

Julia Gerritsen - Discovery Snapshot



**CATAMOUNT**

FELLOWSHIP FOR EMERGING CHANGEMAKERS

# Food Insecurity in Calgary Communities

How might we improve access to healthy and affordable food in Calgary communities?

Catamount Fellow  
Julia Gerritsen,  
Bachelor of Nursing (4th year)

Community Partner  
Jocelyn Herbert,  
Leftovers Foundation

Faculty Mentor  
Heather Nelson, PhD

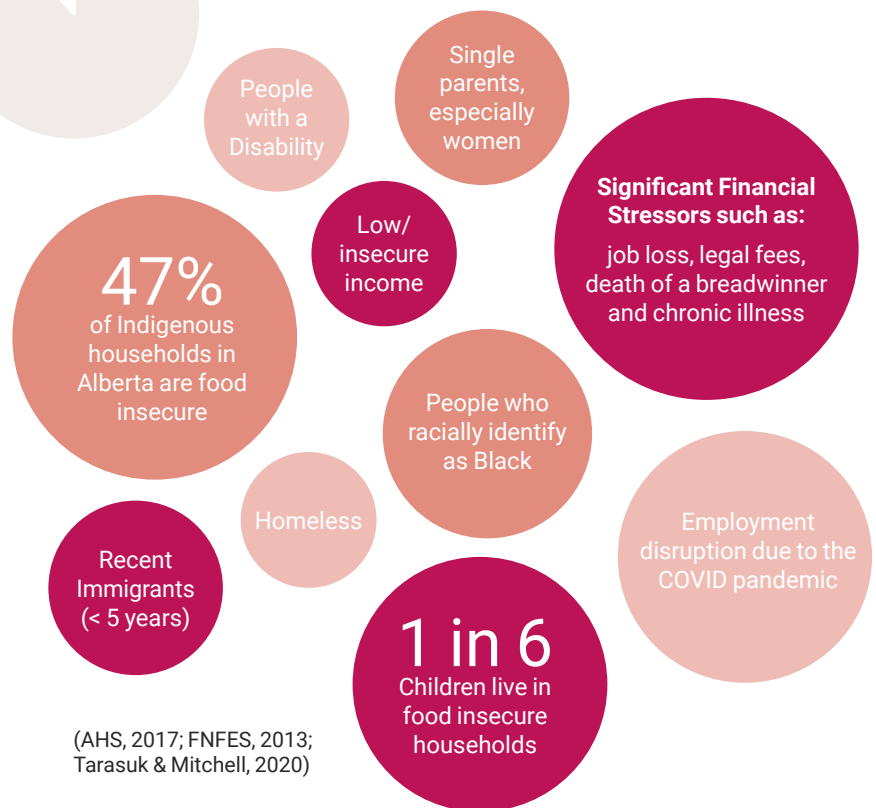
**11.6%**  
of Calgarians Experience Food Insecurity

## Problem Definition

Access to food is not only a basic need, but a universal human right. A balanced diet is integral to the maintenance of a healthy lifestyle; however, as a society we have been unsuccessful at ensuring Canadians consistently have enough to eat. Statistics from the Household Food Security Survey Module (HFSSM) in 2017-2018 show that 12.7% of Canadian households experience food insecurity and that 4.4 million Canadians are going hungry (Tarasuk & Mitchell, 2020). The data indicates 12.9% of households in Alberta are food-insecure (Tarasuk & Mitchell, 2020) and 11.6% of Calgarians experience food insecurity (Tarasuk & Mitchell, 2020), suggesting a substantial need for local action. Food insecurity is most prevalent in populations that experience a low socioeconomic status, especially those living on low and insecure incomes (Tarasuk & Mitchell, 2020).

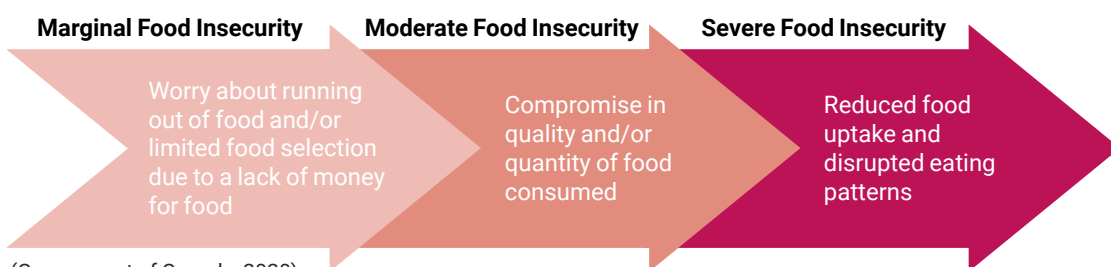


## Risk Factors for Food Insecurity



## Methodology

The research focuses on food insecurity and hunger in the context of Calgary communities and highlights health intersections. Secondary research in the form of academic and non-academic sources provides qualitative and quantitative data and is used alongside community-engaged learning to recognize barriers and uncover potential areas for sustainable action. The findings are guided by insights gained from a community conversation hosted during the Catamount Fellowship, which included participation by individuals and stakeholders within the food security system in Calgary.



(Government of Canada, 2020)



## Health Impacts



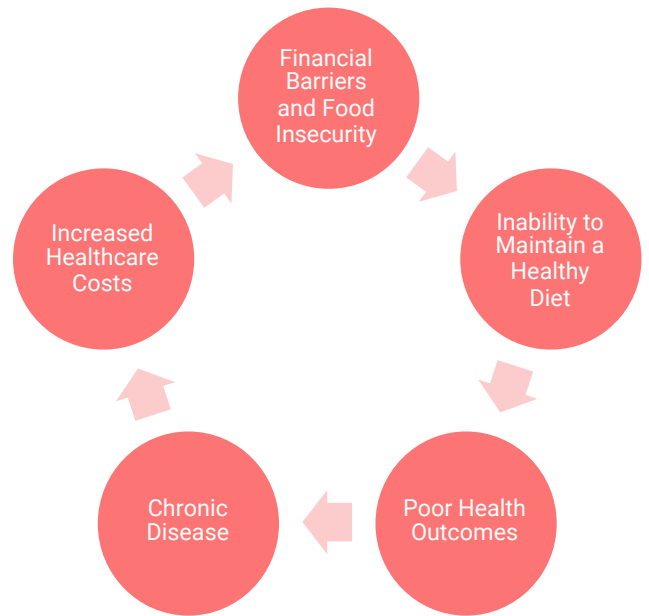
Prolonged food insecurity can place adults at risk for chronic illness including **hypertension, diabetes,** (Seligman et al., 2010; AHS, 2017) **and cardiovascular disease** (Vercammen et al., 2019).



Individuals who experience food insecurity are more likely to **pass away at a significantly earlier age** than food secure individuals (Men et al., 2020, p. 57-58).



Mental illness, including **depressive episodes, anxiety disorders, and suicidal thoughts** are more prevalent in individuals who experience the stressor of food insecurity (Jessiman-Perreault & McIntyre, 2017).



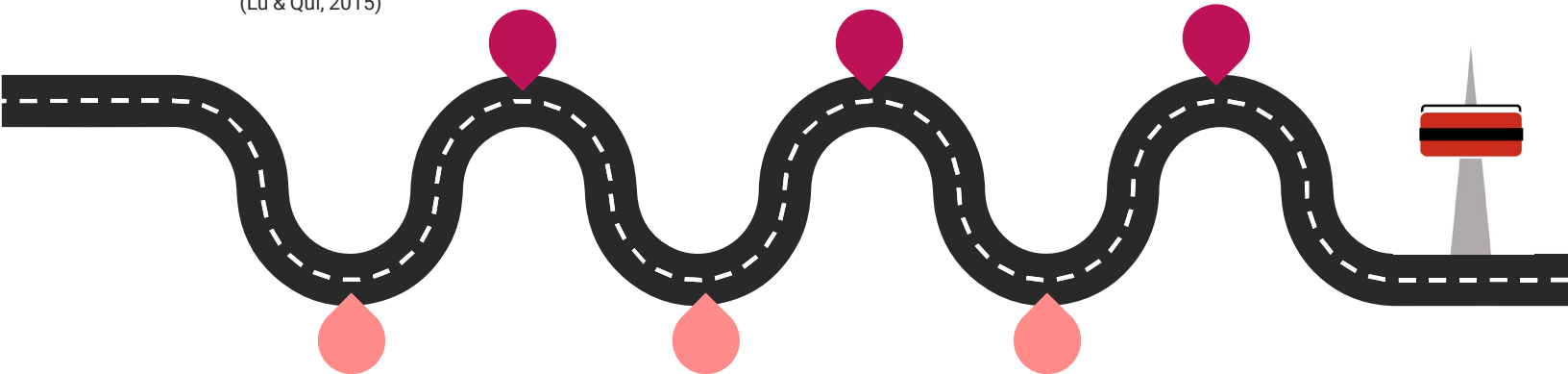
Chronic disease and food insecurity exist in a cyclical relationship, as many individuals with a chronic illness are vulnerable to becoming food insecure due to medication and treatment costs, reduced earnings and lack of energy to manage finances (AHS, 2017). Many people with chronic illness are unable to afford the specific diets and treatments encouraged by healthcare professionals, causing their health to deteriorate (AHS, 2017). Food insecurity results in significantly higher healthcare costs associated with emergency room visits, hospital and physician visits, home care, surgeries and prescription drugs (Tarasuk et al., 2015).

## Calgary's Barriers to Food Access

Competitive food retail market and quickly expanding suburban development results in neighborhoods that **lack accessible services** such as supermarkets (Lu & Qui, 2015)

Urban design does not support **walking or biking** to supermarkets (The Calgary Food Committee, 2012)

Lack of research on food landscapes in Calgary including **"food swamps"** and **"food mirages"**



Only 63% of Calgarians live within **2000 meters** of a grocery store (Lu & Qui, 2015)

Issues with the transit system include the lack of **routes, frequency, and storage for groceries** (The Calgary Food Committee, 2012)

**Cold weather** and hazards such as ice in winter months

### FOOD DESERT

exists when "geographic areas have limited access to healthy food," forcing people to rely on convenience stores and fast food (Chen & Gregg, 2017, p. 1)

### FOOD SWAMP

an area that has healthy retailers overpowered by a large number of unhealthy food options (Chen & Gregg, 2017, p. 1)

### FOOD MIRAGE

occurs when people with a low income are unable to afford the healthy options that are in their community (Chen & Gregg, 2017, p. 1)

## Findings and Recommendations

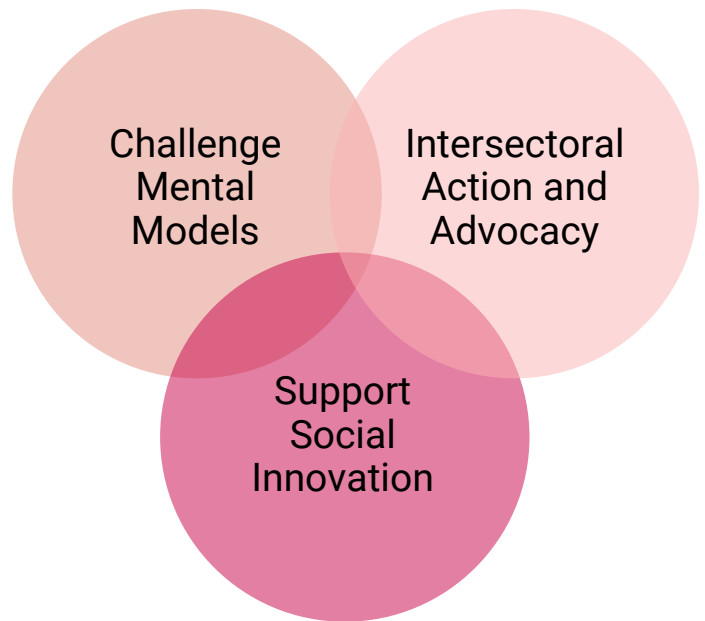
Food insecurity is a complex system that both exists within the larger food system and contains many smaller systems itself. Addressing food insecurity in Calgary communities through sustainable change is possible through challenging current mental models, encouraging intersectoral action and advocacy, and creating space to support new innovations.

Improving food security for Canadians involves **shifting underlying beliefs** about the solution to hunger and changing assumptions about people who are hungry. Although food banks provide over 5 million meals and snacks to hungry Canadians (Food Banks Canada, 2019), **food charity does little to address the root causes of food insecurity**. Food bank statistics significantly “understate the prevalence of food insecurity” (para. 3) and fail to capture changes over time (PROOF, 2016). Only a **small amount of the food insecure population turns to food charity** out of desperation, and these families **remain food insecure** despite accessing services (PROOF, 2016). The reliance on food banks as the only solution is problematic, and funders should be encouraged to participate in innovations that move away from the typical mental model of food charity.



There are multiple efforts in Calgary and other settings that are **exploring new ideas** and solutions to shift the food insecurity system toward sustainable change. However, these projects require a change in the mental models that are perpetuating food charity. Greater impact is possible through **increased support of innovations** within the solutions landscape.

Food insecurity exists within the greater system of poverty, which could be addressed by the implementation of **enhanced income supports**, potentially in the form of universal basic income or a similar intervention. Government funding that enables everyone to “meet their basic needs, participate in society and live with dignity, regardless of work status” (Pasma & Regehr, 2019, p. 5) would ensure that Canadians have financial access to healthy foods to maintain a balanced diet. **Increases in the Canada Child Benefit (CCB)** have been shown to significantly benefit food insecure households (Brown & Tarasuk, 2019). Even a small income supplement could **improve food security for Canadian families** with young children (Ionescu-Ittu et al., 2014).



## Examples Within the Solutions Landscape

COMMUNITY KITCHEN  
fresh routes  
AKI  
Community Gardens  
Pay What you Can Grocery Store



## References

- Alberta Health Services. (2017). Household food insecurity in Alberta: A backgrounder. <https://www.albertahealthservices.ca/assets/info/nutrition/if-nfs-household-food-insecurity-in-alberta.pdf>
- Alberta Health Services. (2017). The affordability of healthy eating in Alberta 2015. Available from <http://www.albertahealthservices.ca/assets/info/nutrition/if-nfs-affordability-of-healthy-eating.pdf>
- Brown, E., & Tarasuk, V. (2019). Money speaks: Reductions in severe food insecurity follow the Canada Child Benefit. *Preventive Medicine*, 129, 105876–105876. <https://doi.org/10.1016/j.ypmed.2019.105876>
- Chen, T., Gregg, E. (2017). Food deserts and food swamps: A primer. National Collaborating Center for Environmental Health. [https://www.nccch.ca/sites/default/files/Food\\_Deserts\\_Food\\_Swamps\\_Primer\\_Oct\\_2017.pdf](https://www.nccch.ca/sites/default/files/Food_Deserts_Food_Swamps_Primer_Oct_2017.pdf)
- First Nations Food, Nutrition and Environment Study. (2013). Summary of Results: Alberta. <http://www.fnfnes.ca/docs/ABsummaryofresultshmay2016.pdf>
- Government of Canada. (2020, February 18). Determining food security status. <https://www.canada.ca/en/health-canada/services/food-nutrition/food-nutrition-surveillance/health-nutrition-surveys/canadian-community-health-survey-cchs/household-food-insecurity-canada-overview/determining-food-security-status-food-nutrition-surveillance-health-canada.html#adult>
- Ionescu-Iltu, R., Glymour, M., & Kaufman, J. (2014). A difference-in-differences approach to estimate the effect of income-supplementation on food insecurity. *Preventive Medicine*, 70, 108–116. <https://doi.org/10.1016/j.ypmed.2014.11.017>
- Jessiman-Perreault, G., & McIntyre, L. (2017). The household food insecurity gradient and potential reductions in adverse population mental health outcomes in Canadian adults. *SSM - Population Health*, 3(C), 464–472. <https://doi.org/10.1016/j.ssmph.2017.05.013>
- Lu, W., & Qiu, F. (2015). Do food deserts exist in Calgary, Canada? *The Canadian Geographer*, 59(3), 267–282. <https://doi.org/10.1111/cag.12176>
- Martin, M., Maddocks, E., Chen, Y., Gilman, S., & Colman, I. (2016). Food insecurity and mental illness: disproportionate impacts in the context of perceived stress and social isolation. *Public Health (London)*, 132, 86–91. <https://doi.org/10.1016/j.puhe.2015.11.014>
- Men, F., Gundersen, C., Urquia, M., & Tarasuk, V. (2020). Association between household food insecurity and mortality in Canada: A population-based retrospective cohort study. *Canadian Medical Association Journal (CMAJ)*, 192(3), E53–E60. <https://doi.org/10.1503/cmaj.190385>
- Pasma, C., & Regehr, S. (2019). Basic income: Some policy options for Canada. Basic Income Canada Network. [https://d3n8a8pro7vhmx.cloudfront.net/bicn/pages/3725/attachments/original/1579707497/Basic\\_Income\\_Some\\_Policy\\_Options\\_for\\_Canada2.pdf?1579707497](https://d3n8a8pro7vhmx.cloudfront.net/bicn/pages/3725/attachments/original/1579707497/Basic_Income_Some_Policy_Options_for_Canada2.pdf?1579707497)
- PROOF Food Insecurity Policy Research. (2016, March 3). Food bank stats don't tell the story of food insecurity. <https://proof.utoronto.ca/food-bank-stats-dont-tell-the-story-of-food-insecurity/>
- Seligman, H., Laraia, B., & Kushel, M. (2010). Food Insecurity Is Associated with Chronic Disease among Low-Income NHANES Participants. *The Journal of Nutrition*, 140(2), 304–310. <https://doi.org/10.3945/jn.109.112573>
- Tarasuk, V., Cheng, J., de Oliveira, C., Dachner, N., Gundersen, C., & Kurdyak, P. (2015). Association between household food insecurity and annual health care costs. *Canadian Medical Association Journal (CMAJ)*, 187(14), E429–E436. <https://doi.org/10.1503/cmaj.150234>
- Tarasuk V, & Mitchell A. (2020) Household food insecurity in Canada, 2017-18. Toronto: Research to identify policy options to reduce food insecurity (PROOF). <https://proof.utoronto.ca/> <https://www.canada.ca/en/health-canada/services/food-nutrition/food-nutrition-surveillance/health-nutrition-surveys/canadian-community-health-survey-cchs/household-food-insecurity-canada-overview/determining-food-security-status-food-nutrition-surveillance-health-canada.html>
- The Calgary Food Committee. (2012). Calgary food system assessment & action plan. The City of Calgary. <https://www.calgary.ca/content/dam/www/pda/pd/documents/calgary-eats/calgaryeats-full-food-system-assessment-action-plan-for-calgary.pdf>
- Vercammen, K., Moran, A., McClain, A., Thorndike, A., Fulay, A., & Rimm, E. (2019). Food Security and 10-Year Cardiovascular Disease Risk Among U.S. Adults. *American Journal of Preventive Medicine*, 56(5), 689–697. <https://doi.org/10.1016/j.amepre.2018.11.016>

Julia Gerritsen - Creative Work

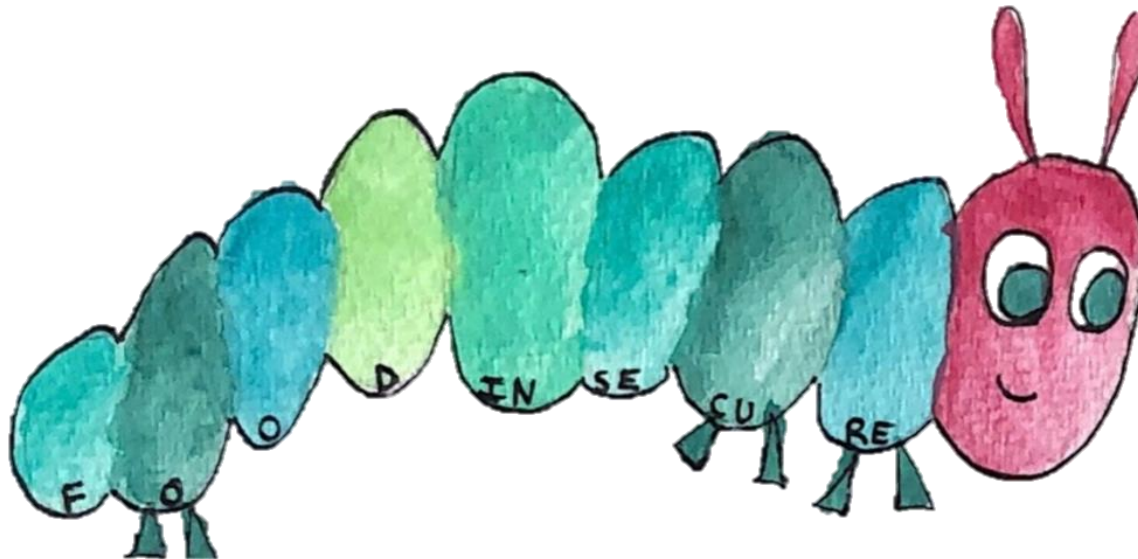


**CATAMOUNT**

FELLOWSHIP FOR EMERGING CHANGEMAKERS

# The Very Hungry Calgary Caterpillar

*A story of food insecurity in Calgary communities*



Created by Julia Gerritsen, Bachelor of Nursing

Illustrations by Julia Gerritsen and Norah Gerritsen

Adapted from the original Children's Book "The Very Hungry Caterpillar," written by Eric Carle

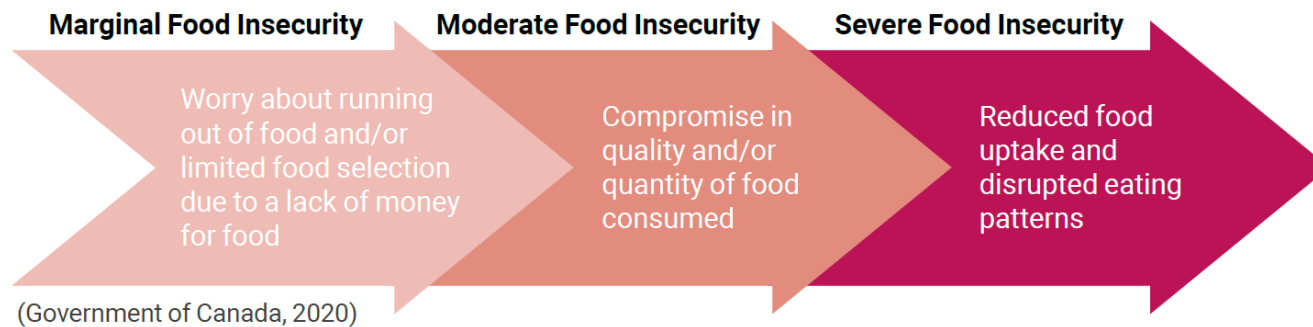


Institute for  
Community Prosperity



# Foreword

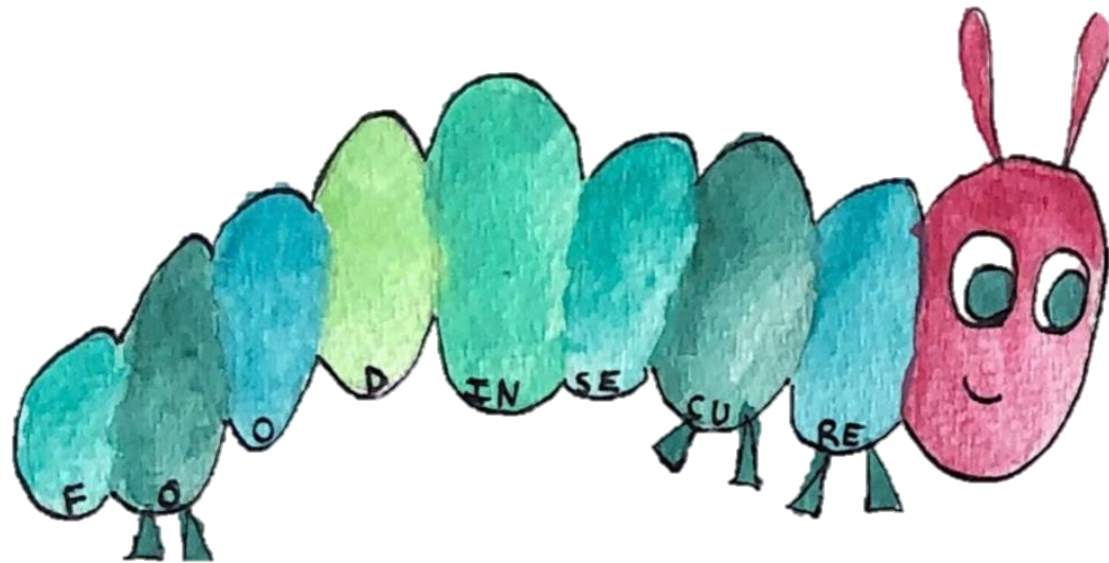
Many Calgarians experience food insecurity and there is a need for our current system to change. The intention of the following story is to highlight select barriers to food insecurity that exist in Calgary, as well as opportunities for change within the solutions landscape. This story does not represent an individual's experience with food insecurity, nor does it wish to simplify the complex nature of each household's unique circumstances. All Calgarians should be aware and listen to the personal stories of food insecurity on their own streets.



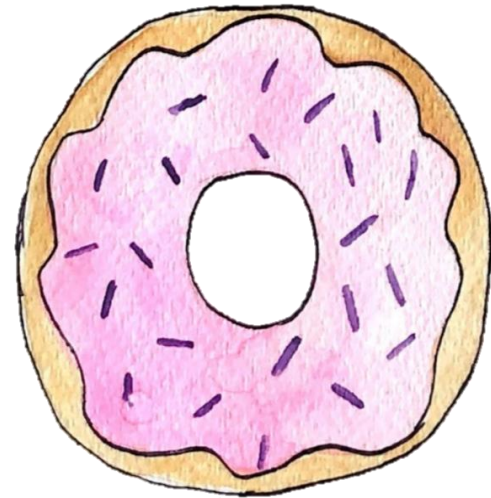
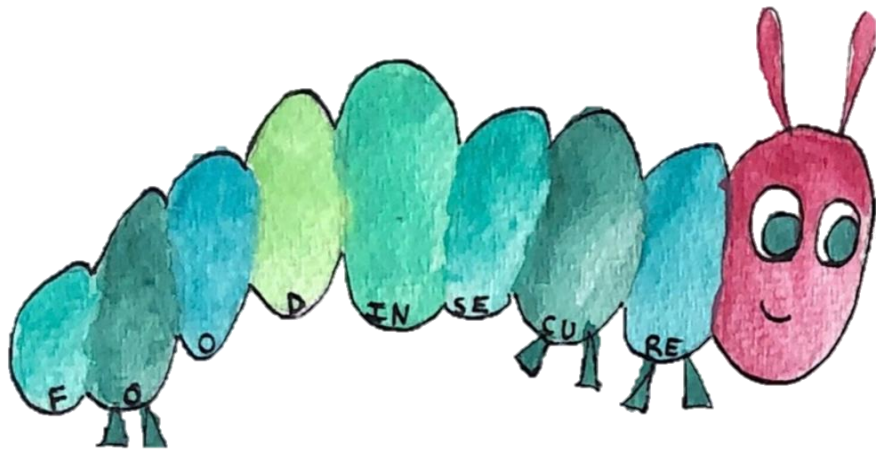
To view the discovery snapshot and full report on Food Insecurity in Calgary Communities, please visit <https://www.mtroyal.ca/nonprofit/InstituteForCommunityProsperity/StudentPrograms/CatamountFellowship.htm>



One morning the sun  
came up in Calgary and  
out came a tiny and  
very hungry caterpillar.



He began to look for food in his community, but could only see a fast food restaurant.



The caterpillar ate one donut, but he was still hungry.

The next day the caterpillar looked for the nearest grocery store.

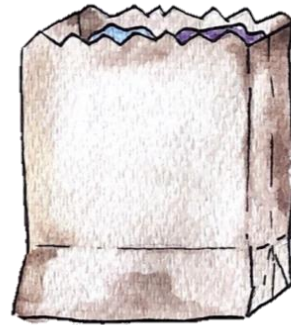
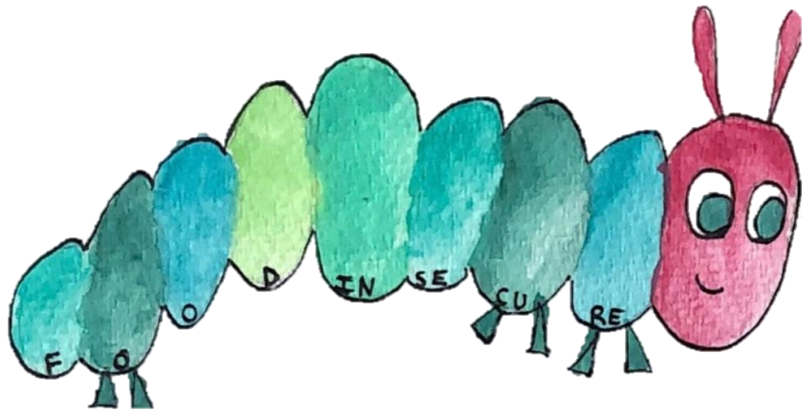


It was too far to walk, so he took the bus.

In the grocery store, the caterpillar did not have enough money to buy fruits and vegetables, but he was still hungry.

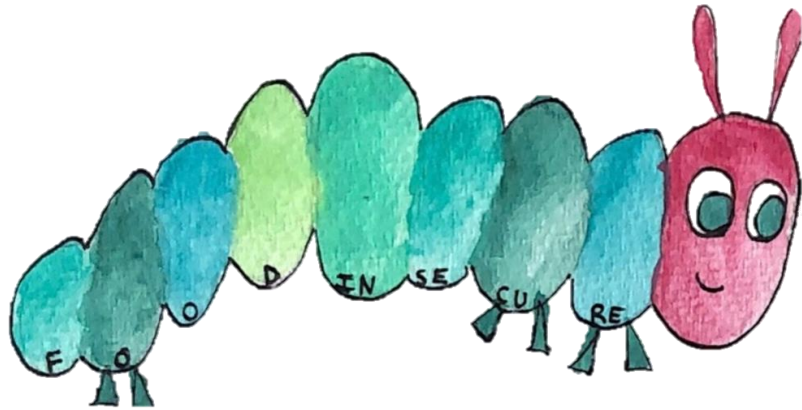


He bought some low cost foods instead.



He did not have much room to fit his grocery bags on the bus.

The next day, the caterpillar was still hungry.

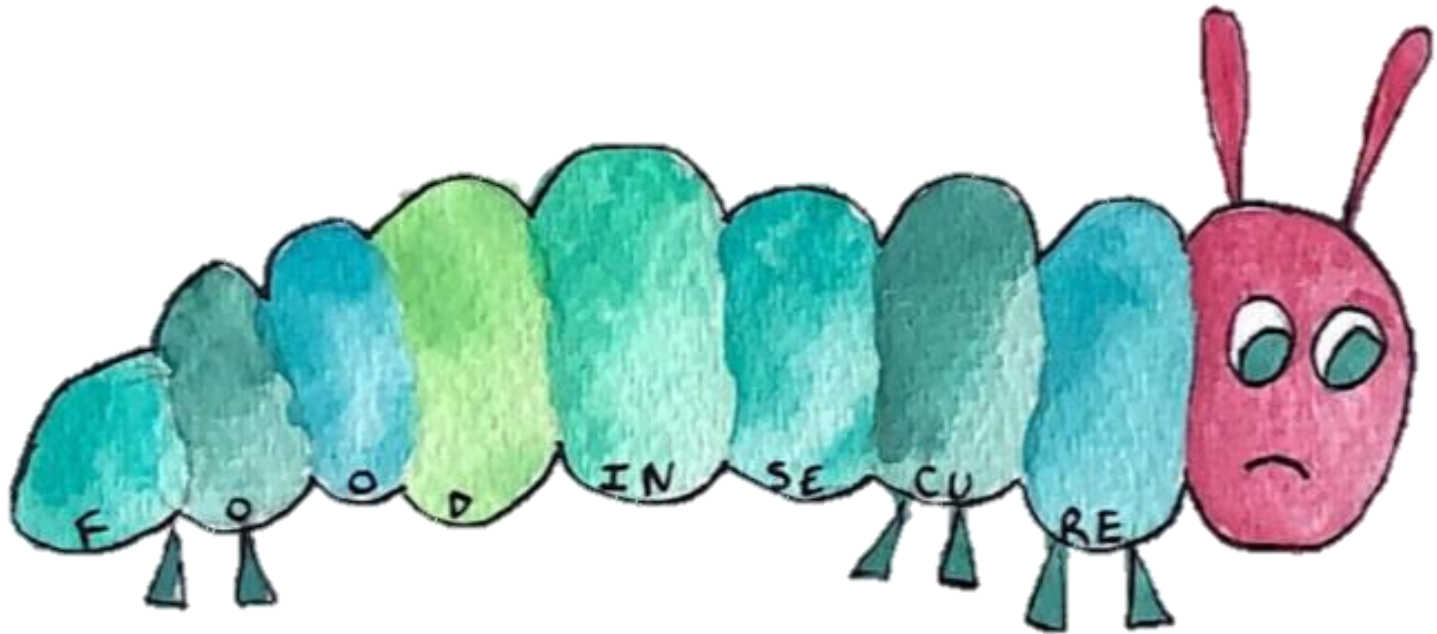


He visited the food bank where they gave him some groceries.



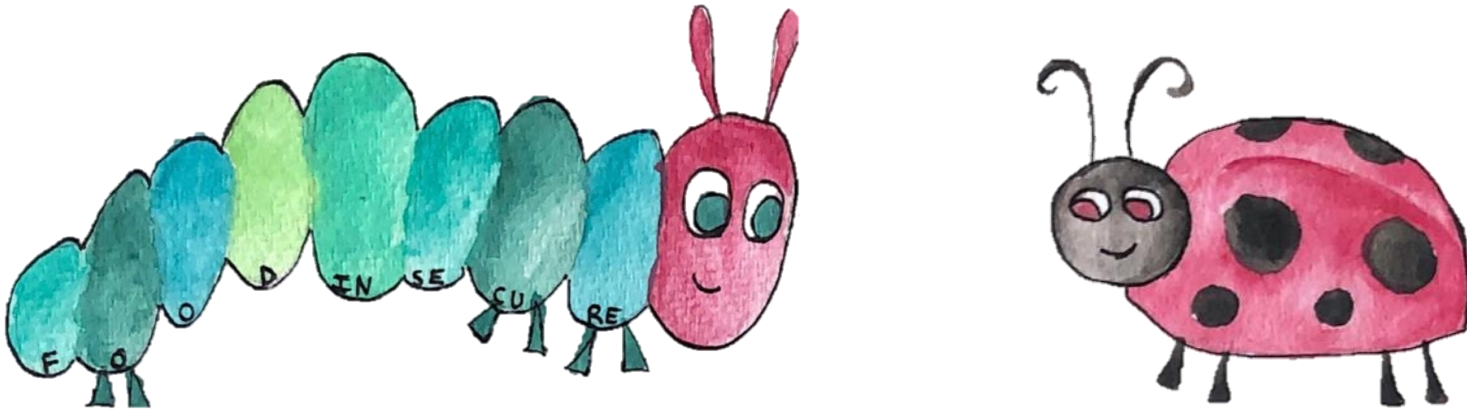
But when the caterpillar got home, he decided to skip dinner so that he would have enough food for the week.

By the end of the month, the caterpillar had no food left, but he was still hungry and very tired.



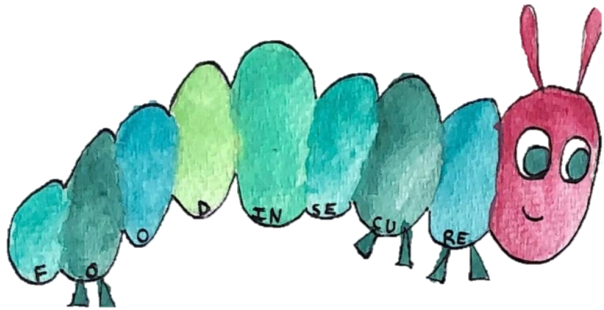


One day the caterpillar saw his friend the ladybug.

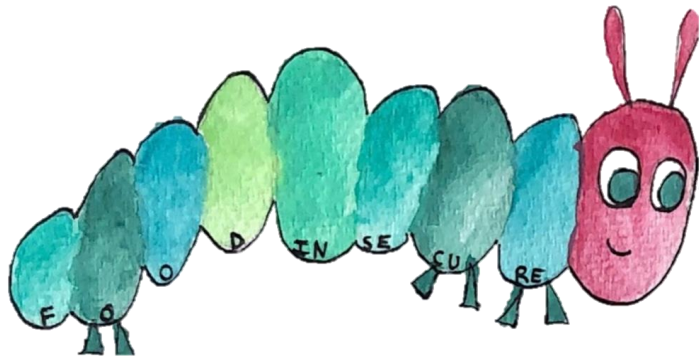


The ladybug told him about a mobile grocery store that visits their community every Tuesday with affordable fruits and vegetables!

The ladybug and caterpillar also decided to start a community garden to grow their own food and invited different bugs from their community to help.

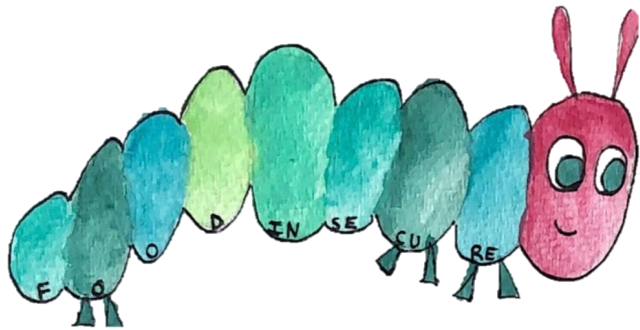


The caterpillar felt ashamed to tell the other bugs that he often was hungry...



But then he talked to the bumble bee.

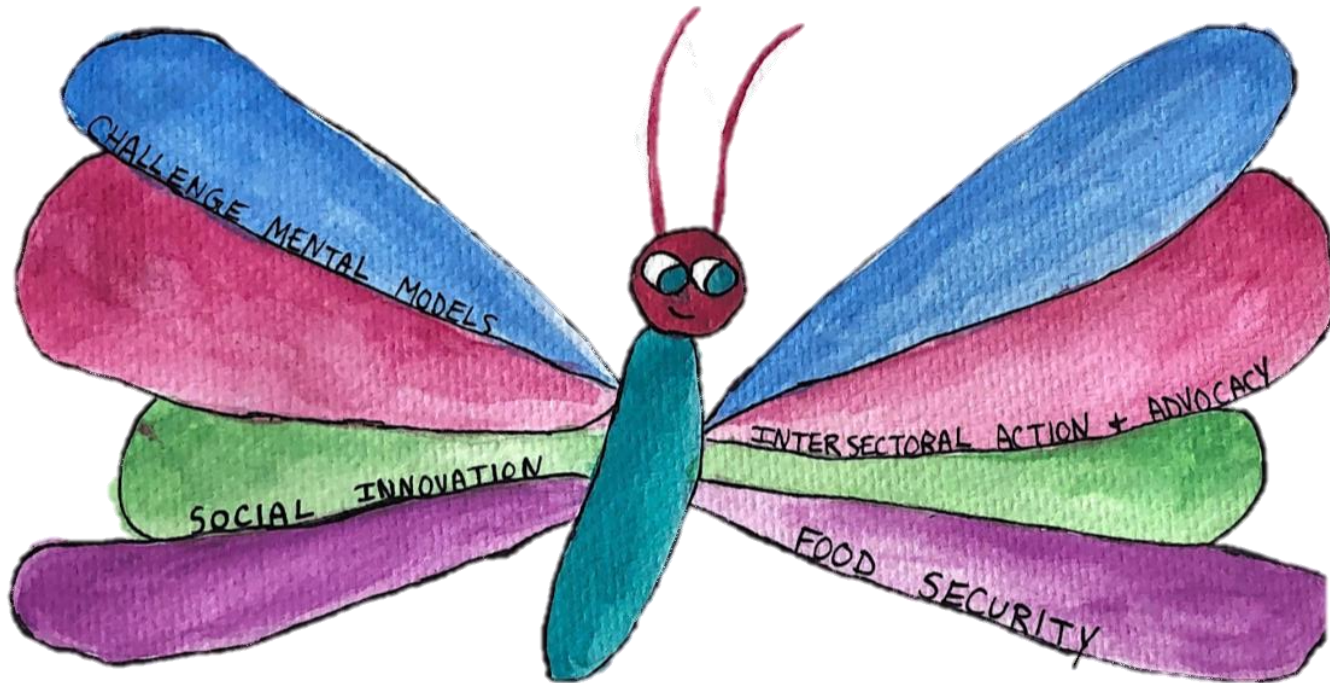
The bumble bee told the caterpillar  
sometimes he is hungry too!



The bumble bee told him about a “food  
prescription” that was available to help  
the caterpillar afford healthy foods.

The next week, the  
caterpillar realized  
something was different...

He was not hungry  
anymore.



And he was a beautiful butterfly!

# Julia Gerritsen - Scholarly Output



# CATAMOUNT

FELLOWSHIP FOR EMERGING CHANGEMAKERS

# Food Insecurity in Calgary Communities

Julia Gerritsen  
MRU Catamount Fellowship  
April 2021





# Acknowledgements

## Mount Royal University

- Dr. Heather Nelson
- Madelaine Vanderwerff
- Brian Jackson

## Institute for Community Prosperity at Mount Royal University

- Barb Davies
- James Stauch
- Cordelia Snowdon
- 2020/2021 Catamount Fellows

## Leftovers Foundation

- Jocelyn Herbert

## Other Contributors

- Elle Griffin – Wilde Information Design
- Thank you to all community conversation participants for their valuable input

Mount Royal University is located in the traditional territories of the Niitsitapi (Blackfoot) and the people of the Treaty 7 region in Southern Alberta, which includes the Siksika, the Piikani, the Kainai, the Tsuut'ina, and the Iyârhe Nakoda. The City of Calgary is also home to Métis Nation 3 of Alberta.



# Table of Contents

- 01** Research Purpose and Methodology ..... **04**
- 02** Foreword ..... **05**
- 03** Introduction ..... **06**
- 04** Calgary’s Landscape ..... **08**
- 05** The Health Consequences of Food Insecurity ..... **09**
- 06** Solutions Landscape ..... **11**
- 07** Intersectoral Action and Advocacy ..... **12**
- 08** Supporting Social Innovation ..... **14**
- 09** Innovation Efforts in Calgary ..... **15**
- 10** Additional Efforts in Calgary ..... **16**
- 11** References ..... **18**
- 12** Appendix A ..... **21**
- 13** Appendix B ..... **22**
- 14** Appendix C ..... **23**



# 01 Research Purpose and Methodology

This report aims to explore the issue of food insecurity in Canada through a systems lens. The research focuses on food insecurity and hunger in the context of Calgary communities and highlights health intersections. Secondary research in the form of academic and non-academic sources provides qualitative and quantitative data and is used alongside community-engaged learning to recognize barriers and uncover potential areas for sustainable action. This report is further guided by insights from a community conversation hosted during the Catamount fellowship, which included participation by individuals and stakeholders within the food security system in Calgary. Tools used to develop and frame the research include systems mapping and the adaptive cycle.

The question that the research aims to explore is “how might we improve access to healthy and affordable food options to address food insecurity in Calgary communities?”



**“One cannot think well,  
love well, sleep well, if  
one has not dined well.”**

*Virginia Woolf*

## 02 Foreword

For the duration of my fourth year of Nursing at Mount Royal University I had the opportunity to participate in the Catamount Fellowship, which is a transformational learning experience for emerging changemakers offered by the Institute for Community Prosperity. I developed valuable skills through opportunities to collaborate across sectors and learned how I can be a leader and create change. I gained the ability to take a step back and look at the moving parts and relationships within a system. I also learned to embrace complexity and challenge the underlying mental models that influence our actions. As I dove into the exploration of food insecurity, I discovered that hunger exists within a dynamic system. I questioned why Calgarians living in our own communities experience high rates of food insecurity and shifted my mindset to look “upstream” at root causes. I collaborated with stakeholders as well as my community partner, Leftovers Foundation, using community-engaged

research to explore the systemic issue that affects a staggering number of Canadians living on our own streets. The Leftovers Foundation is one of Western Canada’s largest food rescue charities with a dual mission of reducing food waste and increasing food access through community mobilization. Their goal is to ensure edible food is kept out of the landfill and instead is redirected into the hands of those who need it most. Leftovers supported and inspired my learning throughout the fellowship.

I believe that health is essential to experiencing life every day at the greatest capacity. Food is a resource for health maintenance that every individual has the right to access. This report is a collection of my discoveries regarding food insecurity and includes suggestions for creating sustainable and effective change moving forward.

# 03 Introduction

Access to food is not only a basic need, but a universal human right. A balanced diet is integral to the maintenance of a healthy lifestyle; however, as a society we have been unsuccessful at ensuring Canadians consistently have enough to eat. Without access to healthy and affordable food, individuals are denied the opportunity to prevent disease through their diet and consequently experience negative impacts on socio-economic status, educational outcomes and mental health. The importance of access to healthy and affordable food is recognized by the World Health Organization's (WHO, 2020) Sustainable Development Goal to globally "end hunger, achieve food security and improved nutrition" (17 SDGs section). In 2020, Canada ranked 12th on the global food security index, behind countries including Japan, Switzerland, the United States, and the United Kingdom (Global Food Security Index, n.d.). Comparing the rates of food insecurity within Canada to other developed countries illustrates the potential for improvement. Food insecurity is a systemic issue that requires collective action to support new solutions.

## The Problem: Food Insecurity in Canada

Statistics from the Household Food Security Survey Module (HFSSM) in 2017-2018 show that 12.7% of Canadian households experience food insecurity and that 4.4 million Canadians are going hungry (Tarasuk & Mitchell, 2020, p.8). The data indicates 12.9% of households in Alberta are food-insecure (Tarasuk & Mitchell, 2020, p.8-9) and 11.6% of Calgarians experience food insecurity (Tarasuk & Mitchell, 2020, p.27), suggesting a substantial need for local action. Food insecurity is most prevalent in populations that experience a low socioeconomic status, especially those living on low and insecure incomes (Tarasuk & Mitchell, 2020, p.10). Households that rely on wages as their main source of income make up 75.2% of the food insecure population in Alberta (Tarasuk & Mitchell, 2020, p.12) indicating that the current minimum wage might not be enough to ensure adequate access to food. Additionally, the government support that is available to individuals living on low income still may not be substantial enough to cover the costs of groceries. In Canada, over half of food insecure households also rely on social assistance (Tarasuk & Mitchell, 2020, p.12) and "social assistance/benefits too low" was the main reason for accessing food banks in 2019 (Food Banks Canada, 2019).

Significant financial stressors such as job loss, legal fees, death of a breadwinner and chronic illness may push food secure households into insecurity (Alberta Health Services [AHS], 2017). Food insecurity affects many households through impacts such as the inability to provide a balanced

meal for children, running out of food and having no money to buy more, only being able to buy low-cost items, skipping meals, or not eating for an extended period of time (Government of Canada, 2020). The issue landscape of food insecurity is complex and constantly changing because each household's experience is unique.

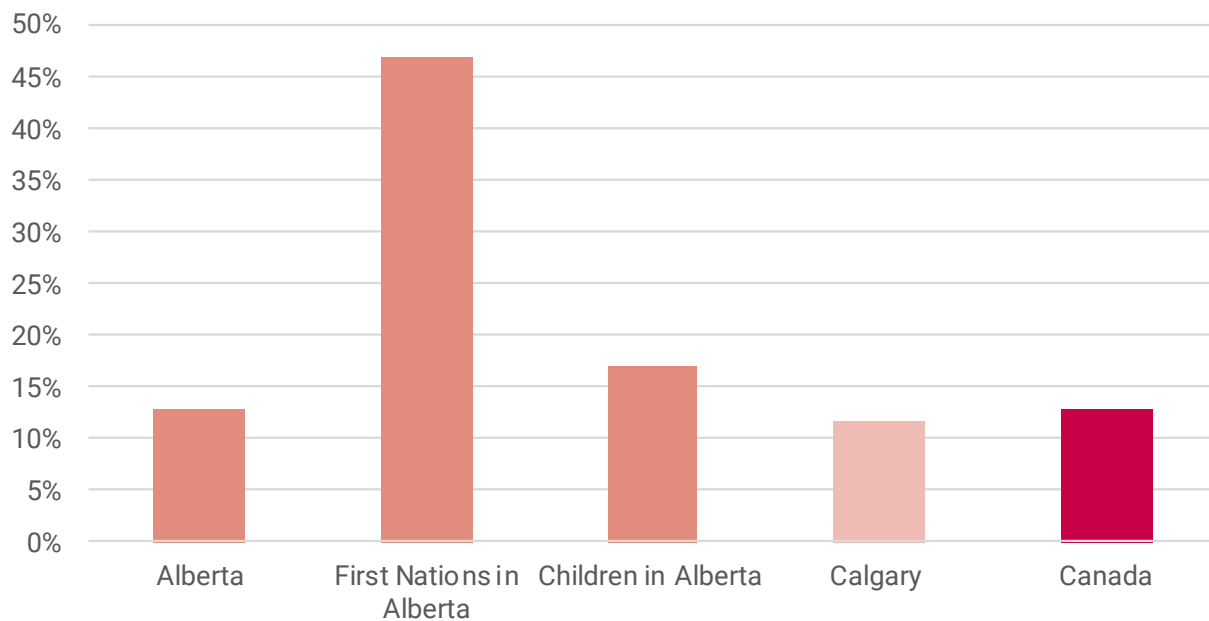
The predominant response to food insecurity in Canada is food charity, which grew in popularity during the economic recession of the 1980's when many individuals and families were going hungry (Tarasuk & McIntyre, 2020). Temporary charitable food assistance programs were developed as a response to food needs, but as the number of people requiring access grew, services like food banks quickly became permanent (Tarasuk & McIntyre, 2020). The term food insecurity is described as "inadequate or insecure access to food because of financial constraints" (Tarasuk & Mitchell, 2020, p.3) and is measured in Canada through the Household Food Security Service Model (HFSSM) as part of the Canadian Community Health Survey (Government of Canada, 2020). The HFSSM uses a survey of 10 questions for adults and 8 questions regarding children in a household to categorize whether they are food secure or marginally, moderately, or severely food insecure (Government of Canada, 2020) as shown in Appendix A.

## Who is Affected by Food Insecurity?

Certain populations experience a greater risk of food insecurity in Canada, some of whom include recent immigrants (less than 5 years), Indigenous people, those who racially identify as Black (Tarasuk & Mitchell, 2020, p.13), people with a disability, single people, people who lack employment due to racial discrimination and homeless populations (AHS, 2017). Canadian children encounter hunger at extremely high rates as one in six live in food-insecure households (Tarasuk & Mitchell, 2020, p.4). Compared to the general population, children are overrepresented as they make up 34.1% of people accessing food banks (Food Banks Canada, 2019). When children are food insecure, they experience negative impacts on academic achievement (Faught et al., 2017) as well as poor nutritional and socioemotional effects (Ashiabi & O'Neal, 2008, p.74). Additionally, the rates of food insecurity for single-parent families are significantly higher than for couples, especially if the parent is female (Tarasuk & Mitchell, 2020, p.10).

A population group that experiences one of the highest rates of food insecurity in Canada are Indigenous peoples (Tarasuk & Mitchell, 2020, p.13). The First Nations Food, Nutrition and Environment study (FNFNES) (2013) found

## Percentage of Food Insecure Households in Select Populations



(Tarasuk & Mitchell, 2020; FNFES, 2013)

that 47% of First Nations households in Alberta were food insecure, 34% moderately food insecure, and 13% experienced food shortages (p. 2). Adults were found to eat inadequate amounts of grains, fruit/vegetables, and milk products which places them at risk for deficiencies and poor health outcomes (FNFES, 2013, p.2). Income is inversely associated with reported food insecurity in First Nations households, especially in remote areas (Deaton et al., 2019, p.5). Additionally, First Nations individuals who are severely food insecure are more likely to have been diagnosed with a mood disorder, in comparison to food secure households (Deaton et al., 2019, p.11). Indigenous people experience disproportionate rates of food insecurity and require increased resources, as they face environmental, geographical, social, political and financial barriers to accessing healthy and affordable food.

### COVID-19 Pandemic Impact

The COVID-19 pandemic has caused unprecedented challenges that affect communities in numerous ways. Families that are experiencing interruptions in employment caused by COVID-19 are almost three times more likely to experience food insecurity as they struggle to afford meals (Children First Canada, 2020, p.28). "Income shock" paired with unique health stressors that arise due to the pandemic have the potential to significantly increase the number of Canadians experiencing moderate to severe food insecurity (Deaton, 2020, p. 148). The Breakfast Club of Canada projects that because of COVID-19, over one third of children will be attending school without having breakfast (Children First Canada, 2020).

However, many creative interventions have been established for households that need access to affordable food due to adverse consequences of the pandemic. Affordable grocery baskets available for delivery, grocery gift cards, and community support through online platforms are all examples of local efforts. Our lives are constantly changing due to the uncertainties of COVID-19, so it is important to both consider and anticipate that food insecurity will increase and require more intervention than ever before.

# 04 Calgary's Landscape

There are additional barriers preventing access to healthy and affordable food that are specific to Calgary. In 2015, only 63% of Calgarians lived within 2000 meters of a grocery store, which is significantly lower than previously examined Canadian cities such as Saskatoon and Montreal (Lu & Qui, 2015, p. 274). Additionally, the researchers state higher access to food was found in inner city areas and clusters of Northeast, North and West areas, while eight communities in Calgary had to travel more than 3000 meters to reach the nearest supermarket (p.280). Through analysis that considers average income levels as an indicator for food access in those communities, Bridgeland/Riverside and Applewood park were identified as actual food deserts (p. 279) (Appendix B). The large distances between households and grocery stores in Calgary is a barrier to accessing healthy and affordable food, especially for individuals who do not have access to car and/or rely on transit.

The competitive food retail market and quickly expanding suburban development in Calgary results in neighborhoods that lack accessible services such as supermarkets (Lu & Qui, 2015, p. 279). As the number of newly developed communities increases, updated data is needed to re-assess the prevalence of limited geographical access to supermarkets. This information would provide a more accurate understanding of the food deserts in Calgary in 2021.

Poor geographical access to healthy food can be related to the displacement of independent local grocery stores by big-box chain retailers that consequently causes a lack of access for many low-income communities (Bedore, 2013, p. 149-150). It is important to recognize differences between food exposure and food access; a landscape may be mistaken as accessible if it contains a healthy retailer (for example, a grocery store such as Safeway or Co-op) without considering if there is exposure to a large number of unhealthy options (such as McDonalds, A&W, etc.) in the same area (Clary et al., 2017, p. 4). Additionally, a community may have an accessible retailer of healthy food, but it may not be affordable or convenient (Clary et al., 2017, p.4). Local research regarding "food swamps" and "food mirages" would be beneficial to understanding the different variations of geographical food access in Calgary.

The lack of transportation that many Calgarians experience is a significant challenge to accessing healthy and affordable food retailers. The urban design of communities in Calgary does not support walking or biking to supermarkets, and issues with the transit system include the lack of routes, frequency, and storage for groceries (The Calgary Food Committee, 2012, p.139). Additionally, access to grocery stores either on transit or by walking can be difficult in the winter months in Calgary, as the climate is cold and creates additional hazards such as snow and ice.

## FOOD DESERT

exists when "geographic areas have limited access to healthy food," forcing people to rely on convenience stores and fast food (Chen & Gregg, 2017, p. 1)

## FOOD SWAMP

an area that has healthy retailers overpowered by a large number of unhealthy food options (Chen & Gregg, 2017, p. 1)

## FOOD MIRAGE

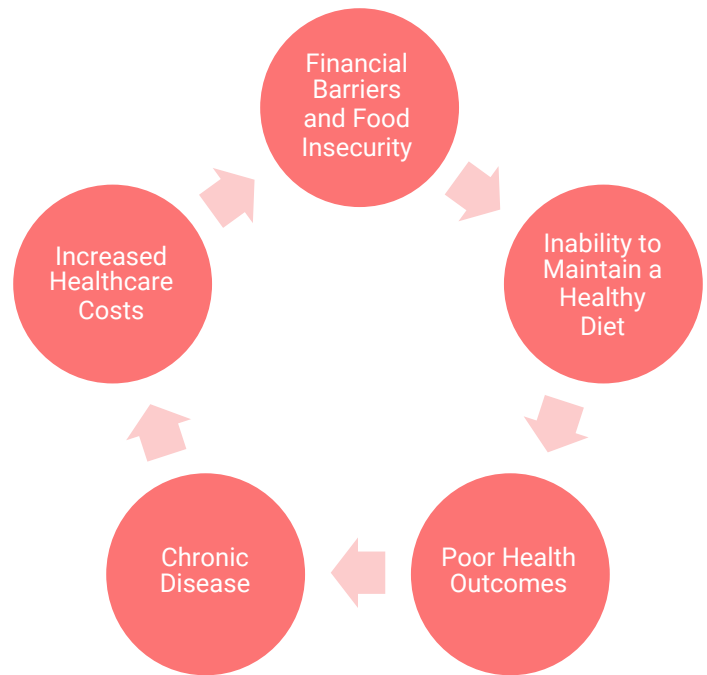
occurs when people with a low income are unable to afford the healthy options that are in their community (Chen & Gregg, 2017, p. 1)

# 05 The Health Consequences of Food Insecurity

## Physical Health

Individuals who experience food insecurity are more vulnerable to negative impacts on physical health. Food insecurity and nutritional inadequacies increase health risks for Canadians, such as mothers delivering babies with low birth weights, children and toddlers having poor health and hospitalization, and adolescents lacking sufficient amounts of essential nutrients (AHS, 2017). Additionally, prolonged food insecurity can place adults at risk for chronic illness as food insecurity has been significantly associated with heightened risk for conditions such as hypertension, diabetes (Seligman et al., 2010; AHS, 2017), and cardiovascular disease (Vercammen et al., 2019, p. 696). Individuals who experience food insecurity are more likely to pass away at a significantly earlier age than food secure individuals (Men et al., 2020, p. 57-58). Food insecurity also results in significantly higher healthcare costs associated with emergency room visits, hospital and physician visits, home care, surgeries and prescription drugs (Tarasuk et al., 2015, p.429).


Chronic disease and food insecurity exist in a cyclical relationship, as many individuals with a chronic illness are vulnerable to becoming food insecure due to medication and treatment costs, reduced earnings and lack of energy to manage finances (AHS, 2017). Many people with chronic illness are unable to afford the specific diets and treatments encouraged by healthcare professionals, causing their health to deteriorate (AHS, 2017). An example illustrating this feedback loop includes people who have been diagnosed with diabetes that are food insecure. These individuals face challenges with managing their disease, including trouble spacing meals and maintaining appropriate carbohydrate intake throughout the day (Chan et al., 2015, p.6). Foods that are high in fats and carbohydrates cost less than healthy options such as fruits in vegetables, which further contributes to obstacles with following a diabetic diet when food insecure (Seligman et al., 2011, p.235). Food insecurity can discourage these individuals from healthy behaviors such as physical activity and monitoring blood glucose (Chan et al., 2015, p.7). Ultimately, food insecure individuals with diabetes experience increased emotional stress and difficulty following recommended diets, resulting in poor glycemic control (Seligman et al., 2011, p.235).



Food insecurity has a substantial impact on the overall health of an individual that involves more than the development of a disease process. Chilton et al. (2017) state that intergenerational hardships influence economic stress in adulthood, and food insecurity is linked to adversity and violence throughout the lifespan. Family patterns of adversity can lead to intergenerational food insecurity and toxic stress in children, which is “a strong and prolonged activation of a child’s stress management systems that is particularly problematic during critical developmental periods because of the effects it has on brain architecture” (Chilton et al., 2017, p. 290). Additionally, Ishaq et al. (2019) found that low-income populations often have poor nutrition and a lack of healthy dietary options, leading to inadequate gut microbial diversity. Diminished gut microbiota has been found to impact mental processes such as learning capacity and alertness, obesity associated with financial and social burdens, and psychiatric disorders (Ishaq et al., 2019). Improving health outcomes through food security involves equitable access to a diverse diet, not just a full stomach.



## Mental Health



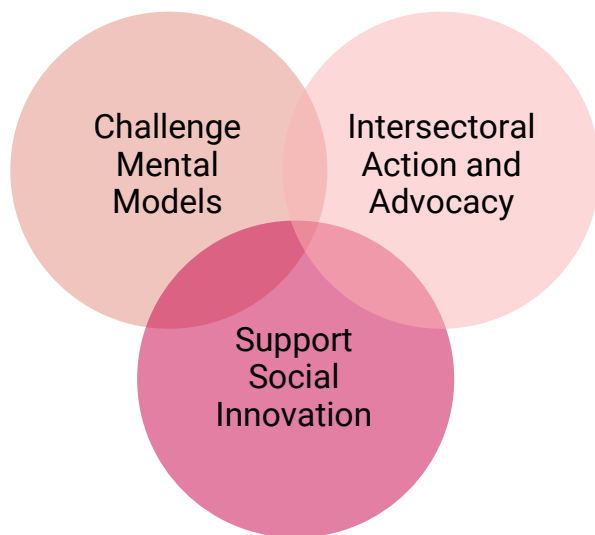
**“When you’ve experienced hunger on an ongoing basis it stays with you and constitutes a lasting traumatic experience. There can be shame and self-blame in admitting that you are hungry. It impacts your dignity and self-worth when you are unable to feed yourself or your family. And there is this fear which never really goes away of lacking food at some point again. My mother experienced chronic hunger throughout her childhood and to this day- over 60 years later! - that fear of not having enough food is still with her.”**

*Carole Carpot-Lacassagne, 2018  
Women’s Center of Calgary Blog Post*

Food insecurity can also have significant impacts on mental health. Martin et al., (2015) found that in Canada, “mental illness was more prevalent among those experiencing food insecurity” (p.89). Adverse mental health outcomes such as depressive thoughts and episodes, anxiety disorders, mood disorders and suicidal thoughts are all related to the chronic stressor of food insecurity (Jessiman-Perreault & McIntyre, 2017, p. 468). Children living in food insecure households often have low self-efficacy for healthy choices, as well as low self-esteem (Godrich et al., 2019, p.7). Food insecurity is related to negative mental health impacts, and individuals who access food charity may also be affected by feelings of shame and loss of dignity.

# 06 Solutions Landscape

Food insecurity is a complex system that both exists within the larger food system and contains many smaller systems itself. Structures, barriers, solutions, resources and key players all have a unique influence on the food insecurity system, however, it is impossible to capture the system as a whole within the confines of a report. Instead, a systems map (Appendix C) with the specific boundaries of Calgary and health impacts allows for a clear picture of select elements, impacts and relationships that influence food insecurity. The knowledge and insights acquired through a community conversation hosted during the Catamount fellowship regarding hunger in Calgary is the primary inspiration for this solutions landscape. Addressing food insecurity in Calgary communities through sustainable change is possible through challenging current mental models, encouraging intersectoral action and advocacy, and creating space to support new innovations.



## Challenging Mental Models

Improving food security for Canadians involves shifting underlying beliefs about the solution to hunger and changing assumptions about people who are hungry. Although food banks provide over 5 million meals and snacks to hungry Canadians (Food Banks Canada, 2019), food charity does little to address the root causes of food insecurity. Food bank statistics significantly “understate the prevalence of food insecurity” (para. 3) and fail to capture changes over time (PROOF, 2016). Only a small amount of the food insecure population turns to food charity out of desperation, and these families remain food insecure despite accessing services (PROOF, 2016). Nick Saul, president and CEO of Community Food Centers Canada, stated in a TED talk that “we have been told, and far too many of us believe, that handing out food to poor and struggling people will fill their need and end their hunger” (Saul, 2016). He continues to describe the “ecosystem of food charity” that we have created as a result of mistakenly focusing on using food to solve the food insecurity crisis (Saul, 2016). Food charity also propagates unequal power relationships, as the “donator” often benefits from the feeling of doing good without considering what a food insecure person actually requires for support, while the person receiving donations loses a sense of dignity and self-reliance.

The systemic issue of food insecurity is not significantly improving in Alberta, as shown by comparing data from 2015-2016 and 2017-2018 (Tarasuk & Mitchell, 2020, p. 15). There will always be a need for emergency food assistance, however, food charity will not solve the root causes of hunger. The reliance on food banks as the only solution is problematic, and funders should be encouraged to participate in innovations that move away from the typical mental model of food charity.

Another underlying assumption about food insecurity is shame and stigma. Many individuals are afraid to admit they are food insecure and unable to provide for themselves or their family. Building a sense of community can connect people to supports and open space for conversations to normalize talking about hunger and sustainable solutions. Changing mental models is a massive endeavor, but it is essential for growth as a society. Every individual has the power to make change by challenging their own assumptions and encouraging others to look at food insecurity from a root cause perspective instead of focusing on the symptom of hunger.

# 07 Intersectoral Action and Advocacy

Food insecurity is an issue that is linked to health experiences and outcomes. Individuals working in the healthcare field have the opportunity to advocate and collaborate across sectors to improve food access. Health professionals can promote Health Equity for individuals who experience food insecurity by increasing supports and minimizing barriers (AHS, 2017, p.11).

The following table is a summary of Alberta Health Service's recommended actions for health professionals to reduce food insecurity and promote health equity in Alberta.

## Health Equity

"A measure of fairness around the opportunity to achieve one's full health potential without facing unnecessary or discriminatory barriers related to race, ethnicity, religion, sex, age, social class, socioeconomic status, sexual orientation or physical ability."

(Whitehead & Dahlgren, 2006, as cited in AHS, 2017)

Category of Action	Highlighted Example
Assess and Report	Promote the use of <b>validated measures</b> of food insecurity rather than data that describes some of the experiences of food insecure populations. <i>ex) informing stakeholders that food bank statistics are not reliable markers of food insecurity.</i>
Modify and Orient Interventions	Integrate an assessment of <b>socioeconomic risk factors</b> into client service pathways. <i>ex) assessing how an individual's eating patterns are affected by their finances and looking for ways to reduce healthcare costs (providing free parking, transit passes and childcare).</i>
Partner with Other Sectors	Develop relationships with <b>media partners</b> to establish and promote accurate messages about Household Food Insecurity. <i>ex) providing media with messages that help the public understand that alleviating hunger is not the same as addressing food insecurity.</i>
Participate in Policy Development	Create and sustain policies that <b>reduce the costs of basic living</b> expenses to help free up more money to spend on healthy food. In Alberta, Social Housing and Affordable Housing Programs can help prevent or reduce food insecurity among low-income households. Establish healthy eating environments that offer affordable and healthy food options to promote social inclusion.

(Adapted from "The Affordability of Healthy Eating in Alberta", by AHS, 2017, p. 14-19)



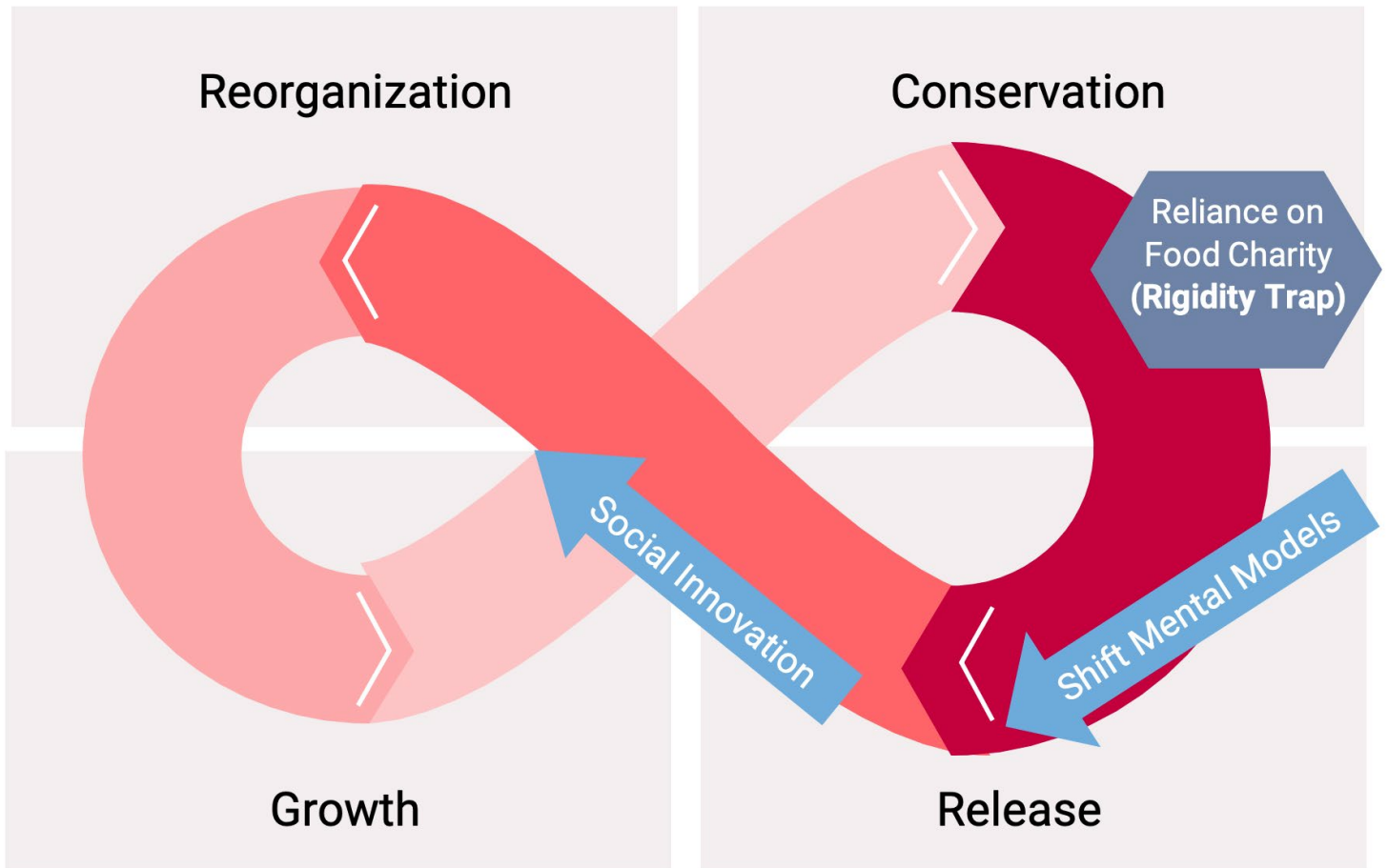
Government policy that supports the reduction of food insecurity has the potential to make a sizeable impact on ensuring affordable and equitable food access for all Canadians. Food insecurity exists within the greater system of poverty, which could be addressed by the implementation of enhanced income supports, potentially in the form of universal basic income or a similar intervention. Government funding that enables everyone to “meet their basic needs, participate in society and live with dignity, regardless of work status” (Pasma & Regehr, 2019, p. 5) would ensure that Canadians have financial access to healthy foods to maintain a balanced diet.

The impact that public policy has on food insecurity is evident through smaller funding initiatives. For example, Brown and Tarasuk (2019) found that increases in the Canada Child Benefit (CCB) significantly benefited food insecure households. Even a small income supplement could improve food security for Canadian families with young children (Ionescu-Iltu et al., 2014). Additionally, the risk of food insecurity in low-income older adults is significantly reduced through benefits such as the Canadian Old Age Security (OAS) and Guaranteed Income Supplement (GIS) (McIntyre et al., 2016, p. 283).

Another area that policy changes may have an impact involves affordable housing. High housing costs are reported to be one of the main reasons people need to access food banks (Food Banks Canada, 2019). Housing instability, such as utilities being threatened or shut off, is associated with lower diet quality in adults (Bottino et al., 2019). The households that experience the most food insecurity are renters, and housing policy is essential to address the vulnerabilities of low-income individuals and families (St-Germain & Tarasuk, 2020).

Government action plays a role in re-shaping food security in Canada but food banks and community food center models still provide essential services and support to the population (Edge & Meyer, 2019). Due to the large range of circumstances for the food insecure population, there is no single solution and many approaches can consecutively work to end hunger in Canada (Edge & Meyer, 2019). Looking forward, efforts must be put into place through policy, advocacy and education to minimize food insecurity in Canada.

# 08 Supporting Social Innovation



Shifting efforts towards improving food insecurity involves creating and supporting new solutions through social innovation. The adaptive cycle is a tool that focuses on the transitions and dynamics of a system (Resilience Alliance, n.d.) and can be used to frame our current experience of food insecurity in Canada. Food charity has been the primary response to hunger for over 30 years, which corresponds with the “conservation” stage of the cycle. The structures and beliefs about hunger result in a rigidity trap, preventing

the occurrence of important transitions. To improve the food security system, we must let go of what is not working and restructure. There are multiple efforts in Calgary that are exploring new ideas and solutions to move our system into the reorganization stage to create sustainable change. However, these projects require a shift in mental models that are perpetuating food charity. Greater impact is possible through increased support of innovations within the solutions landscape.

# 09 Innovation Efforts in Calgary

## Fresh Routes – Mobile Grocery Store

“Fresh Routes is a not-for-profit social enterprise that is focused on creating new, innovative ways of providing healthy and affordable food to as many Canadians as possible – especially those who need it most. [Their] Mobile Grocery Stores brings healthy, fresh, and affordable food into neighbourhoods facing barriers – allowing choice, maintaining dignity, and building community. [Their] mission is to ensure that everyone has access to affordable, nutritious food and is informed to make healthy decisions and live a healthy life”

*(Fresh Routes, n.d.)*

**fresh routes**

## Community Kitchen Program of Calgary

The Community Kitchen in Calgary supports many food insecure families as they “teach participants how to prepare nutritious meals, budget their finances -- making their income stretch by preparing cost effective, healthy meals, as well as providing a means to access nutritious food” (Community Kitchen, n.d.). They offer multiple programs including an affordable “Good Food Box” that has depot locations spread across the city, “Calgary’s Cooking” which brings individuals together to plan and cook healthy and budget-friendly meals, and “Souper Stars” which provides education for elementary students about food, self-esteem, and a healthy lifestyle.



## Community Gardens in Calgary

Community gardens offer a space for connection and collectively grown fresh food. The city of Calgary supports the development of community gardens through policy and some funding which contributes to the establishment of over 200 public and private gardens (Lowan-Trudeau et al., 2021, p.506). Although gardens are evenly distributed in communities throughout the city, Lowan-Trudeau et al. (2021) found that these neighborhoods had fewer visible minorities (p. 512). Community gardens provide the opportunity for culturally appropriate foods, interactions and communication across different cultures and support a sense of belonging (p.513). Therefore, consideration should be taken to create equitable access when developing new gardens in Calgary to support under-represented groups (p. 513).



(Click the plant icon to find a community garden close to you)

# 10 Additional Opportunities

## Pay What you Can Model

Pay what you can is a not-for-profit business model that promotes financial accessibility and community responsibility through only charging what the buyer can afford. Although this innovation is currently not available in Calgary, the pay what you can model has the potential to improve equitable access to food in our city. In Toronto, a pay what you can grocery store, café and bakery established by Feed It Forward inspires the possibility of utilizing a similar model in Calgary communities.

(Click the logo to watch a video of the model in action)



## Food Prescription Programs

A food prescription involves a primary care provider referring patients to the fresh food program, similar to how they would prescribe medications. This model has made an impact in Detroit, where a clinician meets with low-income participants and their families to “discuss healthy eating and assess fruit and vegetable consumption, access to healthy food, and knowledge and skills for choosing, preparing and eating fresh fruits and vegetables” (Ecology Center, 2017). The clinician then helps set goals for healthy eating and the participants can “fill” their prescription at local partnering farmers markets or stands. In 2015, 90% of participants reported they manage their health conditions better since participating in the program.

(Click the logo to watch a video)



## Social Enterprise – AKI Foods

AKI foods is an Indigenous not-for-profit social enterprise that promotes economic development and employment in First Nations communities, focusing on healthy food projects (AKI, n.d.). They recognize the disproportionate experience of food insecurity in Northern First Nations communities and work to increase access to healthy and affordable food, with an emphasis on building local food systems. They currently have a healthy food box program as well as the “Meechim Project,” which “aims to grow healthy, locally grown food for the community and provides education and training opportunities for Indigenous youth” (AKI, n.d.).



## Educational Resources

Creating and sharing educational resources is a strategy to help shift the current underlying mental models that prevent food security. The following are a collection of relevant materials that can be shared to increase knowledge about the causes and response food insecurity (click to learn more):



- Kids Respond to Child Hunger
- PROOF Fact Sheets
- Webinars Offered by Food Security Canada
- The Affordability of Healthy Eating in Alberta



- Why food won't solve the problem of hunger | Nick Saul | TEDxToronto
- The full story of Food (In)security | Valerie Tarasuk



# 11 References

- AKI. (n.d.). About AKI foods. Retrieved March 23, 2021, from <http://www.akienergy.com/about-aki-foods>
- Alberta Health Services. (2017). Household food insecurity in Alberta: A backgrounder. <https://www.albertahealthservices.ca/assets/info/nutrition/if-nfs-household-food-insecurity-in-alberta.pdf>
- Alberta Health Services. (2017). The affordability of healthy eating in Alberta 2015. Available from <http://www.albertahealthservices.ca/assets/info/nutrition/if-nfs-affordability-of-healthy-eating.pdf>
- Ashiabi, G., & O'Neal, K. (2008). A framework for understanding the association between food insecurity and children's developmental outcomes. *Child Development Perspectives*, 2(2), 71–77. <https://doi.org/10.1111/j.1750-8606.2008.00049.x>
- Bedore, M. (2013). Geographies of capital formation and rescaling: A historical-geographical approach to the food desert problem. *The Canadian Geographer*, 57(2), 133–153. <https://doi.org/10.1111/j.1541-0064.2012.00454.x>
- Bottino, C., Fleegler, E., Cox, J., & Rhodes, E. (2019). The relationship between housing instability and poor diet quality among urban families. *Academic Pediatrics*, 19(8), 891–898. <https://doi.org/10.1016/j.acap.2019.04.004>
- Brown, E., & Tarasuk, V. (2019). Money speaks: Reductions in severe food insecurity follow the Canada Child Benefit. *Preventive Medicine*, 129, 105876–105876. <https://doi.org/10.1016/j.ypmed.2019.105876>
- Carpot-Lacassagne, C. (2018, May 28). Women, hunger, and food insecurity. Women's Center of Calgary. <https://www.womenscentrecalgary.org/combating-food-insecurity/>
- Chan, J., DeMelo, M., Gingras, J., & Gucciardi, E. (2015). Challenges of diabetes self-management in adults affected by food insecurity in a large urban centre of Ontario, Canada. *International Journal of Endocrinology*, 903468–903469. <https://doi.org/10.1155/2015/903468>
- Chen, T., Gregg, E. (2017). Food deserts and food swamps: A primer. National Collaborating Center for Environmental Health. [https://www.nceh.ca/sites/default/files/Food\\_Deserts\\_Food\\_Swamps\\_Primer\\_Oct\\_2017.pdf](https://www.nceh.ca/sites/default/files/Food_Deserts_Food_Swamps_Primer_Oct_2017.pdf)
- Chilton, M., Knowles, M., & Bloom, S. (2017). The intergenerational circumstances of household food insecurity and adversity. *Journal of Hunger & Environmental Nutrition*, 12(2), 269–297. <http://dx.doi.org/10.1080/19320248.2016.1146195>
- Children First Canada. (2020). Raising Canada 2020; Top 10 threats to childhood in Canada and the impact of covid-19. Retrieved from [https://static1.squarespace.com/static/5669d2da9cadb69fb2f8d32e/t/5f51503d5ceab254db134729/1599164484483/Raising+Canada+Report\\_Final\\_Sept.pdf](https://static1.squarespace.com/static/5669d2da9cadb69fb2f8d32e/t/5f51503d5ceab254db134729/1599164484483/Raising+Canada+Report_Final_Sept.pdf)
- Clary, C., Matthews, S., & Kestens, Y. (2017). Between exposure, access and use: Reconsidering foodscape influences on dietary behaviours. *Health & Place*, 44, 1–7. <https://doi.org/10.1016/j.healthplace.2016.12.005>
- Community Kitchen. (n.d.). Home. Retrieved March 4, 2021, from <https://www.ckpcalgary.ca/>
- Deaton, B., Scholz, A., & Lipka, B. (2019). An empirical assessment of food security on First Nations in Canada. *Canadian Journal of Agricultural Economics*, 68(1), 5–19. <https://doi.org/10.1111/cjag.12208>
- Deaton, D. (2020). Food security and Canada's agricultural system challenged by COVID-19. *Canadian Journal of Agricultural Economics*, 68(2), 143–149. <https://doi.org/10.1111/cjag.12227>
- Ecology Center. (February 2017). Fresh prescription; Recipe for a healthy Detroit. <https://www.ecocenter.org/fresh-prescription>
- Edge, S., & Meyer, S. (2019). Pursuing dignified food security through novel collaborative governance initiatives: Perceived benefits, tensions and lessons learned. *Social Science & Medicine* (1982), 232, 77–85. <https://doi.org/10.1016/j.socscimed.2019.04.038>
- Fafard St-Germain, A., & Tarasuk, V. (2020). Homeownership status and risk of food insecurity: examining the role of housing debt, housing expenditure and housing asset using a cross-sectional population-based survey of Canadian households. *International Journal for Equity in Health*, 19(1), 5–5. <https://doi.org/10.1186/s12939-019-1114-z>
- Faught, E., Williams, P., Willows, N., Asbridge, M., & Veugelers, P. (2017). The association between food insecurity and academic achievement in Canadian school-aged children. *Public Health Nutrition*, 20(15), 2778–2785. <https://doi.org/10.1017/S1368980017001562>
- First Nations Food, Nutrition and Environment Study. (2013). Summary of Results: Alberta. <http://www.fnfnes.ca/docs/>

- Food Banks Canada. (2019). Hunger count 2019 report. <https://hungercount.foodbankscanada.ca/>
- Fresh Routes. (n.d.). About. Retrieved March 4, 2021, from <https://freshroutes.ca/about/>
- Global Food Insecurity Index. (n.d.). Rankings and trends: Performance of countries based on their 2020 food security score. Retrieved April 12, 2021, from <https://foodsecurityindex.eiu.com/index>
- Goddard, E. (2020). The impact of COVID-19 on food retail and food service in Canada: Preliminary assessment. *Canadian Journal of Agricultural Economics*, 68(2), 157–161. <https://doi.org/10.1111/cjag.1224>
- Godrich, S., Loewen, O., Blanchet, R., Willows, N., & Veugelers, P. (2019). Canadian children from food insecure households experience low self-esteem and self-efficacy for healthy lifestyle choices. *Nutrients*, 11(3), 675. <https://doi.org/10.3390/nu11030675>
- Government of Canada. (2020, February 18). Determining food security status. <https://www.canada.ca/en/health-canada/services/food-nutrition/food-nutrition-surveillance/health-nutrition-surveys/canadian-community-health-survey-cchs/household-food-insecurity-canada-overview/determining-food-security-status-food-nutrition-surveillance-health-canada.html#adult>
- Ionescu-Ittu, R., Glymour, M., & Kaufman, J. (2014). A difference-in-differences approach to estimate the effect of income-supplementation on food insecurity. *Preventive Medicine*, 70, 108–116. <https://doi.org/10.1016/j.ypmed.2014.11.017>
- Ishaq, S., Rapp, M., Byerly, R., McClellan, L., O'Boyle, M., Nykanen, A., Fuller, P., Aas, C., Stone, J., Killpatrick, S., Uptegrove, M., Vischer, A., Wolf, H., Smallman, F., Eymann, H., Narode, S., Stapleton, E., Cioffi, C., & Tavalire, H. (2019). Framing the discussion of microorganisms as a facet of social equity in human health. *PLoS Biology*, 17(11), e3000536–e3000536. <https://doi.org/10.1371/journal.pbio.3000536>
- Jessiman-Perreault, G., & McIntyre, L. (2017). The household food insecurity gradient and potential reductions in adverse population mental health outcomes in Canadian adults. *SSM - Population Health*, 3(C), 464–472. <https://doi.org/10.1016/j.ssmph.2017.05.013>
- Lowan-Trudeau, M., Keough, N., Wong, J., & Haidey, S. (2020). The affordable housing, transportation, and food nexus: Community gardens and healthy affordable living in Calgary. *The Canadian Geographer*, 64(3), 502–515. <https://doi.org/10.1111/cag.12606>
- Lu, W., & Qiu, F. (2015). Do food deserts exist in Calgary, Canada?: Do food deserts exist in Calgary? *The Canadian Geographer*, 59(3), 267–282. <https://doi.org/10.1111/cag.12176>
- Martin, M., Maddocks, E., Chen, Y., Gilman, S., & Colman, I. (2016). Food insecurity and mental illness: disproportionate impacts in the context of perceived stress and social isolation. *Public Health (London)*, 132, 86–91. <https://doi.org/10.1016/j.puhe.2015.11.014>
- McIntyre, L., Dutton, D., Kwok, C., & Emery, J. (2016). Reduction of food insecurity among low-income Canadian seniors as a likely impact of a guaranteed annual income. *Canadian Public Policy*, 42(3), 274–286. <https://doi.org/10.3138/cpp.2015-069>
- Men, F., Gundersen, C., Urquia, M., & Tarasuk, V. (2020). Association between household food insecurity and mortality in Canada: A population-based retrospective cohort study. *Canadian Medical Association Journal (CMAJ)*, 192(3), E53–E60. <https://doi.org/10.1503/cmaj.190385>
- Mendly-Zambo, Z., & Raphael, D. (2019). Competing discourses of household food insecurity in Canada. *Social Policy and Society: a Journal of the Social Policy Association*, 18(4), 535–554. <https://doi.org/10.1017/S1474746418000428>
- Pasma, C., & Regehr, S. (2019). Basic income: Some policy options for Canada. Basic Income Canada Network. [https://d3n8a8pro7vhmx.cloudfront.net/bicn/pages/3725/attachments/original/1579707497/Basic\\_Income\\_-\\_Some\\_Policy\\_Options\\_for\\_Canada2.pdf?1579707497](https://d3n8a8pro7vhmx.cloudfront.net/bicn/pages/3725/attachments/original/1579707497/Basic_Income_-_Some_Policy_Options_for_Canada2.pdf?1579707497)
- PROOF Food Insecurity Policy Research. (2016, March 3). Food bank stats don't tell the story of food insecurity. <https://proof.utoronto.ca/food-bank-stats-dont-tell-the-story-of-food-insecurity/>
- Resilience Alliance. (n.d.). Adaptive cycle. Retrieved March 5, 2021, from <https://www.resalliance.org/adaptive-cycle#:~:text=An%20adaptive%20cycle%20that%20alternates,cells%20to%20ecosystems%20to%20societies>
- Saul, N. (2016, December 13). Why food won't solve the problem of hunger. [Video]. TEDx Toronto. <https://www.youtube.com/watch?v=xwyrMK81-FQ>
- Seligman, H., Jacobs, E., Lopez, A., Tschann, J., & Fernandez, A. (2011). Food insecurity and glycemic control among low-income patients with type 2 diabetes. *Diabetes Care*, 35(2), 233–238. <https://doi.org/10.2337/dc11-1627>
- Seligman, H., Laraia, B., & Kushel, M. (2010). Food Insecurity Is Associated with Chronic Disease among Low-Income NHANES Participants. *The Journal of Nutrition*, 140(2), 304–310. <https://doi.org/10.3945/jn.109.112573>

- Tarasuk, V., Cheng, J., de Oliveira, C., Dachner, N., Gundersen, C., & Kurdyak, P. (2015). Association between household food insecurity and annual health care costs. *Canadian Medical Association Journal (CMAJ)*, 187(14), E429–E436. <https://doi.org/10.1503/cmaj.150234>
- Tarasuk, V., Li, T., Mitchell, A., & Dachner, N. (2018). Commentary - The case for more comprehensive data on household food insecurity. *Health Promotion and Chronic Disease Prevention in Canada*, 38(5), 210–213. <https://doi.org/10.24095/hpcdp.38.5.03>
- Tarasuk, V., & McIntyre, L. (2020, June 12). Food insecurity in Canada. *The Canadian Encyclopedia*. Retrieved from <https://www.thecanadianencyclopedia.ca/en/article/food-insecurity-in-canada>
- Tarasuk V, & Mitchell A. (2020) Household food insecurity in Canada, 2017-18. Toronto: Research to identify policy options to reduce food insecurity (PROOF). <https://proof.utoronto.ca/> <https://www.canada.ca/en/health-canada/services/food-nutrition/food-nutrition-surveillance/health-nutrition-surveys/canadian-community-health-survey-cchs/household-food-insecurity-canada-overview/determining-food-security-status-food-nutrition-surveillance-health-canada.html>
- Tester, J., Lang, T., & Laraia, B. (2015). Disordered eating behaviours and food insecurity: A qualitative study about children with obesity in low-income households. *Obesity Research & Clinical Practice*, 10(5), 544–552. <https://doi.org/10.1016/j.orcp.2015.11.007>
- The Calgary Food Committee. (2012). Calgary food system assessment & action plan. The City of Calgary. <https://www.calgary.ca/content/dam/www/pda/pd/documents/calgary-eats/calgaryeats-full-food-system-assessment-action-plan-for-calgary.pdf>
- Vercammen, K., Moran, A., McClain, A., Thorndike, A., Fulay, A., & Rimm, E. (2019). Food Security and 10-Year Cardiovascular Disease Risk Among U.S. Adults. *American Journal of Preventive Medicine*, 56(5), 689–697. <https://doi.org/10.1016/j.amepre.2018.11.016>
- World Health Organization (n.d.). Sustainable development goals (SDGs). Retrieved October 29, 2020, from [https://www.who.int/health-topics/sustainable-development-goals#tab=tab\\_1](https://www.who.int/health-topics/sustainable-development-goals#tab=tab_1)

# 12 Appendix A

## Household Food Insecurity Categories

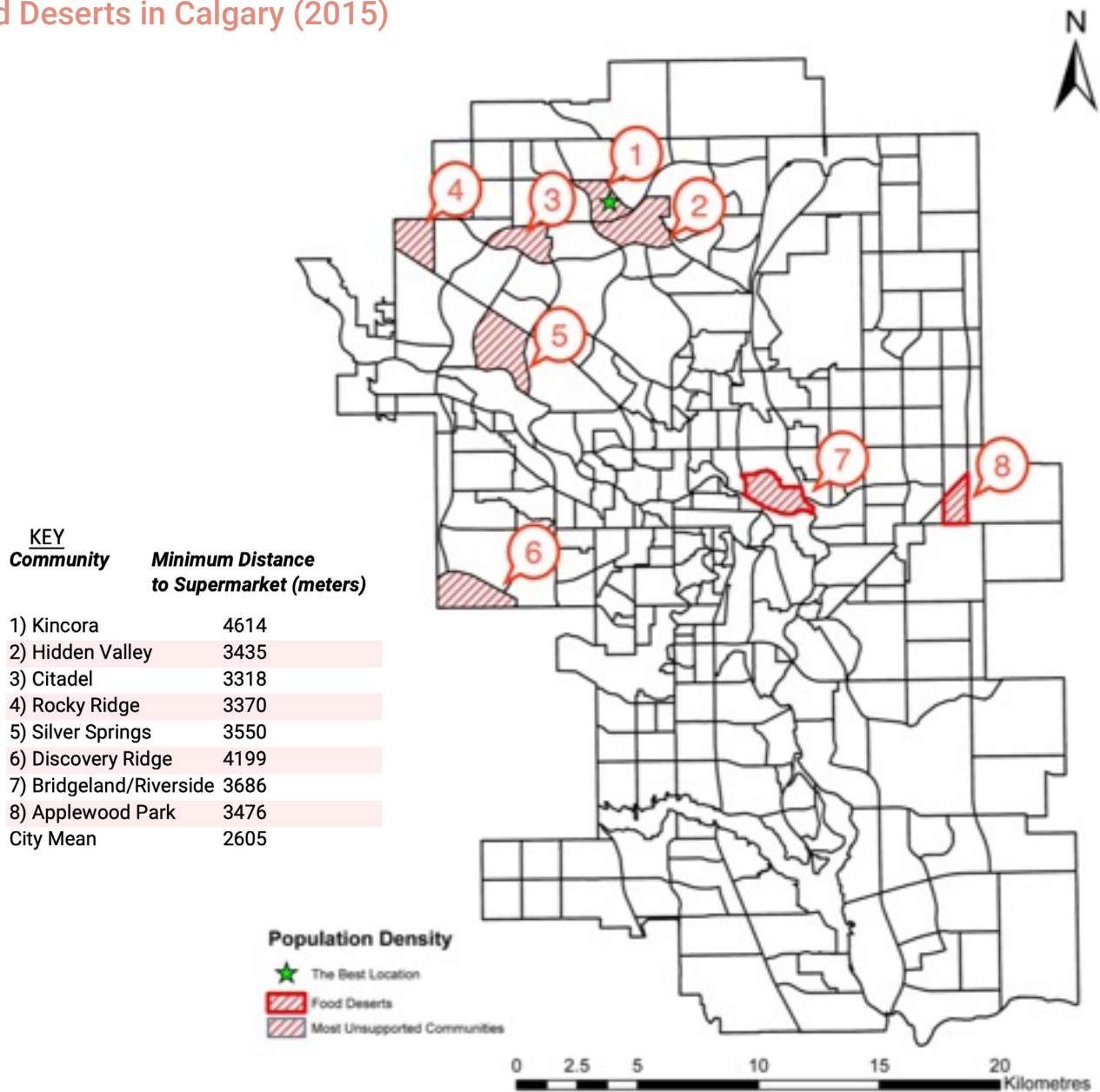
<b>Food security status, based on 18 item questionnaire*</b>			
<b>Status</b>	<b>Interpretation</b>	<b>10 item adult food security scale</b>	<b>8 item child food security scale</b>
<b>Food secure</b>	No report of income-related problems of food access.	No items affirmed	No items affirmed
<b>Marginal food insecurity**</b>	Some indication of worry or an income-related barrier to adequate, secure food access.	Affirmed no more than 1 item on either scale	
<b>Moderate food insecurity</b>	Compromise in quality and/or quantity of food consumed by adults and/or children due to a lack of money for food.	2 to 5 positive responses	2 to 4 positive responses
<b>Severe food insecurity</b>	Disrupted eating patterns and reduced food intake among adults and/or children	6 or more positive responses	

\* Adapted from: Canadian Community Health Survey, cycle 2.2, Nutrition (2004): Income related Household Food Security in Canada.

\*\* One item in either scale affirmed. (Tarasuk & Mitchell, 2020, p.22).

# 13 Appendix B

## Food Deserts in Calgary (2015)



**Figure 5**  
Communities with high need and low access to supermarkets (Lu & Qui, 2015, p. 278-279)

# 14 Appendix C

## Systems Map Food Insecurity in Calgary

