. 1), eS4–eS13. <https://doi.org/10.17269/CJPH.107.5344>
- Minkler, M., & Wallerstein, N. (2012). Improving health through community organization and community building: Perspectives from health education and social work. In M. Minkler (Ed.), *Community organizing and community building for health and welfare* (3rd ed., pp. 37–58). Rutgers University Press.
- Montemurro, G. R., Raine, K. D., Nykiforuk, C. I. J., & Mayan, M. (2014). Exploring the process of capacity-building among community-based health promotion workers in Alberta, Canada. *Health Promotion International, 29*(3), 463–473.  
<https://doi.org/10.1093/heapro/dat008>



- Moore, G. F., Audrey, S., Barker, M., Bond, L., Bonell, C., Hardeman, W., Moore, L., O’Cathain, A., Tinati, T., Wight, D., & Baird, J. (2015). Process evaluation of complex interventions: Medical Research Council guidance. *BMJ*, *350*(h1258).  
<https://doi.org/10.1136/bmj.h1258>
- Morse, J. M. (1999). The armchair walkthrough. *Qualitative Health Research*, *9*(4), 435–436.
- Morse, J. M., Barrett, M., Mayan, M., Olson, K., & Spiers, J. (2002). Verification strategies for establishing reliability and validity in qualitative research. *International Journal of Qualitative Methods*, *1*(2), 13–22. <https://doi.org/10.1177/160940690200100202>
- Movassagh, E. Z., Baxter-Jones, A. D. G., Kontulainen, S., Whiting, S. J., & Vatanparast, H. (2017). Tracking dietary patterns over 20 years from childhood through adolescence into young adulthood: The Saskatchewan Pediatric Bone Mineral Accrual Study. *Nutrients*, *9*(9), 990. <https://doi.org/10.3390/nu9090990>
- Naylor, P. J., Olstad, D. L., & Therrien, S. (2015). An intervention to enhance the food environment in public recreation and sport settings: A natural experiment in British Columbia, Canada. *Childhood Obesity*, *11*(4), 364–374.  
<https://doi.org/10.1089/chi.2014.0148>
- Naylor, P. J., Wekken, S. Vander, Trill, D., & Kirbyson, A. (2010). Facilitating healthier food environments in public recreation facilities: Results of a pilot project in British Columbia, Canada. *Journal of Park and Recreation Administration*, *28*(4), 37–58.
- O’Mara-Eves, A., Brunton, G., McDaid, D., Oliver, S., Kavanagh, J., Jamal, F., Matosevic, T., Harden, A., & Thomas, J. (2013). Community engagement to reduce inequalities in health: a systematic review, meta-analysis and economic analysis. In *Public Health Research* (Vol.

1, Issue 4). <https://doi.org/10.3310/phr01040>

Olstad, D. L., Campbell, N. R. C., & Raine, K. D. (2019). Diet quality in Canada: Policy solutions for equity. *Canadian Medical Association Journal*, *191*(4), E100–E102. <https://doi.org/10.1503/cmaj.180938>

Olstad, D. L., Raine, K. D., & Nykiforuk, C. I. J. (2014). Development of a report card on healthy food environments and nutrition for children in Canada. *Preventive Medicine*, *69*, 287–295. <https://doi.org/10.1016/j.ypmed.2014.10.023>

Pan-Canadian Public Health Network. (2017). *Towards a healthier Canada- 2017 progress report on advancing the federal/provincial/territorial framework on healthy weights*. <http://www.phn-rsp.ca/thcpr-vcpsre-2017/index-eng.php>

Pomeroy, S. J., Minaker, L. M., & Mah, C. L. (2017). An exploration of citizen science for population health research in retail food environments. *Canadian Journal of Public Health*, *108*(5–6), e636–e638. <https://doi.org/10.17269/cjph.108.6099>

Popkin, B., Monteiro, C., & Swinburn, B. (2013). Overview: Bellagio conference on program and policy options for preventing obesity in the low- and middle-income countries. *Obesity Reviews*, *14*(Suppl. 2), 1–8. <https://doi.org/10.1111/obr.12108>

Potvin, L. (2017). Developing a health promotion research agenda: Learning from population health interventions research. In I. Rootman, A. Pederson, K. L. Frohlich, & S. Dupere (Eds.), *Health promotion in Canada: new perspectives on theory, practice, policy, and research* (Fourth). Canadian Scholars.

Power, E. M. (2005). Determinants of healthy eating among low-income Canadians. *Canadian*

*Journal of Public Health*, 96, S37–S42. <https://doi.org/10.1007/BF03405200>

Public Health Agency of Canada. (2005). *The integrated pan-Canadian healthy living strategy*.

<https://www.phac-aspc.gc.ca/hp-ps/hl-mvs/ipchls-spimmvs/pdf/ipchls-spimmvs-eng.pdf>

Raine, K. D. (2005). Determinants of healthy eating in Canada: An overview and synthesis.

*Canadian Journal of Public Health*, 96(Suppl. 3), S8–S14.

<https://doi.org/10.1007/BF03405195>

Raine, K. D., Plotnikoff, R., Nykiforuk, C., Deegan, H., Hemphill, E., Storey, K., Schopflocher,

D., Veugelers, P., Wild, T. C., & Ohinmaa, A. (2010). Reflections on community-based

population health intervention and evaluation for obesity and chronic disease prevention:

The Healthy Alberta Communities project. *International Journal of Public Health*, 55(6),

679–686. <https://doi.org/10.1007/s00038-010-0187-7>

Raine, K. D., Plotnikoff, R., Schopflocher, D., Lytvyak, E., Nykiforuk, C. I. J., Storey, K.,

Ohinmaa, A., Purdy, L., Veugelers, P., & Wild, T. C. (2013). Healthy Alberta communities:

Impact of a three-year community-based obesity and chronic disease prevention

intervention. *Preventive Medicine*, 57(6), 955–962.

<https://doi.org/10.1016/j.ypmed.2013.08.024>

Richard, L., & Gauvin, L. (2017). Building and implementing ecological health promotion

interventions. In Irving Rootman, A. Pederson, K. L. Frohlich, & S. Dupere (Eds.), *Health*

*promotion in Canada: New perspectives on theory, practice, policy, and research* (4th ed.,

pp. 84–99). Canadian Scholars.

Richards, H. M., & Schwartz, L. J. (2002). Ethics of qualitative research: Are there special issues

for health services research? *Family Practice*, 19(2), 135–139.

[http://ovidsp.ovid.com/login.ezproxy.library.ualberta.ca/ovidweb.cgi?T=JS&PAGE=fulltext  
&D=ovft&CSC=Y&NEWS=N&SEARCH=00003856-200204000-00004.an](http://ovidsp.ovid.com/login.ezproxy.library.ualberta.ca/ovidweb.cgi?T=JS&PAGE=fulltext&D=ovft&CSC=Y&NEWS=N&SEARCH=00003856-200204000-00004.an)

Rideout, K., Mah, C. L., & Minaker, L. (2015). *Food environments: An introduction for public health practice*.

[http://www.nceh.ca/sites/default/files/Food\\_Environments\\_Public\\_Health\\_Practice\\_Dec\\_2015.pdf](http://www.nceh.ca/sites/default/files/Food_Environments_Public_Health_Practice_Dec_2015.pdf)

Rissel, C., & Bracht, N. (1999). Assessing community needs, resources, and readiness: Building on strengths. In N. Bracht (Ed.), *Health promotion at the community level: New advances* (2nd ed., pp. 59–71). SAGE Publications Inc.

Rose, G. (1985). Sick individuals and sick populations. *International Journal of Epidemiology*, *14*(1), 32–38. <https://doi.org/10.1093/ije/30.3.427>

Saldaña, J. (2016). *The coding manual for qualitative researchers* (J. Seaman (ed.); 3rd ed.). SAGE Publications Ltd.

Sallis, J. F., & Owen, N. (2015). Ecological models of health behavior. In K. Glanz, B. K. Rimer, & K. Viswanath (Eds.), *Health behavior: Theory, research, and practice* (5th ed., pp. 43–64). Jossey-Bass.

Sheats, J. L., Winter, S. J., Romero, P. P., & King, A. C. (2017). FEAST: Empowering community residents to use technology to assess and advocate for healthy food environments. *Journal of Urban Health*, *94*(2), 180–189. <https://doi.org/10.1007/s11524-017-0141-6>

Silver, D. (2010). A brief history of community-based health interventions. In S. Guttmacher, P.

- J. Kelly, & Y. Ruiz-Janecko (Eds.), *Community-based health interventions: Principles and applications* (pp. 11–24). Jossey-Bass.
- Simons, H. (2012). Evolution and concept of case study research. In *Case study research in practice* (pp. 12–27). SAGE Publications Ltd. <https://doi.org/10.4135/9781446268322.n1>
- Singh, A. S., Mulder, C., Twisk, J. W. R., Van Mechelen, W., & Chinapaw, M. J. M. (2008). Tracking of childhood overweight into adulthood: A systematic review of the literature. *Obesity Reviews*, 9(5), 474–488. <https://doi.org/10.1111/j.1467-789X.2008.00475.x>
- Sodium Working Group. (2010). *Sodium reduction strategy for Canada. Recommendations of the Sodium Working Group*. <https://www.canada.ca/en/health-canada/services/food-nutrition/healthy-eating/sodium/related-information/reduction-strategy/recommendations-sodium-working-group.html>
- Stake, R. E. (1995). *The art of case study research*. Sage Publications.
- Statistics Canada. (2017a). *Census profile, 2016 census*. <https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E>
- Statistics Canada. (2017b). *Population centre and rural area classification 2016*. <https://www.statcan.gc.ca/eng/subjects/standard/pcrac/2016/introduction>
- Stokols, D. (1992). Establishing and maintaining healthy environments: Toward a social ecology of health promotion. *American Psychologist*, 47(1), 6–22. <https://doi.org/10.1037//0003-066x.47.1.6>.
- Stokols, D. (1996). Translating social ecological theory into guidelines for community health promotion. *American Journal of Health Promotion*, 10(4), 282–298.

<https://doi.org/10.4278/0890-1171-10.4.282>

- Swinburn, B., Egger, G., & Raza, F. (1999). Dissecting obesogenic environments: The development and application of a framework for identifying and prioritizing environmental interventions for obesity. *Preventive Medicine, 29*(6 Pt 1), 563–570.
- Swinburn, B., Sacks, G., Vandevijvere, S., Kumanyika, S., Lobstein, T., Neal, B., Barquera, S., Friel, S., Hawkes, C., Kelly, B., L'Abbé, M., Lee, A., Ma, J., Macmullan, J., Mohan, S., Monteiro, C., Rayner, M., Sanders, D., Snowdon, W., & Walker, C. (2013). INFORMAS (International Network for Food and Obesity/non-communicable diseases Research, Monitoring and Action Support): Overview and key principles. *Obesity Reviews, 14*(Suppl. 1), 1–12. <https://doi.org/10.1111/obr.12087>
- Swinburn, B., Vandevijvere, S., Kraak, V., Sacks, G., Snowdon, W., Hawkes, C., Barquera, S., Friel, S., Kelly, B., Kumanyika, S., L'Abbé, M., Lee, A., Lobstein, T., Ma, J., Macmullan, J., Mohan, S., Monteiro, C., Neal, B., Rayner, M., ... Walker, C. (2013). Monitoring and benchmarking government policies and actions to improve the healthiness of food environments: A proposed government healthy food environment policy index. *Obesity Reviews, 14*(Suppl. 1), 24–37. <https://doi.org/10.1111/obr.12073>
- Taylor, J. P., Evers, S., & McKenna, M. (2005). Determinants of healthy eating in children and youth. *Canadian Journal of Public Health, 96*(Suppl. 3), S20–S26. <https://www-jstor-org.login.ezproxy.library.ualberta.ca/stable/41994468>
- Thompson, B., & Kinne, S. (1999). Social change theory: Applications to community health. In N. Bracht (Ed.), *Health promotion at the community level: New advances* (2nd ed., pp. 29–46). SAGE Publications Inc.

- Trickett, E. J. (2019). Ecology, wicked problems, and the context of community interventions. *Health Education and Behavior, 46*(2), 204–212.  
<https://doi.org/10.1177/1090198119828795>
- Vanderlee, L., Goorang, S., Karbasy, K., Schermel, A., & L'Abbé, M. (2017). *Creating healthier food environments in Canada: Current policies and priority actions*.  
[https://labbelab.utoronto.ca/wp-content/uploads/2017/12/FoodEPI\\_Summary\\_Report\\_WEB-Final.pdf](https://labbelab.utoronto.ca/wp-content/uploads/2017/12/FoodEPI_Summary_Report_WEB-Final.pdf)
- Vandevijvere, S., Williams, R., Tawfiq, E., & Swinburn, B. (2019). A food environments feedback system (FoodBack) for empowering citizens and change agents to create healthier community food places. *Health Promotion International, 34*(2), 277–290.  
<https://doi.org/10.1093/heapro/dax079>
- Wallerstein, N., Minkler, M., Carter-Edwards, L., Avila, M., & Sanchez, V. (2015). Improving health through community engagement, community organization, and community building. In K. Glanz, B. K. Rimer, & K. Viswanath (Eds.), *Health behavior: Theory, research, and practice* (5th ed., pp. 277–300). Jossey-Bass A Wiley Brand.
- Waters, E., Bj, B., Brown, T., Kj, C., Gao, Y., Armstrong, R., & Prosser, L. (2011). Interventions for preventing obesity in children. *Cochrane Database of Systematic Reviews, 12*.  
<https://doi.org/10.1002/14651858.CD001871.pub3.www.cochranelibrary.com>
- Willems Van Dijk, J. A., Catlin, B., Cofsky, A., & Carroll, C. (2015). Challenges and lessons learned from communities using evidence to adopt strategies to improve healthy food environments. *Health Affairs, 34*(11), 1979–1985. <https://doi.org/10.1377/hlthaff.2015.0643>
- Wolfenden, L., Wyse, R., Nichols, M., Allender, S., Millar, L., & McElduff, P. (2014). A

systematic review and meta-analysis of whole of community interventions to prevent excessive population weight gain. *Preventive Medicine*, 62, 193–200.

<https://doi.org/10.1016/j.ypmed.2014.01.031>

World Health Organization. (1986). *The Ottawa Charter for Health Promotion*.

<https://www.who.int/healthpromotion/conferences/previous/ottawa/en/>

World Health Organization. (2007). *A guide for population-based approaches to increasing levels of physical activity: Implementation of the WHO global strategy on diet, physical activity and health*. <https://www.who.int/dietphysicalactivity/physical-activity-promotion-2007.pdf>

World Health Organization. (2009). *Interventions on diet and physical activity: What works: summary report*.

[https://apps.who.int/iris/bitstream/handle/10665/44140/9789241598248\\_eng.pdf;jsessionid=CB91E7C0D1154FACD3A5858E0D69F40A?sequence=1](https://apps.who.int/iris/bitstream/handle/10665/44140/9789241598248_eng.pdf;jsessionid=CB91E7C0D1154FACD3A5858E0D69F40A?sequence=1)

World Health Organization. (2012). *Population-based approaches to childhood obesity prevention*.

[https://www.who.int/dietphysicalactivity/childhood/WHO\\_new\\_childhoodobesity\\_PREVENTION\\_27nov\\_HR\\_PRINT\\_OK.pdf](https://www.who.int/dietphysicalactivity/childhood/WHO_new_childhoodobesity_PREVENTION_27nov_HR_PRINT_OK.pdf)

World Health Organization. (2016). Report of the commission on ending childhood obesity. In *World Health Organization*. [https://doi.org/ISBN 978 92 4 151006 6](https://doi.org/ISBN%20978%2092%204%20151006%206)

World Health Organization. (2018). *Malnutrition*. <https://www.who.int/news-room/factsheets/detail/malnutrition>



Yin, R. K. (2003). *Case study research: Design and methods* (3rd ed.). Sage Publications.

## Appendix A. The LEAF Team and Corresponding Roles in the Research Project

Overall Project Team		Role in Research Project
LEAF Research Team	Dr. Kim Raine	Provided guidance and support for the direction and execution of the research project.
	Krista Milford	
	Breanne Aylward	Primarily responsible for this research project and directly involved with conducting the research.
Organizational Partners	Alberta Health Services	Provided access to participants and could aid in disseminating research findings.
	Alberta Healthy Communities	
Community Partners	Community A	Communities that underwent LEAF and were included in the sample for this research project. They are the setting where the organizational and individual partners operate and could provide a location for end-of-grant KT activities.
	Community B	
	Community C	
	Community D	
	Community E	
	Community F	
Individual Partners	Health practitioners and policymakers that work for the organizational partners.	Some of the individual partners that were involved in LEAF in sampled communities served as participants. They were also included as partners in the larger BFE project (helping to shape this research project's approach and will provide assistance in end-of-grant KT).
	Individuals holding leadership and decision-making roles in health organizations, such as Alberta Healthy Communities and Alberta Health Services.	

## **Appendix B. Consent for Release of Contact Information**

**Title of the Project** Impact of Local Environment Action on Food: Key Informant Interviews

### **Research Investigators**

Dr. Kim Raine , 4-077 ECHA, 11405 – 87 Ave, Edmonton, Alberta, Canada T6G 1C9, Tel. 780.492.9415, Email: kim.raine@ualberta.ca

Dr. Candace Nykiforuk, 3-291 ECHA, 11405 – 87 Ave, Edmonton, Alberta, Canada T6G 1C9 , Tel.780.492.4109, Email: candace.nykiforuk@ualberta.ca

Dr. Katerina Maximova, 3-268 ECHA, 11405 – 87 Ave, Edmonton, Alberta, Canada T6G 1C9, Tel. 780.248.2076, Email: katerina.maximova@ualberta.ca

Dr. Dana Olstad, 3E16, 3280 Hospital Drive NW Calgary, AB T2N 4Z6, Tel. 403.210.8673, Email: dana.olstad@ucalgary.ca

This form is for you to provide consent for a member of the study team to contact you to tell you more about the research study and see if you might be interested in taking part.

### **Study Summary**

The Local Environment Action on Food project works with communities to do environmental scans (Mini Nutrition Report Cards) in settings (e.g. school, cafeterias, childcare centres, rec centres, etc.) where children eat and rate how healthy the food choices are, as well as how current policies and actions may act as barriers or facilitators to positive change, with the goal of finding ways to make healthy eating easier. Concerned community members and health professionals are asked to do the environmental scan by collecting this food information and with our team co-create recommendations for making healthy eating easier. The finished product comprised of a written report and a community info-graphic is presented back to the community.

We have worked together with you and your team of community members to complete the Mini Nutrition Report Card for your community and at this time, we are inviting all interested community members and professionals that engaged in this process and related meetings and teleconferences to be interviewed by telephone to share your experiences.

**Completing this form does not provide consent to participate in the study. You do not need to provide your contact information at all.**

**CONSENT:**

**By signing this consent, I give permission to the study team to contact me in order to give me more information about this study and to be asked to participate in the study.**

Name: \_\_\_\_\_

Phone number: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Person obtaining consent:

Name: \_\_\_\_\_ Signature: \_\_\_\_\_

Date: \_\_\_\_\_

## Appendix C. Consent for Release of Documents

### INFORMATION LETTER

**Title of the Project**                      Impact of Local Environment Action on Food project: Community Engagement Process

#### Research Investigators

Dr. Kim Raine , 4-077 ECHA, 11405 – 87 Ave, Edmonton, Alberta, Canada T6G 1C9, Tel. 780.492.9415, Email: [kim.raine@ualberta.ca](mailto:kim.raine@ualberta.ca)

Dr. Candace Nykiforuk, 3-291 ECHA, 11405 – 87 Ave, Edmonton, Alberta, Canada T6G 1C9 , Tel.780.492.4109, Email: [candace.nykiforuk@ualberta.ca](mailto:candace.nykiforuk@ualberta.ca)

Dr. Katerina Maximova, 3-268 ECHA, 11405 – 87 Ave, Edmonton, Alberta, Canada T6G 1C9, Tel. 780.248.2076, Email: [katerina.maximova@ualberta.ca](mailto:katerina.maximova@ualberta.ca)

Dr. Dana Olstad, 3E16, 3280 Hospital Drive NW Calgary, AB T2N 4Z6, Tel. 403.210.8673, Email: [dana.olstad@ucalgary.ca](mailto:dana.olstad@ucalgary.ca)

#### Background

Increasingly, new evidence reveals how food environments shape the availability, affordability, and social acceptability of food and nutrition choices, and demonstrating associations between food environments and diet-related outcomes. At the School of Public Health, our research team wants to find ways to prevent cancer through healthy eating by working with communities to identify opportunities to improve food environments.

The Local Environment Action on Food project works with communities to do environmental scans in settings (e.g. school, cafeterias, childcare centres, rec centres, etc.) where children eat and rate how healthy the food choices are, as well as how current policies and actions may act as barriers or facilitators to positive change, with the goal of finding ways to make healthy eating easier. Concerned community members and health professionals are asked to do the environmental scan by collecting this food information and with our team co-create recommendations for making healthy eating easier. The project coordinator provides communities a two-hour orientation to assist in the environmental scan. Following this, two 30-minute teleconference meetings between the research team and the community help to clarify the environmental scan information collected, then co-create recommendations to make healthier eating easier. The finished product comprised of a written report and a community info-graphic is presented back to the community.

**Purpose**

This Information Letter/Consent Form is pertaining to the notes arising from the aforementioned meetings and teleconferences regarding the environmental scan. These notes are compiled by the project coordinator and then typed into electronic files. The intention is to use the notes for research purposes to facilitate understanding of the process of the environmental scan on food environments, which may be a valuable contribution to our knowledge about making community-based change in food environments.

**Study Procedures**

We are asking for your permission to use the notes from the aforementioned meetings and teleconferences.

**Benefits**

There is no direct benefit to you from the research team using the notes from meetings for research purposes. We truly appreciate the time you give in these meetings and teleconferences.

**Risks**

No known risks.

**Confidentiality**

Any names or identifying information will not be recorded in the minutes and notes from meetings and teleconferences. The data will be kept in secured storage cabinets and on secured servers in the School of Public Health at the University of Alberta. The data will be kept for the duration of the project till Fall 2021 and for 5 years following. After that time the files will be deleted. The only individuals that will have access to this data will be the principal investigator (Dr. Kim Raine) and her supervised staff and students.

**Voluntary Participation/ Freedom to Withdraw**

Participation in meetings and teleconferences is completely voluntary; therefore, you may choose not to attend meetings and teleconferences. Following meetings and teleconferences the notes cannot be withdrawn.

### **Future Use of the Data**

We will report findings at conferences, or in published material, your name will not appear in any report.

### **Additional contacts**

The plan for this study has been reviewed by a Research Ethics Board at the University of Alberta. If you have questions about your rights or how research should be conducted, you can call (780) 492-2615. This office is independent of the researchers.

## CONSENT FORM

**Title of the Project**                      Impact of Local Environment Action on Food

### Research Investigators

Dr. Kim Raine, 4-077 ECHA, 11405 – 87 Ave, Edmonton, Alberta, Canada T6G 1C9, Tel. 780.492.9415, Email: [kim.raine@ualberta.ca](mailto:kim.raine@ualberta.ca)

Dr. Candace Nykiforuk, 3-291 ECHA, 11405 – 87 Ave, Edmonton, Alberta, Canada T6G 1C9, Tel.780.492.4109, Email: [candace.nykiforuk@ualberta.ca](mailto:candace.nykiforuk@ualberta.ca)

Dr. Katerina Maximova, 3-268 ECHA, 11405 – 87 Ave, Edmonton, Alberta, Canada T6G 1C9, Tel. 780.248.2076, Email: [katerina.maximova@ualberta.ca](mailto:katerina.maximova@ualberta.ca)

Dr. Dana Olstad, 3E16, 3280 Hospital Drive NW Calgary, AB T2N 4Z6, Tel. 403.210.8673, Email: [dana.olsstad@ucalgary.ca](mailto:dana.olsstad@ucalgary.ca)

### Consent Statement

I have read this form and the research study has been explained to me. I have been given the opportunity to ask questions and my questions have been answered. If I have additional questions, I have been told whom to contact. I agree to participate in the research study described above and will receive a copy of this consent form. I will receive a copy of this consent form after I sign it.

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<b>Participant's Name (printed) and Signature</b>	<b>Date</b>
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<b>Name (printed) and Signature of Person Obtaining Consent</b>	<b>Date</b>
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## **Appendix D. Consent to Participate**

### **INFORMATION LETTER**

**Title of the Project** Impact of Local Environment Action on Food: Key Informant Interviews

#### **Research Investigators**

Dr. Kim Raine , 4-077 ECHA, 11405 – 87 Ave, Edmonton, Alberta, Canada T6G 1C9, Tel. 780.492.9415, Email: [kim.raine@ualberta.ca](mailto:kim.raine@ualberta.ca)

Dr. Candace Nykiforuk, 3-291 ECHA, 11405 – 87 Ave, Edmonton, Alberta, Canada T6G 1C9 , Tel.780.492.4109, Email: [candace.nykiforuk@ualberta.ca](mailto:candace.nykiforuk@ualberta.ca)

Dr. Katerina Maximova, 3-268 ECHA, 11405 – 87 Ave, Edmonton, Alberta, Canada T6G 1C9, Tel. 780.248.2076, Email: [katerina.maximova@ualberta.ca](mailto:katerina.maximova@ualberta.ca)

Dr. Dana Olstad, 3E16, [3280 Hospital Drive NW Calgary, AB T2N 4Z6](https://www.google.com/maps/place/3280+Hospital+Drive+NW+Calgary,+AB+T2N+4Z6), Tel. 403.210.8673, Email: [dana.olstad@ucalgary.ca](mailto:dana.olstad@ucalgary.ca)

#### **Background**

Increasingly, new evidence reveals how food environments shape the availability, affordability, and social acceptability of food and nutrition choices, and demonstrating associations between food environments and diet-related outcomes. At the School of Public Health, our research team wants to find ways to prevent cancer through healthy eating by working with communities to identify opportunities to improve food environments.

The Local Environment Action on Food project works with communities to do environmental scans in settings (e.g. school, cafeterias, childcare centres, rec centres, etc.) where children eat and rate how healthy the food choices are, as well as how current policies and actions may act as barriers or facilitators to positive change, with the goal of finding ways to make healthy eating easier. Concerned community members and health professionals are asked to do the environmental scan by collecting this food information and with our team co-create recommendations for making healthy eating easier. The project coordinator provides communities a two-hour orientation to assist in the environmental scan. Following this, two 30-minute teleconference meetings between the research team and the community help to clarify the environmental scan information collected, then co-create recommendations to make healthier eating easier. The finished product comprised of a written report and a community info-graphic is presented back to the community.

You are asked to be in this study because you have collaborated in the environmental scan, and attended meetings and teleconferences. We want to learn about your experience collecting local level data/reporting on food-related policies and any impacts from this.

#### **Purpose**

This Information Letter/Consent Form is asking you to participate in a telephone interview with the project coordinator or research assistant. The intention is to use the transcript from the telephone interview for research purposes to facilitate understanding of the process of the

environmental scan on food environments, which may be a valuable contribution to our knowledge about making community-based change in food environments.

### **Study Procedures**

Once you have provided consent for a member of the study team to contact you, either the Research Project Coordinator, Krista Milford, or the Research Assistant, Breanne Aylward, will contact you to see if you would like to share your experiences in a telephone interview (30 minutes to 1 hour in length). The telephone interview will be at a time that is convenient for your schedule.

### **Benefits**

We truly appreciate the time you will give to help us further understand the process, impact, and outcomes of the environmental scan on food environments, which may be a valuable contribution to our knowledge about making community-based change in food environments. At the end of the interview, you will be mailed a small gift card in the amount of \$25.00 to show our appreciation.

### **Risks**

No known risks.

### **Confidentiality**

Any names or identifying information will be removed; therefore, the resulting transcripts will only have numbers instead of actual names. The data will be kept in secured storage cabinets and on secured servers in the School of Public Health at the University of Alberta. The only individuals that will have access to this data will be the principal investigator (Dr. Kim Raine) and her supervised staff and students. If you would like a copy of the research findings, please let us know following the interview.

### **Voluntary Participation/ Freedom to Withdraw**

Participation is completely voluntary, you may choose not to answer any question or end the interview at any point. If you wish to withdraw your data from the study, please indicate this at the end of the interview. After that point, there will not be an opportunity to withdraw your data.

### **Future Use of the Data**

We will report findings at conferences, or in published material, your name will not appear in any report.

### **Additional contacts**

The plan for this study has been reviewed by a Research Ethics Board at the University of Alberta. If you have questions about your rights or how research should be conducted, you can call (780) 492-2615. This office is independent of the researchers.

If you are interested in taking part in this study, please contact Krista Milford at 780-492-5911 or by email at [krista.milford@ualberta.ca](mailto:krista.milford@ualberta.ca) at your earliest convenience to arrange an interview. The following Consent Form is to be signed, scanned and emailed to Krista prior to the interview.

## CONSENT FORM

**Title of the Project** Impact of Local Environment Action on Food: Key Informant Interviews

### Research Investigators

Dr. Kim Raine , 4-077 ECHA, 11405 – 87 Ave, Edmonton, Alberta, Canada T6G 1C9, Tel. 780.492.9415, Email: [kim.raine@ualberta.ca](mailto:kim.raine@ualberta.ca)

Dr. Candace Nykiforuk, 3-291 ECHA, 11405 – 87 Ave, Edmonton, Alberta, Canada T6G 1C9 , Tel.780.492.4109, Email: [candace.nykiforuk@ualberta.ca](mailto:candace.nykiforuk@ualberta.ca)

Dr. Katerina Maximova, 3-268 ECHA, 11405 – 87 Ave, Edmonton, Alberta, Canada T6G 1C9, Tel. 780.248.2076, Email: [katerina.maximova@ualberta.ca](mailto:katerina.maximova@ualberta.ca)

Dr. Dana Olstad, 3E16, [3280 Hospital Drive NW Calgary, AB T2N 4Z6](#), Tel. 403.210.8673, Email: [dana.olstad@ucalgary.ca](mailto:dana.olstad@ucalgary.ca)

### Consent Statement

I have read this form and the research study has been explained to me. I have been given the opportunity to ask questions and my questions have been answered. If I have additional questions, I have been told whom to contact. I agree to participate in the research study described above and will receive a copy of this consent form. I will receive a copy of this consent form after I sign it.

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**Participant's Name (printed) and Signature**

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**Date**

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**Name (printed) and Signature**

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**Date**

## Appendix E. LEAF Stakeholder Interview Guide

A. Topic Area: The process and perceived utility of collecting local level data/reporting on food-related policies:

1. Question: Can you tell us about your experience collecting Indicator Data?

a. Probes:

1. What helped?
2. What hindered?
3. Where did you go?
4. What did you do?
5. Who did you engage?
6. Did you ever have any fears of infringing on people's privacy?
7. How did you find the online tool/orientation?
8. Were there hindrances with the online tool?

2. Question: After you collected the Indicator Data, please tell us about your experience in interpreting the data and then coming up with recommendations.

a. Probes:

1. Did you engage other community members in coming up with recommendations?
2. How did you prioritize what you were going to recommend?
3. How did you determine what was practical and relevant to your community?

B. Topic Area: Examples of the impact of Mini NRC/local Indicator Data Collection on food environments, eating behavior/overweight and obesity of children & youth

3. Question: Reflecting on the whole process: collecting, analyzing, creating recommendations, has this affected the culture in the community? If so, how?

a. Probes:

1. How did you get from making the recommendations to encouraging action?
2. Have any recommendations been taken up?
3. If yes, which ones and how did it happen?

4. Have you experienced any push back from local vendors, rec facilities or schools?

C. Topic Area: Insights into taking action for policy change - Assess appetite/palatability for change

4. Question: Have any local food environments changed as a result of the Mini Nutrition Report Card?

a. Probe: What enabled that impact to happen?

5. Question: Do you know of people we could talk to from this community who can tell us how this has played out for them in the community?