Food Mirages in Guelph, Ontario: The Impacts of Limited Food Accessibility and Affordability on Low-income Residents

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ABSTRACT

Food Mirages in Guelph, Ontario: The Impacts of Limited Food Accessibility and Affordability on Low-income Residents

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The aims of this study are (1) to locate areas of limited access to affordable food in Guelph, Ontario and (2) to explore the impacts of experiencing barriers to accessing healthy affordable food. Firstly, a Food Affordability Index was compiled and displayed in a series of maps, showing that most of the areas with a higher prevalence of <LICO residents are outside of a 1km walking distance to a low-cost grocery store. Downtown Guelph, showing a high prevalence of <LICO residents, is home to the two most expensive grocery stores in the city, with no lower cost option available. Secondly, a sample (n=15) of food insecure <LICO Guelph residents completed interviews and surveys to explore the impacts of limited affordable food accessibility on their lives. They described symbolic barriers of race and class at the high-cost grocery stores in downtown Guelph, exacerbating the lack of affordable food there.
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# TABLE OF CONTENTS

ABSTRACT.......................................................................................................................... II
ACKNOWLEDGEMENTS ....................................................................................................... III
TABLE OF CONTENTS........................................................................................................... V
LIST OF TABLES AND MAPS ............................................................................................... VII
1 INTRODUCTION .................................................................................................................. 1
2 LITERATURE REVIEW ....................................................................................................... 3
  2.1 Food Mirages .................................................................................................................. 3
  2.2 Food insecurity and food oppression ............................................................................. 5
  2.3 Food deserts .................................................................................................................. 7
  2.4 Other factors that influence food shopping location .................................................... 10
  2.5 Diet quality and socioeconomic status ........................................................................ 12
  2.6 Cultural capital and healthy food choices .................................................................... 15
  2.7 Conclusion .................................................................................................................... 17
3 METHODS .......................................................................................................................... 20
  3.1 Food affordability index ............................................................................................... 20
  3.2 Food environment mapping ......................................................................................... 24
  3.3 Interviews and surveys ............................................................................................... 27
    3.3.1 Research ethics ........................................................................................................ 27
    3.3.2 Sample .................................................................................................................... 27
    3.3.3 Recruitment ............................................................................................................. 29
    3.3.4 Location ................................................................................................................... 30
    3.3.5 Confidentiality and consent .................................................................................... 31
  3.4 Surveys .......................................................................................................................... 32
4 DATA ANALYSIS .............................................................................................................. 32
  4.1 Food affordability index ............................................................................................... 32
  4.2 Food environment mapping ......................................................................................... 33
  4.3 Interviews ..................................................................................................................... 35
  4.4 Surveys .......................................................................................................................... 38
5 RESULTS ............................................................................................................................ 38
  5.1 Food affordability index ............................................................................................... 38
  5.2 Food environment mapping ......................................................................................... 43
  5.3 Interviews and surveys: descriptive statistics ............................................................... 50
  5.4 Interviews: qualitative analysis ................................................................................... 58
    5.4.1 Local food affordability: cost .................................................................................. 58
    5.4.2 Perceived barriers to eating a healthier diet: transportation ................................ 62
LIST OF TABLES AND MAPS

Table 1. Food affordability index scores and total cost of nutritious food basket (NFB) ................................................................. 39
Table 2. Three-tiered store affordability rankings ........................................ 40
Table 3. Fresh fruit and vegetable affordability scores and total cost of fresh fruits and vegetables (NFB) .................................................. 41
Table 4. Meat affordability index scores and total cost of meat (NFB) .......... 42
Map 1. Grocery store affordability in Guelph ................................................ 45
Map 2. Low-cost grocery stores in Guelph ................................................... 46
Map 3. The interaction of grocery store cost and LICO prevalence by dissemination area in Guelph, Ontario ........................................... 48
Table 5. Descriptive statistics for demographic information of the interview and survey sample ............................................................... 52
Table 6. Descriptive statistics regarding food accessibility, affordability, and insecurity ........................................................................ 54
Table 7. Relative purchasing power of the average monthly food budget for different grocery stores .............................................................. 57
Map 4. The interaction of grocery store cost and LICO prevalence by dissemination area in Chatham, Ontario ............................................ 139
1. Introduction

The downtown area of the city of Guelph, Ontario has a variety of grocery stores although – as can be quickly learned by local food shoppers – the food prices there are the highest in the city, sitting at roughly double the cost of food at low-cost grocery stores. The nearest low-cost grocery store is almost two kilometers walking distance from downtown Guelph, thus, considering that affordable food is over one kilometer away, downtown Guelph can be defined as a “food mirage,” due to this limited access to affordable food. The goal of this study is to explore, quantify, and qualify the experiences of low-income residents faced with this type of food environment and the limited access to affordable fresh foods that it entails for them.

As a long time fresh food enthusiast, organic farm volunteer, urban forager, specialty food entrepreneur, and social activist, my initial concerns were focused on the physical health of those negatively impacted by food insecurity. More specifically, I was interested to see how living in a food mirage or food desert would effect fresh food consumption as well as overall food consumption, as fresh fruit and vegetable consumption has been shown to buffer against many chronic diseases (Hung et al., 2004; 2006; Daucet et al., 2006; Pomerleau et al., 2006; Carter et al., 2010; Boffetta et al., 2010; Ledoux et al., 2011). I have been curious to research how proximity to one's preferred place of food shopping effects one's shopping frequency and fresh food consumption. Also, more generally speaking, I am very curious to see if there are any other possible impacts that food shopping distance or food shopping frequency may produce. Although the present study touches on
these topics, in order to thoroughly answer these specific questions, a much larger study would be necessary with many more participants.

The present study has two primary aims. The first aim is to identify food deserts and food mirages in Guelph, Ontario. Up to the present date, the identification of food mirages has yet to be done by any researchers within the Canadian context, and has been done only once in a US study by Breyer & Voss-Andreae (2013). To do so, a Food Affordability Index – ranking grocery stores by food price affordability – was first calculated and then visually displayed through a series of maps of the food environment in Guelph. The maps show in detail where precisely food deserts and food mirages are located, while incorporating neighborhood income information (measured by the prevalence of persons living below the Low-Income Cut Off), in order to pinpoint areas of the city where food accessibility is most limited and thus, where food insecurity is most acute.

The second aim of the study is to qualitatively explore various aspects of low-income residents’ experiences with food affordability, food accessibility, and food insecurity. To do so, a mixed methods approach was taken, including a short survey as well as semi-structured interviews ($n=15$). The survey questions (along with some interview questions) focused on gathering quantitative data regarding food affordability, food accessibility, and food insecurity. The interview questions were used to generate qualitative data regarding various facets of the individual’s experiences with food affordability, food accessibility, and food insecurity. Some of
the key themes that were pursued in the research interviews include but are not limited to: perceived barriers to food accessibility, food shopping patterns and transportation, differences in food quality between stores, strategies for obtaining adequate healthy foods, fresh food consumption, the social ecology of local grocery stores, usage and criticisms of emergency food services and other social programs, skipping meals and rationing, and food-related physical and psychological stress.

Although there has been much more quantitative than qualitative research on food insecurity conducted in Canada, some qualitative research has been conducted in Canada (Hamelin et al., 1999), while outside of the Canadian context many qualitative studies on food insecurity have been conducted (Fenton et al., 2012; Feilding-Miller et al., 2014; Ghattas et al., 2017; to name a few). What separates my study from prior studies is my specific focus on the interaction between food affordability, shopping location, and food accessibility in light of the reality of the food mirage.

2. Literature Review

2.1. Food Mirages

Areas lacking direct physical access to full-service grocery stores are widely known as “food deserts” (Cummins & Macintyre, 2002; Zenk et al., 2005; Apparicio et al., 2007). The term “food mirage” was coined by Short et al. (2007) to describe situations where, although there are full-service grocery stores in an area, high prices make fresh foods economically inaccessible to low-income households. It has
been argued that the negative health impacts of food mirages are similar to those of food deserts because “managing the challenges of time, distance and cost means infrequent shopping trips and less fresh produce” (Everett, 2011, p. 14).

To date there have been very few empirical studies on food mirages. Those few studies have been carried out in only two locations: Portland, Oregon, and Winnipeg, Manitoba. Breyer and Voss-Andreae (2013) calculated an index based on the USDA Thrifty Food Plan to measure the affordability of grocery stores in Portland, Oregon. They then used mapping to show that food mirages were plentiful in Portland, concluding that both proximity and price are important measures in assessing healthful food accessibility. The second Portland study, by Sullivan (2014), focused on gentrifying neighborhoods transitioning from food deserts to food mirages, and showed that the appearance of new high-cost grocery stores in areas where there previously were no stores at all did little to change food accessibility for low-income earners. The one Canadian study on this topic, Wiebe et al. (2016), based in Winnipeg, focused on broadening the understanding of socio-economic barriers to food access by examining socio-economic data of neighborhoods, but did not measure grocery store affordability, and thus could only locate food deserts and possible food mirages.

Due to the limited research on food mirages available, I will draw heavily on the research literature on food deserts and food security, as these two topics are closely
related to food mirages in that they both address concerns with environmental barriers to food accessibility for the low-income population.

2.2. **Food Insecurity and Food Oppression**

Food insecurity is “the inability to acquire or consume an adequate diet quality or sufficient quantity of food in socially acceptable ways, or the uncertainty that one will be able to do so” (Davis & Tarasuk, 1994, p. 50). In both Canada and the US, food insecurity has been shown to disproportionately affect indigenous communities and people of color (CCHS, 2015; Coleman-Jensen et al., 2016). The 2014 Canadian Community Health Survey conducted by *Statistics Canada* has shown that 12% of Canadian households are food insecure, accounting for 1 in 8 Canadian citizens. The same CCHS data shows that 46.8% of households are food insecure in Nunavut, the territory (or province) with the largest proportion of indigenous residents. In the United States, the situation is no better. The USDA estimated in a report based on 2015 census data that 12.2% of US households are food insecure. When employing the presence of a grocery store in a low-income area as a key marker of food security in the US, 10% of white Americans are food insecure compared to 21% of African Americans and 19% of Latin Americans (Coleman-Jensen et al., 2016).

*Statistics Canada* (CCHS, 2015) divides food insecurity in to three types: marginally food insecure, moderately food insecure, and severely food insecure. Marginal food insecurity consists of worrying about running out of food and limited variety due to
lack of money. Moderate food insecurity consists of compromising quality and quantity of food due to lack of money. Severe food insecurity consists of skipping meals, rationing, reducing food intake, and going without food. Tarasuk et al. (2015) showed that compared to the average annual healthcare expenditures for food secure individuals ($1608.00), the average annual healthcare expenditures for marginally food insecure individuals ($2161.00), moderately food insecure individuals ($2806.00), and severely food insecure individuals ($3930.00), were increasingly higher.

Freeman (2007) coined the term “food oppression” to refer to the lower density of grocery stores and higher density of fast food restaurants in low-income and minority communities. Living in an area with a lower density of grocery stores and a higher density of fast food restaurants is positively associated with elevated rates of obesity (Maddock, 2004) and cardiovascular events (Alter & Eny, 2005). Further research shows that adults living within the same census-tract as a supermarket were less likely to suffer from obesity than adults who did not (Morland et al., 2006). Freeman specifies that it is African American and Latino communities who are hit hardest by the lack of fresh food accessibility coupled with the overabundance of fast food options. She further points to the invasion of public school cafeterias by the fast food industry who prey on schools in low-income areas desperately in need of funding, as another key element of food oppression. Federal food policy, government subsidies to fast food corporations, targeted marketing of African Americans and Latinos, and the infiltration of fast foods into school
cafeterias are all contributing factors to the negative health outcomes observed in low-income and minority communities.

2.3. Food Deserts

Inner city store closures and the growth of chain stores on the outskirts of the inner cities, also referred to as grocery store “red-lining,” have contributed significantly to the creation of food deserts (Guy et al., 2004). The expansion of chain stores has resulted in the closing of smaller local grocery stores. During the 1970s and 1980s, a mass exodus of more affluent households leaving the inner cities for the suburbs coincided with the closures of more than one half of supermarkets in the three largest US cities (Walker et al., 2010). Walker et al., also point out that inner cities have become less desirable areas to conduct business due to the negative public perception that these areas are ridden with crime. Other factors in the making of food deserts include the large size and costs of urban space required for full-scale grocery stores, as well as zoning laws and the fragmentation of property into smaller more easily sold pieces of land.

The initial response from food environment researchers was to suggest the introduction or re-opening of full service grocery stores in food deserts (Cummins & Macintyre, 2002; Zenk et al., 2005; Walker et al., 2010). Considering that the key problem of food deserts and food oppression is the lack of accessibility of fresh healthy foods, such a solution would appear to be practical. However, the two
earliest studies on the effects of introducing grocery stores into food deserts - one in Leeds (Wrigley et al., 2003) and the other in Glasgow (Cummins et al., 2005) - show opposite results. Wrigley et al., researching in Leeds, found that fruit and vegetable consumption increased most acutely in the poorest segment of the population following the opening of a grocery store in a low-income area, while Cummins et al., studying in Glasgow, found no such increase in fruit and vegetable consumption.

Two more recent studies on the effects of opening a grocery store in what previously was a food desert have not supported the claim that the introduction of grocery stores into food deserts would reduce obesity or increase fruit and vegetable consumption. Cummins et al. (2014) studied the effects of introducing a grocery store in to a food desert in a low-income mostly African American community in Philadelphia. After the grocery store had been open for one year, there were no significant effects on the consumption of fresh fruits and vegetables or on the BMI (measuring obesity) of local residents, although residents did report a significantly improved “perception of food accessibility.” The specific grocery store they studied in Philadelphia had been developed using subsidies from the Healthy Food Financing Initiative of the White House Task Force on Childhood Obesity, which allocated 400 million dollars in Federal funding to fight obesity and illness related to poor nutrition in low-income communities. Policy-makers in the United States have thus far demonstrated that the introduction of new grocery stores into food insecure areas is the preferred method of choice for improving food security in
low-income communities. This method of response is also the foundation of New York City's Food Retail Expansion to Support Health (FRESH) program.

Cummins et al. (2014) found was that only 26.7% of the residents had adopted the newly opened grocery store, with 51.4% using it only on occasion. The researchers suggested that the lack of adoption of the new store by local residents could have resulted from community resistance to the new supermarket development, that it did not offer a store-based credit card or credit arrangement, and most importantly, that there was community concern over the affordability of the new supermarket. Thus, this research group concluded that introducing grocery stores into food deserts and food insecure areas was not sufficient enough action on its own to significantly reduce the negative health outcomes associated with low-income communities.

What Cummins et al. (2014) appear to have possibly overlooked in their study was that the community had concerns over the affordability of the grocery store that had been newly introduced in the food desert. The higher cost of the grocery store certainly deterred many otherwise willing shoppers from adopting the new grocery store. It follows that food affordability is a crucially important issue of concern for low-income households and communities. Another important point of interest in the aforementioned case is whether or not the newly introduced grocery store was culturally accessible to the local low-income residents, which often times is not the case with higher cost grocery stores.
A separate study conducted in Portland, Oregon, by Sullivan (2014) also highlights the important of low prices as well as the importance of cultural accessibility for grocery stores opening up in food deserts. Upon the introduction of a high cost grocery store into a rapidly gentrifying neighborhood in Portland, which had previously been a food desert for almost two decades, Sullivan found that although affluent White residents were quick to adopt the new store (60.3% Weekly), Latino residents (33%) and Black residents (15%) were much less likely to adopt the new store. When considering that the bulk of the new home-owning residents of the neighborhood were White, this further shows that the new grocery store was not adequately serving the Latino, Black, and low-income community members that had been living there prior to gentrification. Sullivan further suggests that potential shoppers may perceive “symbolic boundaries” based on class and race in regards to what he called “the mind-body semiotics” of the high cost health food grocery store.

2.4. Other Factors That Influence Food Shopping Location

Three recent studies have showed low-income individuals typically travel over 1.6 km past the nearest grocery store to their home to buy food (Cannuscio et al., 2013; 2014; Shannon, 2016). This extra distance traveled for food shopping is certainly not only due to the price of food, although that is very likely to be the primary motivation. Cannuscio et al. (2013) concluded that, “proximity [to a particular grocery store] was not the primary driver of store choice” (p. 609). This conclusion
is particularly noteworthy in the context of the current research on food mirages as it affirms the idea that all grocery stores are not created equally and that more expensive grocery stores – which are by definition found in food mirages - may deter low-income shoppers by dint of their price point alone.

Aside from food prices, other factors that help explain the extra distance traveled to acquire food include doing so for better food quality, specialty food items, the acceptance of food stamps, store credit arrangements, and if the grocery store was close to a workplace, school, or on a bus route frequented by the individual (Shannon, 2016). Grocery stores in lower-SES areas also have significantly shorter hours of operation (Chen and Clark, 2013). Using a model referred to as the “uncertain geographic context problem,” Chen and Kwan (2015) describe how the inconsistent findings on food shopping at local grocery stores in low-SES areas, as well as the inconsistent findings of the effects of introducing grocery stores into food deserts, can be influenced by the temporality of the food environment in terms of limited store hours as well as lack of personal free time to shop. Shannon (2016), researching the shopping patterns of low-income individuals in Minneapolis, shows that the perceived risk of crime in low-income areas is a significant factor in deciding where to shop, driving many low-income residents to shop further away from their homes.

Further research by Cannuscio et al. (2014) focuses on using Human Behavioral Ecology (Story et al., 2008) to interpret the decisions of low-income households of
where to purchase food. This social-ecological approach gives less importance to
the influence of the physical environment and greater importance to the social
environment. Using this approach, these researchers found that people shop where
other people who share similar characteristics with themselves shop, suggesting
that race, ethnicity, socioeconomic status and family-size play an important role in
shopping location. They found that Whites are 7 times more likely to shop at high-
end food stores, while Non-whites are 2.7 times more likely to shop at discount
grocery stores. They show that the college-educated are 4 times more likely to shop
at high-end food stores, while the non-college educated are 3.5 times more likely to
shop at discount grocery stores. Those with incomes above $25,000 are 10 times
more likely to shop at high-end stores. “The urban food environment shapes and
reinforces social stratification... sorting by ethnicity, race, and SES... in the process
of selling and procuring food,” (p. 18) state the authors while pointing to the
disparity in negative health outcomes associated with this “socio-demographic self-
sorting” (p. 16). The “symbolic boundaries” based on race and class that Sullivan
(2014) describes in his study of the new high cost grocery store opening up in the
gentrified neighborhood in Portland also reflect this social-ecological approach and
show how certain grocery store types – for example “mind-body” health food stores
- may be more prone to creating or contributing towards a food mirage.

2.5. Diet Quality and Socioeconomic Status
A key contributing factor to the issue of nutrition-related health outcomes in low-income communities is diet quality. How do the diets of low-income communities differ from the diets of those with higher income? Research supports the notion that diet quality follows a socioeconomic gradient (Drewnoski & Spectre, 2004; Beydoun et al., 2008; Darmon & Drewnoski, 2008).

Darmon and Drewnoski (2008) describe the specific differences of the lower-SES and higher-SES diets. Through a review of European and North American research literature, these authors found that although lower- and higher-SES demographics consumed roughly the same proportions of fruits, vegetables, grains, meat, and dairy products, the specific forms and quality of each food group differed significantly. While higher-SES diets consisted of fresh fruits and vegetables, lean meats, low-fat dairy and whole grain breads and cereals, the diet of those with lower-SES consisted of greater proportions of canned fruits, fruits juices, frozen vegetables, processed and/or fattier meats, high-fat dairy and refined grains and cereals. In the lower-SES diet, foods contain more preservatives, as well as higher salt, higher fat, and higher sugar content than do the foods making up the higher-SES diet. Anthony Winson (2013) of the University of Guelph suggests that the high-fat, high-salt, high-sugar “industrial diet” is the primary culprit responsible for the proliferation of nutrition-related health problems in society, including obesity, diabetes and cardiovascular disease. Drewnoski and Spectre (2004) show that these high-fat, -salt, and -sugar processed foods are both high in energy density (measuring by total quantity of calories) and low in cost, whereas fresh fruits and
vegetables in particular are much lower in energy density and have a considerably higher cost per calorie. Furthermore, these highly processed foods are sold at convenience stores, fast food restaurants and school cafeterias, making them the most highly marketed and omnipresent of all food types, while also being the most affordable, when measuring calories per dollar.

Pierre Bourdieu, in *Distinction* (1984), detailed his own research on the differences in food tastes and diet of the different social classes in mid-twentieth century France. He found, similarly to Darmon and Drewnoski (2008), that the higher up the social class hierarchy one observed, the higher the consumption of fresh fruits and vegetables, lean meats and low-fat dairy. Conversely, Bourdieu observed that the working classes consumed a diet consisting primarily of heavier foods such as pasta, potatoes, beans as well as fattier meats and dairy products.

Mullainathan and Shafir (2013), in their book *Scarcity*, describe how the ongoing financial stress of living with a low-income, affects cognitive capacity and problem solving. They state that the constant preoccupation with financial stress depletes one’s “mental bandwidth” by reducing the capacity to deal with other cognitive tasks. In the context of the present discussion on fresh food consumption and diet, the reduced cognitive capacity could potentially have a negative impacts of healthy food choices. Furthermore, Mullainathan and Shafir observe that under the duress of ongoing financial stress, one’s awareness of relevant price-related information becomes heightened. They found that lower-income persons had much more
accurate knowledge of food and retail prices, concluding that since lower-income persons, out of necessity, need to stretch each dollar further than those with higher incomes, their price knowledge was much more accurate.

2.6. Cultural Capital and Healthy Food Choices

Another way to interpret diet quality, healthy food choices, and nutrition-related health outcomes is in terms of the advantage in cultural capital or ‘cultural head-start’ that middle and upper class households maintain over lower class households in regards to nutritional knowledge. In Distinction (1984), Bourdieu describes cultural capital as the informational and symbolic knowledge that a person has acquired as the result of their socialization and time spent devoted to acquiring particular areas of knowledge. Research by Kamphuis et al. (2015) highlights the positive association between cultural capital and making healthier food choices. These researchers found that factors including one’s parents having a university education (institutionalized cultural capital), owning a juicing machine (objectified cultural capital), and possessing cooking skills (embodied cultural capital) were all positively associated with making healthier food choices. The healthier food choices included the preference for whole grain bread and cereal products, the preference for less fatty meats as well as the habit of avoiding snack foods. Participants with lower aggregate levels of cultural capital made less healthy food choices. Thus, middle and upper class households are thus able to socialize the “taste” for healthier foods from an early age, while lower class households are not able to do the same,
and often can only afford basic necessities, which Bourdieu referred to as the “taste of necessity.” Bourdieu, writes,

> The idea of taste, typically bourgeois, since it presupposes absolute freedom of choice, is so closely associated with the idea of freedom that many people find it hard to grasp *the paradoxes of the taste of necessity*. Some simply sweep it aside, making practice a direct product of economic necessity (workers eat beans because they cannot afford anything else), failing to realize that necessity can only be fulfilled, most of the time, because the agents are inclined to fulfill it, because they have a taste for what they are anyway condemned to (Bourdieu, 1984, p.177-178). [Emphasis added]

The “paradox” of the taste of necessity, that Bourdieu describes, is that in the absence of the freedom to choose – for example, between healthier foods and low-cost energy-dense foods - there is no possibility to develop “taste,” for taste relies upon a freedom from urgency. The lower classes are “condemned” to eating what are basic necessities, rather than having the choice of eating fresh healthy foods, which make up the typical upper class diet. In the context of present-day Canadian food insecurity, the idea of the “taste of necessity” may certainly pertain to cases where households are dependent on food banks and purchasing basic necessities, when viewed in comparison to the relative consumer freedom, regarding food purchasing, of the average Canadian.
2.7. Conclusion

The term “food mirage,” coined by Short et al. (2007) is relatively new to the world of sociology, referring to areas where the high cost of foods acts as a barrier to food access for those living with low-incomes. Everett et al. (2011), suggested that food mirages are similar to food deserts in there negative impacts on physical health. Although several studies since have focused on food mirages specifically, only one study, by Breyer and Voss-Andreae (2013), undertook the process of compiling a Food Affordability Index to rank the grocery stores according to their cost, and mapping the results of the food environment. Breyer and Voss-Andreae’s Portland-based study will thus serve as a model for the first part of the present study, aiming to map the food mirages of Guelph, Ontario.

Food Insecurity in is a major problem for those living with low-incomes in Canada, as 12% of Canadians are currently living with it (CCHS, 2015). Furthermore, food insecurity disproportionately affects indigenous and minority communities (CCHS, 2015; Coleman-Jensen et al., 2016). The experience of food insecurity is only exacerbated by the present of food mirages and food deserts. (Cummins & Macintyre, 2002; Zenk et al., 2005). Minority and poor communities, not only home to a preponderance of food deserts, are also home to a higher density of fast food restaurants, and thus experiences what Freeman (2007) calls “food oppression.” Further research showed that living in the same neighborhood as fast food restaurants increased the likelihood of negative health outcomes (Maddock, 2004;
Alter & Eny, 2005), living in the same neighborhood as a full-service grocery store reduced them (Morland et al., 2006).

Yet still, improvements in health and in fresh food consumption were not uniformly observed when grocery stores were introduced into what had previously been a food desert (Wrigley et al., 2003; Cummins et al., 2005; Cummins et al., 2014), highlighting the need to consider the cost and affordability of grocery stores, especially when introducing one in to a low-income neighborhood. Other research shows that low-income individuals typically travel much further than the grocery store closest to their home in order to purchase food, for reasons of affordability and quality, transit options and proximity to work and school (Cannuscio et al., 2013; Cannuscio et al., 2014; Shannon 2016). Social-ecological factors, which include the desire to shop with those who are of similar socioeconomic status, race or ethnicity also proved to be significant in influencing shopping choices (Cannuscio et al., 2014; Sullivan, 2014). Crime and personal safety (Shannon, 2016), as well as free time and hours of operation (Chen & Clark, 2013; Chen & Kwan, 2015) also play a role in determining shopping choices.

Still, living within a food desert or not, regardless of where they shop, low-income households consume less fresh healthy foods than higher-income populations (Darmon & Drewnoski, 2008). This is due primarily to the reality that low-income households often lack the economic capital to afford more expensive healthier fresh foods and rely on low-cost energy-dense foods that are high-fat, high-salt and high-
sugar (Drewnoski & Spectre, 2004). Food choices can also be affected by financial stress as Mullainathan and Shafir (2013) demonstrate in their findings that financial stress reduces one’s “mental bandwidth,” and increases the degree that one discounts the future (including future health).

Bourdieu (1984), whose studies of mid-twentieth century French culture, found that the French lower class had an almost identical diet to the lower classes of the more recent studies of Western Europe and North America. His observations on the contributions of lower levels of cultural capital to less healthier food choices have been reproduced in more recent research (Kamphuis et al., 2015). He also posits the notion that the poor dietary quality of the lowest class results from a “taste of necessity,” or a distinct lack of choice in regards to food selection.

In consideration of the above research, when evaluating food environments it is of vital importance to consider food cost and affordability in addition to food proximity and location. Opening a high-cost store in a low-income area will do little to change the food accessibility of the local residents.

Separately, in designing the research interview and survey questions for this study, it is important to consider many of the factors discussed above - such as social-ecology, symbolic boundaries, transportation options, food quality, cultural capital, and more – in order to broaden the scope of the research and not miss key topics.
3. Methods

This research project has two distinct stages, each with its own data analysis stage. The first stage of the research was to compile an affordability index for the full-service grocery stores in Guelph and then to create a series of maps of the food environment in Guelph based on the affordability index, in order to highlight the food mirages and food deserts present in the city. The second phase of the research was to interview and survey 15 Guelph residents living close to or below the Low Income Cut Off (LICO) to explore the impacts, challenges, and strategies for facing limited access to affordable food and/or food insecurity, experienced in the local food environment with its omnipresent food deserts and mirages.

3.1. Food Affordability Index

The purpose of compiling a Food Affordability Index for the various full-service grocery stores in Guelph, was not only to get a clearer understanding of the rank of each store in comparison to one another, but to be able to visualize the food environment in a way that shows precisely where high-cost, mid-cost and low-cost grocery stores are located, in order to help identify not only food deserts, but specifically to be able to identify food mirages. The Food Affordability Index thus allows us to avoid the pitfall of treating every grocery equally by assuming that they are equally accessible to all shoppers. Especially when discussing food insecurity and food accessibility, it is important to gather data on the price point of each store
As price is the primary factor in determining whether low-income households adopt a store.

To compile the composite affordability index, I employed the Ontario Ministry of Health’s Nutritious Food Basket to provide a list of 67 food items for which to collect pricing information from each store. According to the Ontario Ministry of Health,

A Nutritious Food Basket (NFB) is a survey tool that is a measure of the cost of basic healthy eating that represents current nutrition recommendations and average food purchasing patterns. Food costing is used to monitor both affordability and accessibility of foods by relating the cost of the food basket to individual/family incomes... The basket is designed to reflect an example of an eating pattern that meets Eating Well with Canada’s Food Guide, and eating behaviors reflective of the Canadian Community Health Survey 2.2 results... Items in the NFB reflect the lowest price available in a specified purchase size, regardless of brand (Ministry of Health, 2010).

Firstly, I included all of the grocery stores in Guelph that had over 80% of the items on the NFB list as full-service grocery stores. By this measure, four grocery stores were excluded. Those excluded where the Giant Tiger, the Himalayan Market downtown (which had less than 50% of the items), as well as Taskgo and Tan Phat, which are two specialty Asian Grocery stores. In retrospect, I should have included the Taskgo and Tan Phat due to their popularity, but since they are on the periphery
of the city and at a great enough distance (>1km) from any residential area, the omissions cannot be seen as compromising the final results for the scope of the present study.

Primarily, I employed the NFB as a checklist of food items and quantities by which to perform a price comparison between stores. One small amendment that I made to the NFB food item list was that I removed “cookies” as an item because I was unable to find similar types of cookies at each store and found the prices to have an unusually high variance. Thus, my minutely amended NFB listed 66 items instead of 67.

Using the NFB as a checklist, I walked through the aisles of each grocery store in Guelph collecting the prices and quantities for the cheapest available option of each food item, including sale item prices. I chose to use the price point for smaller- and medium-sized quantities rather than including the larger “bulk” prices, from the understanding that very low-income individuals are typically not bulk shoppers. I included medium-sized items if the price was cheaper per gram than the smaller sized option. For fresh fruits and vegetables, I not only took down the price but also weighed each item as the NFB specifies quantities in units of grams or kilograms.

Some of the larger scale grocery stores had prices listed in dollars per gram in smaller print on the shelf label. In such cases, I used the cheapest available dollars per gram price point. If dollars per grams amounts were not listed on the shelf label
I copied the price and quantity (in grams) of the item and calculated the amount listed on the NFB.

Since most of the larger full-service grocery store chains have multiple stores in Guelph, and since stores of the same store name share the same pricing (and flyers), I was able to collect the NFB prices from one store and apply the same values to the other stores of the same name. For example, after collecting the prices from one Food Basics Inc., I did not then collect price information from the two other Food Basics’ in Guelph, but simply used the initial Food Basics data for all three stores. This principle could not be applied to small-scale local food stores.

I included all of the full service grocery store chains located in Guelph in my analysis with the exception of Longo’s and Costco. Firstly, Longo’s was omitted because it was not yet open for business at the time of data collection, so was not intentionally omitted. Since Longo’s is located at the same intersection as a Food Basics and a Zehrs, the map itself would be essentially unaltered by the addition of the Longo’s due to it sharing the same geographic space as two other much cheaper options. Costco was intentionally omitted because it is a bulk purchase grocery store that requires customers to purchase a membership. Since the very low-income population is much less likely to make bulk purchases, let alone shop at a bulk grocery store, Costco was omitted. The omission of Costco is unlikely to affect the viability of the food environment map because it is directly across the street from a Zehrs (sharing a similar price point to Zehrs) and it is located on the very Western
most edge of the city. (In hindsight, I recognize that I should have included Costco just to produce a complete analysis. None of the 15 participants mentioned doing any shopping at Costco although every other store in the Guelph was mentioned by name.)

One small-scale health food store, the Stone Store, located in downtown Guelph was omitted due to the owner’s decision. In fact, the owner of the Stone Store was the only store owner that I approached to ask permission to collect price points from. Since the Stone Store is an “organic” food store – and one that I am very well personally acquainted with – I am certain that it is no cheaper than the other small scale high-cost grocery store across the parking lot at the same location, named Market Fresh. Since I am in full confidence that it is one of the most expensive stores in town, due to it’s focus on “organic” food products, I am certain that it’s omission is of no great consequence to the study.

3.2. Food Environment Mapping

To map the food environment, I used ArcMap software and ArcGIS online (Business Analyst Online version), to create a series of maps of the food environment in Guelph, in order to highlight the food mirages and food deserts across the city. Using the Food Affordability Index, grocery stores were divided in to three categories (low-cost, mid-cost, and high-cost) and color coded on the maps, thus
displaying the food mirages, which are based on food affordability level, as well as the food deserts, which are based on proximity alone.

In pinpointing the grocery store locations on the maps, I opted to use precise latitudinal and longitudinal coordinates instead of street addresses, due to the fact that many grocery stores have large parking lots, some that span up to 200m in walking distance. Thus, that extra walking distance is not omitted in these maps.

A central feature of the map-making process was to use the “walk distance” feature available in ArcGIS online (Business Analyst Online version), to show the 1 km walking distance polygons from each grocery store. Displaying the walk distance polygons shows precisely which street addresses are within a 1 km walking distance from each store, unlike when using a 1km radius from the grocery store, which I found to include significant variance in actual walking distance. For example, there were some areas of Guelph where a particular house address was located within the 1km radius of a store, but had an actual walking distance of 1.8km, given the specific layout of the street geography. In fact, this differential between straight line distance (radius) and walking distance based on the actual street geography was not uncommon to see, thus using the “walking distance” option (or “Drive Time” option, which is another name for it) proved to be of much greater precision than did the radii.
Another notably feature of the maps is the inclusion of a color-coded display of the prevalence (or proportion) of persons living below the Low Income Cut Off (LICO) by dissemination area, which is the smallest geographic level at which income information is publicly available. According to Statistics Canada, a census dissemination area typical contains 400 to 700 people. In the specific case of Guelph, a dissemination area typical spans about 5 city blocks, although there are some that span a much greater distance and include more than 700 people.

Through the combination of the dissemination census boundary file (Statistics Canada, 2011) and the 2016 Census Profile, the maps also show the prevalence, by dissemination area, of residents living below the Low Income Cut Off (LICO). The LICO is a measure of poverty in Canada that represents those with an annual income of approximately $5000.00 less than half of the median income. The LICO is the income line at which a household must spend the great majority of its income on basic necessities, such as rent, food, and cloths, according to calculations based on the Consumer Price Index (CPI). Typically, those living below the LICO are likely to experience food insecurity, while those living above the LICO typically do not. Since the participation criterion for the study interviews specified individuals living below the LICO, this statistic connects to that aspect of the study. Using the LICO Prevalence statistic from the 2016 Census Profile here highlights the specific areas of the city where there are greater proportions of persons who have very low-incomes and are more likely to be food insecure. Thus, the maps showing LICO prevalence highlight food insecurity across the city.
3.3. Interviews and Short Survey

The second part of the thesis research consists of semi-structured interviews and short surveys in order to produce both qualitative and quantitative data regarding local residents experiences with food affordability, accessibility and insecurity. By using semi-structured interviews, all participants interviewed were asked the same questions, thus producing comparable qualitative and quantitative data. The surveys also provided comparable quantitative data.

The interview and survey questions were designed to collect information about individual's experiences with food affordability, accessibility, and insecurity. Many questions were formulated to produce feedback relevant to many of the theories from the research literature review above in the introduction.

3.3.1. Research Ethics

A University of Guelph Research Ethics Board application protocol was successfully completed in the spring of 2017 (University of Guelph REB#17-03-035) for the interview and survey questions. A second Research Ethics Review was later completed with the Guelph Community Health Centre prior to usage of their office space to conduct the interviews.

3.3.2. Sample
Fifteen adult Guelph residents earning an income close to or below the Low Income Cut Off (LICO) were recruited to participate in the roughly 60 minute interview sessions, with an accompanying 5-minute survey. I aimed to recruit a representative sample, including single parents, elderly, persons of color, and indigenous persons. The inclusion criterion listed on the recruitment poster stated that participants must be adults living below the LICO, although and error was made on the recruitment poster regarding the precise value of the LICO (see more below in “Recruitment”).

One group that I specifically did not target was the university student population, as I defined that population as being “temporarily poor” in the sense that most students, despite living with little income, come from middle-class backgrounds and will gain a credential in short order by which to join the professional workforce. As a university student myself, I understand that students have access to student loans as well as special student credit cards and lines of credit that the general public do not have available. Students also have student food banks, emergency bursaries, and special grants and scholarships available to them that the general public do not. Typically, part of the student life-style is to go in to debt in order to maintain a decent quality of life, under the assumption that one will pay off the debts when they begin working upon graduation. Thus, although many students are living with a low-income and some are even yet legitimately food insecure, I am drawing a
distinction between their level of food insecurity and that of the general adult low-income population.

### 3.3.3. Recruitment

The Ontario Works (social assistance) office in Guelph assisted me in recruiting from their client base through putting up posters in their two downtown offices. One of their caseworkers further helped to recruit some participants directly. The Guelph Community Health Centre, which serves the low-income population of the city and is located in the downtown area, allowed me to put up recruitment posters in two of their buildings. One of their dieticians further promoted the study directly to their client base. Furthermore, I put up recruitment posters in the Guelph Public Library, the Drop-In Centre (a local soup kitchen), the Onward Willow Centre (located in a social housing division), a non-profit old folks home, and a local Coffee Shop downtown. In all cases, permission from management was granted prior to putting up the recruitment posters.

The recruitment posters themselves contained a basic description of the study and an email address for contact. “Financial Compensation Provided” was listed on the recruitment poster and each participant received $20.00 cash compensation for their time and efforts. I was initially advised to provide gift cards or vouchers for grocery stores as compensation, but since the participants lived in different areas of the city it would have been difficult to pick one store that applied to every
participant’s practical needs. Any doubt that I could have had about providing financial compensation was alleviated when two of my initial participants had traveled over 30 minutes by bus one-way to attend the roughly 60 minute interview session. I wish that I had more money to offer participants considering the amount of their time I was asking for.

One error was made on the recruitment poster. Although it stated that participants must be earning an income below the LICO, the LICO value listed on the poster was wrongly reported as $24,600 for individuals, etc. The LICO was reported by the Government of Canada (2015) at $17,240 for individuals, and therefore two of the fifteen participants had incomes slightly above the LICO, but still very close to the 2015 Low-income Measure (LIM) of $22,133, which is calculated as half of the nationwide median income. (Those two slightly higher income participants provided very useful data nonetheless.)

3.3.4. Location

The interviews took place at the Guelph Community Health Centre in the Opera House Room, in the evenings after regular office hours had ended. I completed a Research Ethics Review protocol with the Lead Health Planning and Program Evaluator at the Guelph CHC in October 2017 and was kindly granted cost-free use of the room for the fifteen interview sessions by one of the Directors of the CHC.
The interviews were completed between October 17\textsuperscript{th}, 2017 and December 5\textsuperscript{th}, 2017.

3.3.5. Confidentiality and Consent

Each interview was recorded on an encrypted recording device. The interviews and the survey did not contain any requests for personally identifying information such as names, addresses or dates of birth, although personal non-identifying information such as gender, income, age, ethnicity, and closest major intersection to residence were requested.

The interviewer established informed consent with each participant prior to the beginning of the survey and beginning of the recorded interview. The interviewer not only read aloud a consent script but also had each participant read over the consent form prior to the interview session. The interviewer repeatedly offered to answer any questions about the research and its associated procedures upon initial recruitment response via email, as well as prior to the commencement of the survey and interview session.

Extensive notes were taken during the interviews as the interviews were not transcribed. The interviews were then used as a reference throughout the data analysis stage, to check quotations for accuracy and context.
3.4. Surveys

The survey was designed to collect basic demographic information such as age, gender, ethnicity, education, income, employment status, monthly food budget, etc. This information can be more awkward to address aloud. The survey also contained several questions about shopping frequency, food choices, and diet quality, thus providing some important quantitative data to explore.

The survey questions were submitted in the same University of Guelph Research Ethics Board protocol as the interview questions (University of Guelph REB#17-03-035).

4. Data Analysis

4.1. Food Affordability Index

The Food Affordability Index was calculated by taking the sum of the prices of the items making up the Nutritious Food Basket (NFB) for each grocery store. The store with the lowest total cost of NFB items was given a score of 1 and represented the baseline by which all other store comparisons were made. All other stores, based on the sum total of NFB items, were given a score relative to the least expensive store. For example, a store who's total NFB cost is double that of the least expensive store, was given a score of 2. Each grocery store received a score, which could easily be interpreted as a factor, as described in the aforementioned example.
For stores that did not contain the full list of NFB items, average prices of the missing items were imputed. Imputed scores were designated to reduce the overall variance of having a multiplicity of items listed with no price. The imputed prices were calculated as the average price of the same items at all other stores, with the exception of organic health food store prices in the specific cases where the imputed item was located at a conventional grocery store (that did not focus on organic foods). In cases where the imputed items were located at organic health food stores, the imputed price was calculating using the average price from all stores together.

One specific point of interest here, which was used to guide some of the analysis, was the ability to separate the NFB list in to food types, for example “meats” or “fresh fruits and vegetables.” By doing this, I was able to analyze which grocery stores offered the cheapest fresh produce or meats. I was also able to see how specific food types affected each stores’ overall index score.

4.2. Food Environment Mapping

The completed maps display the areas in the city of Guelph hardest hit by a lack of accessibility to affordable food. These maps display grocery store cost level across the city, with 1 km walk distance buffers to those stores, while also highlighting areas have the higher prevalence of <LICO residents. By visualizing the food environment in this way, we are not only able to specifically locate problem areas,
but we are able to see how pronounced and widespread food mirages and food deserts are across the entire city.

For this series of maps, I established a 1km walking distance from a grocery store as the measure of a food desert’s boundary, as is consistent with other earlier studies in Canada (Apparicio et al., 2007; Larsen & Gilliland, 2008). Another more recent study employs a 500m walking distance as their preferred boundary measure stating that 500m is a “reasonable” distance for someone to walk considering the burden of carrying groceries and the possible accompaniment of children (Slater et al., 2014). The USDA – and many researchers in the US - employs a 1 mile (or 1.6km) boundary measure for food deserts.

Although there is only scant research on food mirages in Canada and the US, I see no reason to deviate from the 1km walking distance boundary measure used for food deserts in many Canadian studies in order to measure food mirages. Again here, Breyer and Voss-Andreae (2013), researching in Portland, Oregan use the USDA measure of 1 mile (1.6km) to measure the food mirage boundary, while Weibe et al. (2016), researching in Winnipeg, Manitoba, use a tiered system from <500m, 500-1000m, and >1000m, with the last option (>1km) representing “low physical access.”

Thus, when analyzing these food environment maps, we should be aware that all of the low-income residents outside of the 1km walk distance polygons are living in
food deserts. Furthermore, all or the low-income residents outside of the 1km walk distance polygon to a “low-cost” grocery store are living in a food mirage. When including food mirages in our overall food environment calculus, one will note that the area of restricted food accessibility is much greater than the food desert only map.

4.3. Interviews

The interview questions were constructed to explore the impacts of each participant’s experiences with food accessibility, affordability, and insecurity. The list of 26 interview questions (see Appendix 10.3) were focused on establishing a clear understanding of each participant’s:

1) General geographic location in the city: In conjunction with the participant’s preferred shopping location, this information determines their typical distance traveled for food shopping, which could demonstrate how much further a participant traveled beyond the nearest store to their neighborhood, in order to food shop. This is particularly relevant when evaluating food mirages.

2) Awareness of variations in affordability and food quality of stores: Establishing to what degree is the affordability of specific stores understood and/or common knowledge as well as how different grocery stores food quality is perceived.
3) Preferred choice of grocery stores: This helped determine where exactly participants shopped in relationship to their own neighborhoods as well as to the food stores closer to their neighborhoods.

4) Frequency of food shopping: This can be interpreted as a proxy for fresh food accessibility, due the reality that fresh food spoils relatively quickly, therefore the more frequently one shops the more fresh food one may potentially acquire.

5) Type of transportation used for food shopping: Exploring the diversity of transportation options employed by low-income households, which are influenced by a multiplicity of other factors, while focusing on public transportation.

6) Alternative sources of food: All non-grocery store bought food such as food from a garden, food bank, local farm, etc.

7) Healthy food choices: Demonstrates the participant’s nutritional knowledge and personal motivation for healthy eating.

8) Strategies for obtaining an adequate amount of food/healthy food: Demonstrates the multiplicity of common and uncommon ways that participants employ to ensure that they acquire adequate food despite the challenges they face.

9) Perceived barriers to obtaining adequate healthy food: Identifying the barriers to eating a healthy diet that participants face.

10) Personal diet-related health concern: Identifying specific concerns related to health, diet, and nutrition.
11) Descriptions of the social ecology of different grocery stores: Exploring the
descriptions of the cultural environment and differences
between various grocery stores as well as exploring their personal feelings
and experiences with discrimination/racism.

12) Usage and experiences with emergency food services: Exploring
participant’s history of usage and/or volunteering with food banks and soup
kitchens.

13) Personal experience with food insecurity: Descriptions of their personal
challenges with lack of adequate food, rationing and skipping meals.

14) Stress levels/subjective feelings regarding food affordability and
accessibility: Exploring how participants deal with food-, health-, and
financial-stress and how it commonly manifests in their lives.

Most of the interview questions were constructed to address various issues
previously established by food environment researchers that were addressed in the
introduction section and will be addressed accordingly in the results and discussion
sections.

The real depth of detail of the interviews was found in the participant’s descriptions
of their own life experiences with food insecurity, thus the most important data
from the interviews is qualitative in nature.
With a sample size of 15, the data were analyzed with univariate and bi-variate statistics.

4.4. Surveys

Despite the limitations noted above, the survey nevertheless included important questions regarding demographic information – such as sex, age, ethnicity, education, and annual income. Information about food shopping frequency, weekly and monthly food budgets, and perception of grocery store affordability in downtown Guelph were also included in the survey to supplement similar questions in the interview. Furthermore, the survey includes a number of questions regarding frequency of emergency food services usage, fresh fruit and vegetable intake versus processed fruit and vegetable intake, and restaurant frequency. Notably, fresh fruit and vegetable intake is a marker of healthy eating and in the current study is considered a key marker of diet quality. The quantitative data resulting from the survey will be interpreted using descriptive statistics to show general trends amongst the small sample of participants.

5. Results

5.1. Food Affordability Index
Table 1 displays the final results for the Food Affordability Index for Guelph, Ontario. The full table of the prices of individual food items at each store can be found in Appendix 10.1.

**Table 1.** Food Affordability Index Scores and Total Cost of Nutritious Food Basket.

<table>
<thead>
<tr>
<th>Grocery Store</th>
<th>Food Affordability Index Score (FAIS)</th>
<th>Total Cost of Nutritious Food Basket (NFB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FreshCo</td>
<td>1.0</td>
<td>$207.03</td>
</tr>
<tr>
<td>No Frills</td>
<td>1.07</td>
<td>$222.13</td>
</tr>
<tr>
<td>Food Basics</td>
<td>1.08</td>
<td>$223.72</td>
</tr>
<tr>
<td>Walmart</td>
<td>1.11</td>
<td>$228.88</td>
</tr>
<tr>
<td>Metro</td>
<td>1.29</td>
<td>$267.64</td>
</tr>
<tr>
<td>Zehrs</td>
<td>1.33</td>
<td>$275.49</td>
</tr>
<tr>
<td>Angelino’s</td>
<td>1.72</td>
<td>$356.93</td>
</tr>
<tr>
<td>Market Fresh</td>
<td>1.85</td>
<td>$382.38</td>
</tr>
<tr>
<td>Goodness Me</td>
<td>2.36</td>
<td>$489.30</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td><strong>1.42</strong></td>
<td><strong>$294.83</strong></td>
</tr>
</tbody>
</table>

According to the results displayed above, we can observe that the difference in cost of the Nutritious Food Basket between the lowest cost grocery store, FreshCo ($207.03), and the highest cost grocery store, Goodness Me ($489.30), is $282.80. According to the Food Affordability Index Score for each, FreshCo has a score of 1.0 since, as the lowest cost grocery store it will act as the baseline, and Goodness Me has a score of 2.36, which we calculated by dividing the Goodness Me NFB total cost by the FreshCo NFB total cost. Another simple way to interpret this result is to say that Goodness Me is, roughly speaking, 136% more expensive than FreshCo.
FreshCo, No Frills, Food Basics, and Walmart are within 11% of the cost of FreshCo. Metro and Zehrs, with Food Affordability Index Scores of 1.29 and 1.33 respectively, are a significant jump up from the above named stores, being roughly 29% and 33% more expensive than FreshCo. Angelino’s (1.72) and Market Fresh (1.85) are a considerable jump up from all of the lower cost stores, at a 72% and a 85% higher cost than FreshCo. And lastly, Goodness Me, with a score of 2.36, has the highest score and ranks as the most expensive grocery store on our current list, at 136% more expensive than FreshCo.

Thus, dividing these grocery stores into three tiers (low-, mid-, and high-cost stores) is relatively simple. The four lowest cost stores (FreshCo, No Frills, Food Basics, and Walmart), all within 11% of the cost of FreshCo, will be labeled low-cost stores. Next, Metro and Zehrs, both over 29% higher cost than FreshCo, but within 4% of the cost of each other, will be labeled mid-cost grocery stores. Lastly, at much higher costs above the aforementioned stores, Angelino’s, Market Fresh, and Goodness Me will be labeled high-cost stores. Certainly Goodness Me could be in its

<table>
<thead>
<tr>
<th>Low-cost Stores (1.0-1.11 FAIS)</th>
<th>Mid-cost Stores (1.29-1.33 FAIS)</th>
<th>High-cost Stores (1.72-2.36 FAIS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FreshCo No Frills Food Basics Walmart</td>
<td>Metro Zehrs</td>
<td>Angelino’s Market Fresh Goodness Me</td>
</tr>
</tbody>
</table>

Table 2. Three-tiered Store Affordability Rankings
own extremely high-cost tier, but for the sake of simplicity here, it will be included within the already prohibitively expensive high-cost tier. Table 2 shows the three-tiered store affordability rankings.

Table 3 and 4 below display two separate scores calculated each from different sections of the Nutritious Food Basket for each store. The first score, calculated using all fresh fruit and vegetable items from the NFB, is the Fruit & Vegetable Affordability Index Score (Table 3). The second score, calculated using all meat items, is the Meat Affordability Index Score (Table 4).

**Table 3.** Fruit and Vegetable Affordability Index Score and Total Cost of Fresh Fruits and Vegetables (NFB).

<table>
<thead>
<tr>
<th>Grocery Store</th>
<th>Fruit &amp; Vegetable Affordability Index Score</th>
<th>Total Cost of Fresh Fruits and Vegetables (NFB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Frills</td>
<td>1.0</td>
<td>$51.40</td>
</tr>
<tr>
<td>FreshCo</td>
<td>1.02</td>
<td>$52.50</td>
</tr>
<tr>
<td>Food Basics</td>
<td>1.1</td>
<td>$56.61</td>
</tr>
<tr>
<td>Walmart</td>
<td>1.13</td>
<td>$57.93</td>
</tr>
<tr>
<td>Zehrs</td>
<td>1.5</td>
<td>$77.33</td>
</tr>
<tr>
<td>Metro</td>
<td>1.52</td>
<td>$78.35</td>
</tr>
<tr>
<td>Angelino’s</td>
<td>1.73</td>
<td>$88.90</td>
</tr>
<tr>
<td>Market Fresh</td>
<td>1.74</td>
<td>$89.44</td>
</tr>
<tr>
<td>Goodness Me</td>
<td>2.77</td>
<td>$142.48</td>
</tr>
<tr>
<td>Mean</td>
<td>1.5</td>
<td>$77.22</td>
</tr>
</tbody>
</table>
Table 4. Meat Affordability Index Score and Total Cost of Meat (NFB).

<table>
<thead>
<tr>
<th>Grocery Store</th>
<th>Meat Affordability Index Score</th>
<th>Total Cost of Meat (NFB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FreshCo</td>
<td>1.0</td>
<td>$63.35</td>
</tr>
<tr>
<td>Food Basics</td>
<td>1.05</td>
<td>$66.37</td>
</tr>
<tr>
<td>Walmart</td>
<td>1.05</td>
<td>$66.80</td>
</tr>
<tr>
<td>Metro</td>
<td>1.09</td>
<td>$69.19</td>
</tr>
<tr>
<td>No Frills</td>
<td>1.18</td>
<td>$74.58</td>
</tr>
<tr>
<td>Angelino's</td>
<td>1.27</td>
<td>$80.33</td>
</tr>
<tr>
<td>Zehrs</td>
<td>1.3</td>
<td>$82.57</td>
</tr>
<tr>
<td>Market Fresh</td>
<td>1.39</td>
<td>$88.24</td>
</tr>
<tr>
<td>Goodness Me</td>
<td>1.52</td>
<td>$100.75</td>
</tr>
<tr>
<td>Mean</td>
<td>1.21</td>
<td>$76.90</td>
</tr>
</tbody>
</table>

Firstly, the Fruit and Vegetable Affordability Index Scores (FVAIS) displayed in Table 3 show that No Frills is the lowest cost shopping option, therefore for this particular index, it is given the baseline value of 1.0. According to the FVAIS, the same four grocery stores are at the lowest priced end of the spectrum, within 13% of the total NFB cost of one another. Next, Zehrs (1.5) and Metro (1.52) are both roughly 50% more expensive than No Frills for fresh fruits and vegetables specifically. Angelino’s (1.73) and Market Fresh (1.74) are in the next tier above at almost 75% more expensive than No Frills for fresh fruits and vegetables. Lastly, Goodness Me (2.77) is 177% more expensive than No Frills for fresh fruits and vegetables, which is close to being three times more costly.

Next, the Meat Affordability Index Scores (MAIS) displayed in Table 4 shows that FreshCo has the lowest priced meats and thus acts as the baseline for the MAIS at a
score of 1.0. According to these scores, Metro (1.09) has bumped No Frills (1.18) out of the top four lowest priced store options, this time for meats specifically. Angelino’s (1.27), Zehrs (1.3), Market Fresh (1.39), and Goodness Me (1.52) round out the list.

The MAIS shows a much lower average index score at a mean of 1.21 than both the FVAIS mean of 1.5 and the FAIS mean of 1.42, demonstrating that meat prices have less price variance across different grocery stores than do the prices of many other food items, specifically those for fresh fruits and vegetables. On the other hand, the FVAIS mean of 1.5 shows a higher price variance than the MAIS mean of 1.21 and the FAIS mean of 1.42, demonstrating that the prices of fresh fruits and vegetables have greater price variance across different grocery stores than do meat prices as well as most other food items.

**5.2. Food Environment Mapping**

This section includes a series of maps that illustrate the food environment of Guelph, Ontario, emphasizing the widespread food mirages and food deserts across the city. Map 1 displays all of the full-service grocery stores in Guelph, color-coding them according to their Food Affordability Index Score as high-, mid- and low-cost stores. A key initial observation here is that we can see that in the center of the map, in the downtown area of the city (that is highlighted on the map), we find the two grocery stores with the highest FAIS values, which are Market Fresh (1.85) and
Goodness Me (2.36), both high-cost stores. Considering that there are no other grocery stores with a lower FAIS value within a 1km walking distance from any point inside of the downtown Guelph census tract, we may define the downtown area of the city as a food mirage. Again, downtown is not a food desert because there are some full-service grocery stores present, but rather it is a food mirage because the food that is present in those downtown stores is unaffordable and therefore its access is restricted for low-income residents. Food mirages occur in any of the areas where there are mid- to high-cost grocery stores located, without a neighboring low-cost grocery store present as well. The mid- and high-cost grocery stores are indicated by the yellow and red shades and thus may be easily identified.

It is notable that just East of downtown (to the direct right-hand side of downtown Guelph on the map), in an area of the city named the Ward, there is only one high-cost grocery store (Angelino’s 1.72), without any lower-cost stores within a 1km walking distance from any point in the Ward. Thus, the Ward is another significant food mirage in the city, only made worse by the observable fact that North (above) of the Ward there are no other grocery stores, thus demarcating a large food desert in the North-eastern end of Guelph. Furthermore, South-west (below and left) of the downtown area is another large expanse with no grocery store present at all. To the North-west (above and left) the downtown census tract, the same applies.
Map 1. Grocery Store Affordability in Guelph
Thus, it is clear to see that the downtown area is a food mirage surrounded by food deserts or food mirages in almost every direction.
In Map 2, upon removing all of the mid-cost grocery stores (Metro and Zehrs) as well as all of the high-cost grocery stores (Angelino’s, Market Fresh, and Goodness Me), thus focusing solely on low-cost grocery stores, we can observe that even a conservative estimate would put at least two-thirds of city residents outside of a 1km walking distance to a low-cost grocery store. This map demonstrates the large expanse of the city that is a food mirage or food desert for low-income residents in the majority of the city.

Map 3 shows the prevalence (proportion) of residents living below the Low Income Cut Off (<LICO) in each census dissemination area across the city, thus giving us a more accurate idea as to which areas are more acutely impacted by food mirages and food deserts. This map incorporates color-coded LICO prevalence data by dissemination area from the 2016 Census Profile (Statistics Canada, 2017) to display the LICO prevalence in relationship to grocery store cost level, also color-coded here as in the previous maps. This map shows that the downtown and immediately surrounding areas hold a significantly higher and more concentrated prevalence of <LICO residents than most of the rest of the city. Also, the periphery of the city shows pockets of dissemination areas with a higher prevalence of <LICO residents, often where social housing is located.

Map 3 builds on the previous maps by incorporating color-coded data for the prevalence of <LICO residents by dissemination area, giving us a visualization of the areas where food insecurity exists and is likely to be exacerbated by grocery store
cost level and proximity. The LICO prevalence also serves as a proxy for the general income levels of neighborhoods in relationship to grocery store cost level and
proximity. Although there are some low-cost grocery stores aptly located in low-income neighborhoods in the Western part of the city, the entire central section of the city is home to only the most expensive grocery stores in the city, despite showing a higher prevalence of <LICO residents.

Map 3 shows that most of the dissemination areas with a higher prevalence of <LICO residents are currently located in either food mirages or food deserts. Take for example the food desert in the Northern most central section of the map (the top most center), which contains a cluster of three dissemination areas with over 11.6% <LICO residents (two of the three being >18.4% <LICO residents), yet no grocery stores within a 1km walk distance. Heading Eastward (right) from that area we find a cluster of several more dissemination areas of >18.4% <LICO prevalence outside of any of the 1km walk distance polygons to grocery stores. Looking more closely at the map we can find several other areas across the city that show this combination of (1) being a food desert (located outside of the 1km walk distance polygons) and (2) containing several neighboring dissemination areas with >11.4% <LICO residents, clustered together.

Map 3 also displays the precise location and 1km walk distance buffer for the proposed mid-cost grocery store in the North-east end of the city. Notably, the dissemination areas that show higher prevalence of <LICO residents in the Northern region of the city are located outside of the 1km walk distance buffer to the proposed store. Therefore, not only is the proposed store a mid-cost store, which is
certainly not good news for low-income shoppers, it is also over 1km away from the 
most of the <LICO residents in that region of the city.

Lastly, Map 4 (See Appendix 10.4) displays similar data to Map 3, but for the food 
environment for the municipality of Chatham, Ontario, which has surprisingly 
similar characteristics to the Guelph food environment map. Similar to Guelph, 
there is an underserved downtown area in Chatham with a high prevalence of <LICO 
residents. Most of the lower-income neighborhoods across Chatham are kilometers 
away from low-cost grocery stores, and thus experience similar food affordability 
and accessibility challenges to those faced by the <LICO residents in Guelph, thus 
showing that this is not an issue unique to Guelph.

5.3. Interviews and Surveys: Descriptive Statistics

Table 5 below shows a list of descriptive statistics regarding the basic demographic 
information for the study sample.

The sample was made up of six men and nine women (n = 15). The mean age for the 
group was 46.5 years of age. Just over half of the sample (53%) identified 
themselves as “white/Caucasian,” while the remaining participants listed a variety 
of ethnicities, with “African” making up the next largest ethnic group in the sample 
(20%).
Table 5. Descriptive Statistics for Demographic Information of the Interview and Survey Sample ($n = 15$).

<table>
<thead>
<tr>
<th>Gender</th>
<th>9 Female, 6 Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (mean)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>46.5</td>
</tr>
<tr>
<td></td>
<td>45.6 for Males</td>
</tr>
<tr>
<td></td>
<td>47.1 for Females</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
</tr>
<tr>
<td></td>
<td>53% White/Caucasian</td>
</tr>
<tr>
<td></td>
<td>20% African</td>
</tr>
<tr>
<td></td>
<td>7% First Nation</td>
</tr>
<tr>
<td></td>
<td>7% Ashkenazi Jewish</td>
</tr>
<tr>
<td></td>
<td>7% Slavic</td>
</tr>
<tr>
<td></td>
<td>7% Hispanic</td>
</tr>
<tr>
<td>Education (completed)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>13% Junior High School</td>
</tr>
<tr>
<td></td>
<td>40% High School</td>
</tr>
<tr>
<td></td>
<td>27% BA – University</td>
</tr>
<tr>
<td></td>
<td>20% Graduate - University</td>
</tr>
<tr>
<td>Work Status</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0% Full-Time Permanent</td>
</tr>
<tr>
<td></td>
<td>7% Full-Time (Temporary Contract)</td>
</tr>
<tr>
<td></td>
<td>33% Part-Time</td>
</tr>
<tr>
<td></td>
<td>13% Retired</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0% Married</td>
</tr>
<tr>
<td></td>
<td>53% Single</td>
</tr>
<tr>
<td></td>
<td>40% Divorced</td>
</tr>
<tr>
<td></td>
<td>7% Separated</td>
</tr>
<tr>
<td>Household Type</td>
<td></td>
</tr>
<tr>
<td></td>
<td>80% Living Single</td>
</tr>
<tr>
<td></td>
<td>20% Single Parent Families</td>
</tr>
<tr>
<td>Government Benefits</td>
<td></td>
</tr>
<tr>
<td></td>
<td>47% Ontario Works (Social Assistance)</td>
</tr>
<tr>
<td></td>
<td>20% ODSP (Ontario Disability Pension)</td>
</tr>
<tr>
<td></td>
<td>7% Old Age Pension</td>
</tr>
<tr>
<td>Income, Annual Household (mean)</td>
<td>$15,840.00</td>
</tr>
<tr>
<td></td>
<td>$14,700 for Males</td>
</tr>
<tr>
<td></td>
<td>$16,600 for Females</td>
</tr>
<tr>
<td>Living &lt;1km to Downtown</td>
<td>53%</td>
</tr>
</tbody>
</table>

Please note: All categories showing prevalence (%) do not necessarily add up to 100%, as some either (1) do not pertain to all of the participants, or (2) multiple answers applied to the same participants.

Every one of the 15 participants were either Single, Divorced, or Separated. Three of the participants (20%) were single mothers and there were no single fathers in the sample. Eleven of the 15 participants relied on government benefits for the majority of their income. Eighty-seven percent of the sample had at least a High
School education with 47% holding some type of university degree. Forty percent of the sample had some type of employment, yet none were in full-time permanent positions. The average annual income of the sample was $15,840.00, which is below the Low Income Cut Off, which was $17,240.00 annually in 2017 (Government of Canada, 2015).

Table 6 below displays the descriptive statistics – such as means and proportions – from the interview/survey regarding various experiences related to Food Insecurity.

The monthly food budget of the sample was $208.53, with males ($166.67) showing a significantly smaller monthly food budget than females ($236.44). Fresh fruit and vegetable intake (measuring in “times per day”) for the group was 1.9, while males (0.6) consumed them significantly less times per day than females (2.8). Processed fruit and vegetable intake (measuring in “times per day”) for the group was 1.2 and there were no gender differences in this case. All but one participant stated that fresh fruits and vegetables were lacking from their current diet. Roughly half of the sample stated that meat (53%) and fish (47%) were lacking from their diets current diets, while 27% stated that nuts were lacking from their diet.

The average distance traveled to grocery store of choice was 1.6km, while males (2.4km) traveled significantly further than females (1km) to buy groceries. While for the sample, participants traveled an average of 0.6km further than the nearest
**Table 6. Descriptive Statistics for Food Accessibility, Affordability, and Insecurity.**

| Monthly Food Budget (mean)                  | $208.53         |
|                                          | $166.67 for Males |
|                                          | $236.44 for Females |
| Fresh Fruit and Vegetable Intake, "times per day" (mean) | 1.9 |
|                                          | 0.6 for Males |
|                                          | 2.8 for Females |
| Processed Fruit and Vegetable Intake, "times per day" (mean) | 1.2 |
|                                          | 1.2 for Males |
|                                          | 1.2 for Females |
| Healthful Foods Lacking From Current Diet | 93% Fresh Fruits and Vegetables |
|                                          | 53% Meat |
|                                          | 47% Fish |
|                                          | 27% Nuts |
| Distance to Grocery Store of Choice (mean) | 1.6km |
|                                          | 2.4km for Males |
|                                          | 1km for Females |
| Distance Beyond Nearest Grocery Store     | 650m |
|                                          | 1.3km for Males |
|                                          | 200m for Females |
| Shopping Frequency, Once per... (mean)    | 11.4 days |
|                                          | 15.4 days for Males |
|                                          | 8.8 days for Females |
| Transportation for Food Shopping          | 40% Bus |
|                                          | 40% Walk |
|                                          | 20% Car |
| Knowledge of Store Affordability          | 93% Had near complete accurate knowledge when compared to the FAI |
| Living in a Food Mirage/Desert            | 53% Food Mirage |
|                                          | 33% Food Desert |
|                                          | 13% Affordable Food Access |
| Emergency Food Services Usage Regularly (bi-monthly) | 67% Food Bank |
|                                          | 7% Soup Kitchen |
| Food Security                             | 13% Food Secure |
|                                          | 20% Marginally Food Insecure |
|                                          | 67% Severely Food Insecure |
| Meal Skipping Monthly, Weekly, or Daily   | 13% Daily |
|                                          | 13% Weekly |
|                                          | 33% Monthly |
| Experience Ongoing Financial Stress       | 87% Financial Stressed |
| Biggest Barriers to Obtaining Healthy Food| 93% Cost |
|                                          | 53% Transportation |
| Groceries Are More Costly Downtown        | 93% responded yes |
|                                          | 7% responded no |
| Purchased More Food at Low-Cost Stores than High-Cost Stores | 73% yes |
|                                          | 13% no |
|                                          | 13% maybe |
| Would Buy More Fresh Fruits and Vegetables if Living Closer to a Low-Cost Store | 53% yes |
|                                          | 13% maybe/possibly |
|                                          | 33% no |

Please note: All categories showing prevalence (%) do not necessarily add up to 100%, as some either (1) do not pertain to all of the participants, or (2) multiple answers applied to the same participants.
grocery store to their neighborhood to go grocery shopping, that distance averaged 1.3km for males and 200m for females. The average food shopping frequency for the group was roughly once per 11 days, with males food shopping once per 15 days and females food shopping once per 9 days. Aside from car-drivers (20%), 40% of the sample exclusively walked to buy groceries while the remaining 40% regularly used public transportation. Regarding knowledge of the price differences across different grocery stores, 93% (all but one) gave an accurate ranking of the grocery stores from least to most expensive.

Fifty-three percent of the sample resided within a food mirage, while 33% resided within a food desert. Although the remaining 13% (2 participants) resided within one kilometer of a low-cost grocery store, both participants resided on the very edge of the 1km walk distance from a low-cost grocery store (>900m). Two-thirds of participants relied on food banks with regularity, while only one participant (7% of the sample) regularly attended a soup kitchen for meals. Two-thirds of the sample is “severely” food insecure, while 20% are marginally food insecure, with only two participants (both retirees) being food secure. Sixty percent of the sample said they skipped meals at least once per month, with some skipping meals weekly (13%) or daily (13%).

All but two participants stated that they experienced ongoing financial stress. The two participants who did not experience financial stress were the two retired participants. Both stated that they had experienced significant financial stress in
past times in their lives. All but one of the participants stated that the high cost of food was the greatest barrier to obtaining adequate healthy food. Over roughly half (53%) of the sample also stated that challenges related to transportation are also a barrier to obtaining adequate healthy food. Furthermore, 93% of the sample stated that groceries were significantly more expensive in downtown Guelph than outside of the downtown area. Roughly half of participants (53%) stated that they would consume more fresh fruits and vegetables if they lived within a 1km walking distance to a low-cost grocery store with an additional 2 participants stating “maybe” or “possibly.” Almost three-quarters of respondents stated that they buy more food when they shop at a low-cost grocery store compared to when they shop at a higher-cost grocery store.

Considering that the average monthly food budget for the participant sample was $208.53, an increase in grocery prices by even 30% can significantly reduce the purchasing power, or total quantity of food items that one can purchase, of a low-income resident. Since the most affordable NFB total came to $207.03 at FreshCo, it will be easy to demonstrate the approximate purchasing power across different stores, since that value is almost exactly equal to the $208.53 average monthly food budget of the interview sample.

Table 7 displays the proportion of the NFB food list that a monthly food budget of $208.53 can buy at each grocery store. That monthly budget can buy you 43% as much total food at Goodness Me as it could at FreshCo, which represents a 58%
Table 7. Relative Purchasing Power of Average Monthly Food Budget for Different Grocery Stores.

<table>
<thead>
<tr>
<th>Grocery Store</th>
<th>How much food from the NFB list will $208.53 buy you?</th>
</tr>
</thead>
<tbody>
<tr>
<td>FreshCo</td>
<td>101%</td>
</tr>
<tr>
<td>No Frills</td>
<td>94%</td>
</tr>
<tr>
<td>Food Basics</td>
<td>93%</td>
</tr>
<tr>
<td>Walmart</td>
<td>91%</td>
</tr>
<tr>
<td>Metro</td>
<td>78%</td>
</tr>
<tr>
<td>Zehrs</td>
<td>76%</td>
</tr>
<tr>
<td>Angelino's</td>
<td>58%</td>
</tr>
<tr>
<td>Market Fresh</td>
<td>55%</td>
</tr>
<tr>
<td>Goodness Me</td>
<td>43%</td>
</tr>
</tbody>
</table>

reduction in purchasing power between the two stores. That same monthly food budget amount can buy you 76-78% as much food at the mid-cost grocery stores (Zehrs and Metro) as it could at FreshCo, which represents a 23-25% reduction in purchasing power between the mid-cost stores and FreshCo. For low-income people who are very likely to be experiencing food insecurity to begin with (as data from the current study shows), a 23-58% reduction in purchasing power for food appears to be an astronomical deficit.

Additionally, the following observations can be made from the sample:

1) The four participants living closest to their grocery store of choice both (1) did not rely on food banks or soup kitchens and (2) shopped at more expensive grocery stores despite their low income and financial stress. Considering that 33% (5 of 15 participants) did not rely on food banks or
soup kitchens, it appears that most of them shopped closer to home despite the increase in food costs.

2) Four of the five participants living closest to their grocery store of choice did not use public transportation for food shopping, but walked or biked.

3) It appears that Distance Traveled to Grocery Store of Choice and Food Shopping Frequency are negatively correlated across the sample, thereby suggesting that the further one travels for food shopping, the less shopping trips ones makes over time.

4) It appears that Distance Traveled to Grocery Store of Choice and Monthly Food Budget are negatively correlated, thereby suggesting that the further one travels for food shopping, the lesser amount of money that one spends on food over time. Therefore, this lack of money for food could perhaps be an influencing factor on distance traveled for food shopping, in order to shop at lower-cost grocery stores.

5) It appears that Distance Traveled to Grocery Store of Choice and Fresh Fruit and Vegetable Intake are negatively correlated, thereby suggesting that the further one travels for food shopping, the less fresh fruits and vegetables they consume daily.

6) It appears that Distance Traveled to Grocery Store of Choice and Processed Fruit and Vegetable Intake are negatively correlated, thereby suggesting that the further one travels for food shopping, the less processed fruits and vegetables they consume daily.
7) The two participants who traveled the furthest (>3km) from their neighborhood for food shopping had both experienced racial discrimination at grocery stores. These two participants also food shopped the least frequently and had the lowest monthly food budgets of the sample.

8) Four of the five participants who traveled the furthest (>2.2km) from their neighborhood for food shopping were the only four participants who shopped at a grocery store other than the closest available grocery store option. All four lived within 600m of a high-cost grocery store and traveled over 2.2km to food shop at a low-cost store.

9) No one who lived closer to a low-cost grocery store than a high-cost grocery store did their food shopping at a high-cost grocery store.

10) All three of the single mothers in the sample stated that they had either skipped meals (in two cases) or undernourished (in one case) in order to provide more/better food for their children.

11) Two pet-owners in the sample stated that they skip meals in order to feed their pets.

5.4. Interview: Qualitative Analysis

5.4.1. Local Food Affordability: Cost

Food cost was named as the most significant barrier to obtaining adequate healthy food, and was perhaps the most mentioned theme throughout the interviews. All but one of the interviewees stated unequivocally that the price of grocery foods in
downtown Guelph was more expensive than in any other area of the city. Interestingly, the same majority of interviewees also stated that mid-cost grocery stores outside of the downtown area were often times prohibitively expensive as well.

When speaking of grocery foods available in the downtown area, one middle-aged woman stated that she “simply can’t go in,” which echoed the sentiments of other younger participants who said they can’t afford to shop downtown (“never shop there”). When asked about the price of food downtown, responses from different participants ranged from “frustrating” to “crazy!” to “ridiculous” to downright “horrific.” “If you make minimum wage, there’s no way you can afford to shop downtown,” stated one mother of three children who had just left a minimum wage job due to the combination of physical injury and psychological stress. One downtown resident stated that the prices of grocery foods downtown were “two to three times as expensive as Food Basics,” which the Food Affordability Index confirms to be true (especially for fruit fruit and vegetables).

When they did find themselves shopping at a grocery store downtown, participants generally only bought a handful of food items rather than performing a full-sized shop, which they would often reserve for low-cost grocery stores. “A ten ingredient soup turns into a four ingredient soup when I shop downtown,” stated a young woman living in the downtown area. Participants stated that they “quickly popped in and out” of downtown food stores to purchase “one or two things.” A common
strategy was to be carefully selective when shopping at high-cost stores, whether it was located downtown or elsewhere.

Still, some low-income residents do the bulk of their food shopping downtown. Four downtown residents cited their enthusiasm for “local” and “organic” foods as the reason for shopping downtown despite the high cost. For them, paying the premium for local and organic foods were perceived to be worth it, even on a tight budget. One of these four low-income downtown shoppers stated that she shopped there in order to “accommodate what is possible,” stating that paying bus fare was impractical on her limited food budget, considering that she spends less than $10.00 per shopping trip. “There’s an interaction between food price and store location,” which she factors in to her decision of where to food shop. This same person along with two of the other three who shop at the high-cost downtown stores, stated that they buy significantly more food when the opportunity arises to shop at a low-cost grocery store. Their issue is that that opportunity arises inconsistently for them.

One young participant who doesn’t shop for groceries downtown due to the high cost, suggested “they should have built a Food Basics downtown instead of the new Goodness Me!” (Goodness Me is an organic food supermarket that recently opened up for business in downtown Guelph). An older participant recalled that there in fact used to be a Foodland (a low- to mid-cost grocery store) located at the same traffic intersection as the new Goodness Me, although it closed down for business some time in the mid-1990s. “It’s the gentrification of downtown Guelph,” stated a
young downtown Guelph resident, suggesting that if anything else there will only be more high-cost boutique stores opening up to accompany the onslaught of new high-priced high-rise condominiums being constructed around the outskirts of the downtown area.

“The price of food downtown is high versus high everywhere,” stated a retired participant who lives downtown but shops by the flyer every week, driving around the city to whichever grocery store has the best deals. Many participants felt the same way about mid-cost grocery stores (such as Metro or Zehrs) that they do about boutique health food stores downtown: that they are all highly expensive. About three-quarters of the participants said that they purchased more food, and specifically more fresh food, when they shopped at a low-cost grocery store compared to a mid- or high-cost store.

The lone participant of the sample who stated that downtown food prices were “reasonable” also stated, “food is too expensive everywhere!” That same sentiment was common to the great majority of low-income residents: even the low-cost grocery stores are only low-cost in comparison to other stores. When living with a limited food budget and often relying on emergency food services to supplement one’s diet, all food is expensive.

“Salmon is a privilege,” stated a single mother who often finds her self in the position of choosing between properly nourishing either herself or her children on a
daily basis. Fish, as well as fresh fruits and vegetables and fresh meats, were items that participants commonly felt were lacking from their diet due to the high cost of these healthy foods.

5.4.2. Perceived Barriers to Eating a Healthier Diet: Transportation

While fourteen of fifteen participants stated that cost was the greatest barrier to obtaining an adequate amount of healthy food, roughly half of participants (47%) stated that transportation challenges were also a barrier to obtaining an adequate amount of healthy food to eat.

*Car-Drivers*

One participant listed the price of gas as a limiting factor for her grocery store choices and shopping frequency. Despite being only one of three participants with regular access to a car (she borrowed her landlord’s car for food shopping), the total cost of gas and food deterred her from venturing off far from her neighborhood. Even though she lived in the middle of a food desert, about 1.7km walking distance from any grocery store, she was fortunate that the two stores in closest proximity to her apartment were both low-cost stores. Of the two other participants with regular access to cars, one stated that the cost of gas is high enough to limit her from driving “across town to access the North End Harvest Market,” which is a free food market and essentially a small-scale fresh food bank, available one evening per week. Due
to the high price of gas, she often walked the almost 1km distance from her home to buy groceries at a low-cost store, with her children. The last of the three participants with access to cars is a retired woman, who along with the only other retired participant, does not experience financial stress at this stage of her life. One other participant did in fact own a car, but had not been able to afford repairs for the car and it had not been operational for a significant amount of time.

Two of the three drivers stated that they regularly read flyers and drive to whichever grocery store has the best sales for the specific items they need. Having the freedom of car transportation certainly increases their access to low-cost foods as well as providing greater ease of food transport that many other low-income shoppers lack.

Walking

Of the six participants who lived closest (<1km walking distance) to their grocery store of choice, all walked to go food shopping most of the time, with the occasional drive in one case or the occasional taxi-ride home in a couple of other cases. All six participants, despite their closer relative proximity to the grocery store where they shopped, stated that transportation issues were a significant barrier to obtaining an adequate amount of healthy food. The reality they describe is simple: food is heavy, bulky, and generally not easy to transport, especially when one factors in local weather conditions.
Interestingly, not only did the six living closest to their grocery store of choice walk for food shopping, so did five of the seven living furthest from their grocery store of choice. One significant difference in most cases of those living further away is that they do mostly take the bus during the winter time. The three who travel the furthest distance to buy groceries all walk during the summer and bus during the winter. Some continue to walk distances over 1.6km throughout the winter.

Although most walkers speak positively about walking to the grocery store, it is the trip home, carrying food, which presents the greatest challenge. This is why some take the occasional taxi home, phone up a family member with a car, or take the bus even if it is not efficient time-wise or cost-wise.

In one specific case, a middle-aged man walks about 3.4km to food shop, shops for about a half hour, and then walks 3.4km back home carrying his groceries. In his specific case, he describes how by the end of his trip his feet are burning with pain. The pain in his feet requires him to take a full day or more of rest following each food shopping excursion, which in his case occurs roughly once a month. This man takes the bus to grocery shop during the winter months, allowing his feet some reprieve.

Still, other walkers describe how walking to buy groceries “feels great” and is “a good form or exercise.” One diabetic middle age man who walked over 3km to food
shop says that he looks forward to each long walk as a journey in its own right.

“Walking the streets, life is never boring,” said one walker in the group.

Another walker who walks about 1km to the grocery store where he prefers to shop, complains of wearing out shoes quickly from all of his walking. He also has terrible pain in his feet that has developed over time, stating that it is the result of his walking in poor quality worn out footwear. When I interviewed him he had just purchased a new pair of hiking boots at a discount store for $20.00. He commented about how the tension in his mind over whether to buy new shoes or food had persisted for months, walking with a hole in the bottom of his previous boots all throughout that time period.

Bussing

Two participants in the sample were consistent year-round public transit users. One was retired and had no complaints about the bus system. He traveled 30 minutes each way to and from the grocery store that was a little over 1km from his neighborhood. He was unbothered thinking about how when he was younger he could have easily walked that distance in half the travel time of the bus.

The other year-round busser complained of the hassle of carrying heavier bulkier items such as laundry detergent, toilet paper, and soda pop on the bus. Living less than 600m from the newly built Goodness Me organic supermarket, he went in to
the store one time and knew immediately that it was too expensive for his budget. As a result he travels just about 3km each way by bus to food shop at a low-cost grocery store in another part of town.

In three similar cases, walking and bussing took an equal amount of time to arrive at the grocery store, since the bus stops were actually out of the way. Bussing, of course, holds an addition monetary cost, so if it doesn’t save time then it is not necessarily a worthwhile investment. In these cases, the participants still walked the majority of the time to save money. In two of the three cases, they basically never took the bus because it went far enough out of the way as to be considered a “nuisance.”

Two other participants stated that they occasionally combine shopping trips with other bus-trips for practical purposes such as work or appointments. In these instances there was no need to rationalize spending money for a bus ticket since that money was already being spent to accommodate the other activity.

5.4.3. **Experiences With Emergency Food Services**

Emergency food services include food banks, soup kitchens, food voucher programs, as well as a few smaller scale free food markets that are the result of government funded community programs or church funded food security initiatives. Two-thirds of the participants had used a food bank within the past three months, with most
accessing food banks on a monthly basis. Participants generally found that the food they received from the food bank – whether it be from the actual Food Bank, the Salvation Army, the Hope House, or another program – at least provided them with some meals and lasted them between about one to two weeks.

A common criticism of food bank food was that it was near stale or very close to the expiration date, cans were dented, and the scant fresh fruits and vegetables offered were often close to turning rotten. The bread was stale. “The [food bank] food needs to be eaten quickly and is often wasted,” stated one women who luckily was able to receive a small amount of fresh vegetables from her church group once per week, although the quality wasn’t consistently good enough to last more than a day or two if even that amount of time. In fact, three participants stated that they avoided food banks due to the low quality of the food, despite their own food insecurity.

One middle aged man with diabetes remarked that the food bank food was “filled with carbohydrates” and was not appropriate for him to be eating considering his illness. This man skipped meals every week, not because he had bare cupboards, but because he lacked appropriate food. Often times, he would make a tea or light soup as a meal replacement when appropriate food was not present. Still he felt negatively impacted when his preferred food bank limited their food bank services from once a month to once per two month period. He was not the only one to
emphasize how emergency food services are being cut back at various organizations around the city.

A mother of three who relied on food banks and was critical of the quality of food bank food, found that she herself was eating the food bank food to allow her children to eat fresher more nutritious foods. Essentially, she had undernourished herself to help properly nourish her children. When I asked her if she ever skipped meals in order to feed her children, she replied no, although she added that some of the meals she eats are “worse than skipping meals due to the toxicity in the food,” referring to the overly processed foods from the food bank.

Still, not everyone was displeased with the food bank. One younger woman said that she feeds herself for two weeks each month from food bank food, including fresh fruits and vegetables that she receives. One retired women stated that “it’s too much food!” and noted that the fresh vegetables in the summer are much better quality than in the winter. Generally speaking, emergency food service users were much happier with food voucher programs, which allowed them to select their own choice of items at a pre-selected grocery store. Unfortunately, due to the higher cost of the food voucher programs, the local church who administers them is only able to offer each client a maximum of three per year. Most food voucher beneficiaries use up their allotment of food vouchers by the spring-time each year. But overall, for every positive experience with the food bank, there were four critical experiences.
A middle aged person of color, who had been volunteering with a food program in a local organization had not only experienced significant racial discrimination from the client-base, but had experienced what he felt was white fragility and homophobia from his supervisors. Clients would often call him the N-word or other racial slurs and tell him to “go back where you came from!” A key event occurred when he suggested to management that they set up some type of guidelines for staff security, even showing his management copies of a staff security policy from another non-profit organization that he had taken the time to print out from the internet, and the management reacted defensively showing significant defensiveness and fragility. In the end, his suggestions were not heeded by the organization. He had been volunteering significant hours on a daily basis, and felt like he “was doing paid work for free” while the paid administrator “Skypes with her daughter.” His time as a volunteer ended when he incurred an injury accidentally while volunteering, for which he did not receive any coverage under the organization’s insurance policy, due to what appears to be avoidance. His story is striking and illustrates some of the pitfalls of disorganized social programs, and the ideological conflicts that can arise within organizations that have explicit ideologies that infringe upon the rights of different social groups/identities (for example, the negative discrimination of some churches regarding homosexuality or far-right conservatives regarding immigrants, or even both together).

Numerous interviewees of different ages stated that they did not attend soup kitchens in the city due to the drugs and violence that they had witnessed and knew
to persist at local meal services. Many described the clients of the soup kitchens as drug addicts and younger-aged drug dealers who were often times rude, argumentative or belligerent. Participants said that the police were often present at soup kitchens. One Black interviewee stated that he had been bullied at a meal service and called racial slurs, so he did not return despite feeling that the access to free food would greatly benefit his health. Of the five interviewees who spoke of attending meal services, only one continues to do so presently. Due to his diabetic condition, he says that there is not a whole lot for him to actually eat there but he can make himself a tea and find his way around without much discomfort.

5.4.4. Skipping Meals

Nine out of the fifteen interviewees said that they have skipped meals on a monthly (5), weekly (2), or daily (2) basis. As mentioned above, one other interviewee, a mother of three, “undernourishes” herself with food bank food in order to better feed her children. Thus, ten of the fifteen participants are severely food insecure. Two more of the fifteen interviewees do not skip meals although they describe their diets as “boring” and “lacking of variety” for periods of time, and therefore can be considered marginally food insecure. Considering that there are two retirees (even low-income retirees have very low rates of food insecurity in Canada due to the government pensions available) in the group of fifteen that leaves only one interviewee who does not feel the strain of either skipping meals, undernourishment, or feeling their diet is seriously lacking of variety. The one
standout has the highest income of the group, is the only full-time worker, and spends all of her expendable income on food, forgoing the possibility of saving money in order to eat well. By definition, she is also marginally food insecure, due to her constant worrying and stress about being able to afford adequate food.

Each person’s experiences with skipping meals are entirely unique. One middle aged man skips meals “when the bills are due” in order to make his bill payments, roughly once a month. “There’s only so many soups you can make,” he stated, explaining that soups were the most cost effective way to eat. “I don't even like soups anyway,” he lamented. Aside from those times, he stated, “I get everything I need from the food I eat.”

A younger women fasts when she has long days commuting out of town to college, where she cannot afford to purchase multiple meals per day to feed herself properly, and has resorted to rationing whatever food she does get to last over the course of a day. “I'm like a hunter-gatherer,” she offered as a metaphor to describe her rationing strategy. Her case is also interesting because although her college offers emergency bursaries to low-income students in financial need, she struggles to write the page-long essays describing her financial situation that the bursary applications require, and has missed opportunities as a result. She is frustrated by the administrator’s lack of understanding for her situation.
A younger adult man still living at home with his mother and siblings skips meals about twice per month when his family's government incomes have run out. At those times, he struggles emotionally when thinking about his younger sister going to high school without a proper lunch. He also worries about his mother who suffers from a major chronic illness. He himself suffers from depression.

One woman living with a permanent disability that prevents her from working, who is otherwise a fresh food enthusiast, skips meals on an occasional basis in order to adequately feed her two teenage boys who play sports. Another single mother skips meals occasionally when she runs out of money at the end of each month.

One young women skips breakfast every day in an attempt to stretch out what food she has. She feels that as long as she is not working at her part-time job on a particular day, skipping breakfast is no major sacrifice. Nonetheless, she skips additional meals every three or four days on top of that. She also stated that she will skip meals in order to feed her dog in the worst of times.

One man who in a previous phase of his life had been accustomed to spiritually fasting one day per week, returned anew to fasting one day per week, although for financial reasons instead of spiritual ones.

As mentioned above, one man skipped a couple of meals per week due to lacking appropriate foods to consume considering his diabetic condition.
Lastly, one young man says he only eats one meal per day and hasn’t eaten a fresh fruit or vegetable in well over a year. Not many years past, he held a job and owned a car, but came upon hard times following the death of a close family member. He has been unable to work since the death and is in receipt of Ontario Works and lives in non-profit housing. He relies on food banks and shops for discounted food items at the low-cost grocery store near his home. He takes care of his deceased family member’s dog and stated that “the dog eats before I do.” In one year’s time, he went from a body weight of over 300 pounds to now being below 180 pounds, not from intentionally dieting of course, but as a result of a lack of food and food insecurity. “I did want to lose the extra weight, but I never wanted to lose it like this,” he stated in regards to his rapid weight loss. “If I had money, I’d be eating like a king,” he responded when asked how his diet would change if he had a higher income.

5.4.5. Experiences With Social Programs

Just over two-thirds of the interviewees relied on government social assistance programs (Ontario Works) and the Ontario Disability Pension (ODSP). Three of the ten interviewees relying on government assistance also worked at a part-time job, which would supplement their incomes to a limited degree, due to the policy which allows the government to reduce their government assistance moneys by $0.50 per every dollar that is earned. The 2018 monthly rate for a single adult OW recipient is $721.00 and for a single adult on ODSP is $1128.00. The cost of renting a room in a
shared house in Guelph is generally over $500.00/month, and for a private one bedroom apartment is an average of $898.00/month plus utilities (CMHC, 2015). That 2015 rental estimate is subject to a roughly 2.7% rise per year according to the Government of Canada’s CMHC, thus giving us a roughly $972.72 (plus utilities) average monthly rent in Guelph in 2018.

“It’s not enough to live off of,” stated a young man, living in non-profit housing, experiencing extreme food insecurity, as exemplified by his extreme weight loss over the time period he has been in receipt of OW. Ten of the eleven interviewees receiving government assistance, whether it was OW or ODSP, relied on a food bank at least once every couple of months if not more frequently. The two ODSP recipients, although receiving a few hundred dollars more per month more than OW, both relied on food banks and skipped meals. Most of their money went to paying their rent and bills, which certainly was the same case for OW recipients. One young interviewee who was prescribed SSRIs for depression, criticized OW for not offering a special diet allowance for mental illnesses (OW does offer a special diet allowance for specific physical illnesses or dietary specifications).

One OW recipient described the efficacy of the German welfare system, which not only granted much higher monthly benefits, but offered jobs to unemployed persons keeping them employed and motivated. “Why don’t we have a system like the Germans do?” he asked, after expressing his feelings of personal failure for not being able to maintain current employment, despite a long productive work history and a
university degree in the sciences. Another interviewee, who was not in receipt of social assistance, suggested that an even better idea than increasing OW benefits would be to lower the price of foods.

Four women interviewees all independently brought up their experiences at Women’s Shelters, unprompted. The common characteristic of these experiences was that the Shelters only offered one meal per day, which put the women in the precarious position of needing to acquire food to feed their young children, often times in a new city while experiencing a high degree of stress and turmoil. Since some of the women stayed in the Shelters longer than one month, over time, the inadequate amount of food became a real cause of stress for each of these women and their children. One woman describes staying in a Shelter for six months and walking over 2km from the Shelter with her three children to the nearest affordable grocery store, every week-end in order to buy food for the week. Although each of these women found support from the staff and women at the Women’s Shelters, the clear consensus was that the amount of food was inadequate.

5.4.6. The Social Ecology of Grocery Stores

When asked if they noticed any differences in the social and cultural atmosphere of different grocery stores, twelve of fifteen interviewees said that they did. Nine of the twelve stated that they noticed more “low-income people” or “immigrants” shopping at the low-cost grocery stores, while “working people,” “white middle-
“class,” “students” and “upper-class” people shopped downtown and at mid-cost grocery stores. Some interviewees stated that “families” shop at low-cost stores while others stated that they shop at mid-cost stores.

“Old successful hippies shop at Goodness Me,” said one downtown resident and reluctant downtown shopper. She described that shopping at the boutique and health food stores downtown was “about status.” She also described the physical environment of the downtown stores as appearing cleaner and having more elaborate food displays in comparison to the “trough-style fridges” and “empty barren” atmosphere at some of the low-cost grocery stores in town. Two interviewees stated that they felt discomfort at high-end grocery stores, while one complained of the “poor hygiene” of low-cost grocery stores where she said the customers tend to pick over the food more that at higher cost stores.

“The non-pretentious people shop at Food Basics,” said an Eastern European first generation immigrant man who had a masters degree and had worked professionally for decades before coming upon difficult times financially speaking. He preferred shopping at Food Basics because of its larger selection of imported “international” foods as well as its larger international clientele. Previously, he had experienced xenophobic discrimination from staff at a high-cost grocery store in town, and feels more comfortable shopping at Food Basics even though it is over 3.2km from his dwelling downtown, despite living within a few hundred meters from the grocery stores downtown.
Another interviewee had also experienced discrimination on several occasions from the staff of a grocery store in town when he attempted to use food vouchers. The staff at the grocery store repeatedly requested him to remove his hat to verify his identification, which is certainly not the norm. “After my purchase the cashier would throw my receipt down on the conveyor instead of handing it to me as they would a normal patron,” stated the interviewee, concluding “it’s because I’m Brown.” He felt like they treated him like a “thief who had stolen something.” Despite skipping meals on a weekly basis due to lack of available food, this interviewee had waited months before using a $75.00 food voucher just to avoid the racial discrimination. “I would rather starve than put up with their attitude,” he stated, adding that the grocery store “should have more understanding considering their diverse customers.” He said that he would wait until the holiday season to use the food voucher because store staff were generally more friendly at that time of year. This interviewee also traveled over 3.4km to buy groceries despite living within a few hundred meters of the grocery stores downtown. The interesting distinction of the story of this interviewee and the last one directly above is that they both travel the furthest distance to buy groceries of the sample and they both had impactful experiences with discrimination at grocery stores.

An Indigenous interviewee reminisced positively about living in a small town in Northern Ontario, where the local grocery store manager knew everyone by name
and took the time to help patrons out to find what they needed. She missed the “attentiveness” and “warmth” of that previous food shopping experience.

One interviewee who lived in a lower-income neighborhood and walked to buy groceries complained about being followed around the grocery store by undercover security guards. Living in an area known for drug addicts and crime (as much as is possible in Guelph), he complained about regularly being stopped by police in his neighborhood on a near-monthly basis. He said that he doesn’t get stopped by the police outside of his own neighborhood.

5.4.7. Food Quality

When asked if they noticed any differences in the quality of food between the different grocery stores in Guelph, six of the fifteen interviewees said no, with the remaining nine finding some differences in food quality.

The quality of food is “hugely different” between the health food stores and the low-cost grocery stores said one organic-food enthusiast, adding that “there is no comparison when it comes to quality.” Three of the four living downtown who also shop downtown all said unequivocally that the quality of food downtown is much higher, describing the produce as fresher, crisper, and tastier. The fourth downtown resident and shopper stated that “Market Fresh has really good quality food,” but when asked to compare it to No Frills, she said that they were “about the same
quality.” One downtown shopper complained about the increasing amount of produce and fish imported from China that she found at the low-cost grocery stores in town. She preferred to purchase the locally produced foods, even though they came with a significantly higher price-tag.

One life-long fresh food enthusiast described the quality of the fresh produce to follow the same gradient as the cost of grocery stores. In her experience, the low-cost stores had lower quality produce, the mid-cost stores had slight better produce, while the best quality produce came from the health food stores downtown. In fact, the three interviewees of the sample who consumed the most fresh fruits and vegetables per day, all made similar claims about the quality gradient for fresh produce around the city. Another fresh food enthusiast stated that the downtown stores had “better quality” food, while adding that “if you have money, you eat high-class quality foods.”

Two shoppers singled out Walmart as having particularly poor quality meats, with one stating the same about No Frills’ meat. Three interviewees stated that Food Basics had better quality meat and fish, although one added that the fresh produce at Food Basics was of “markedly different” quality from that sold downtown, and that it “looked neglected.” Several singled out two mid-cost grocery stores, Zehrs and Metro, for having a wide selection of fresh fish and a wider variety of fresh meats, while also noting the increased cost. “Food Basics has a lot of fish too, but it
is frozen,” stated one Food Basics shopper who occasionally shops at Metro for fresh fish.

“If it’s food, I'll eat it,” stated one interviewee experiencing extreme food insecurity. Another of the severely food insecure interviewees added that “it looks different, but tastes the same,” describing that most of the perceived difference in food quality between grocery stores was attributable to the difference in food packaging. Three other interviewees made similar claims about differences in food packaging contributing to perceived differences in food quality. They associated more elaborate food packaging with higher food prices, while stating that the actual food underneath the packaging was of the same quality.

5.4.8. Strategies for Obtaining Healthy Foods

During the interviews, I used the term “strategies” without elaboration, allowing the interviewee to respond in whatever way they thought was appropriate, while being sure to not settle for quick and simple responses. One common strategy for obtaining healthy foods employed by one-third of the interviewees, was “food banks,” which wasn’t surprising considering that two-thirds of the sample relies on them. Still, a few interviewees had also stated that food bank foods generally didn’t provide the healthiest foods, which is a possible explanation why only half of those in receipt of food bank foods listed them as a strategy for obtaining more “healthy” foods. Food vouchers were another form of emergency food service that some used
to obtain more healthy foods and were generally preferred over food banks due to
the freedom of food choice and the opportunity of purchasing fresh produce and
meats that vouchers entail.

Another common strategy for obtaining healthy food was to check flyers online,
which one-third of interviewees did with regularity. One single mother described
her use of the “Flip App,” which was a smartphone app that aggregated all of the
flyer information by geographic location and relayed price information regarding
the best sales and discounts for searchable items. She had access to a car, which
only twenty percent of interviewees had access to, so in her specific case the Flip
App proved to be a worthwhile tool. A retired car-owner looked up all of the flyers
when they were published mid-week, and had a similar strategy of driving to
whichever grocery store had the best deals on for the items she wanted to purchase.

Nine of the fifteen interviewees stated that shopping for reduced priced produce
and other reduced priced items helped them to acquire more healthy foods, and
more specifically more fresh produce. However, these reduced items also come
with a quick expiration date. One woman who does most of her shopping at the
Farmer’s Market downtown – with mid- to high-cost food prices – buys discounted
“seconds” from different local produce vendors whom she has developed a rapport
with over the years. This allows her to eat fresh local and organic foods, despite her
low food budget. One man who almost exclusively buys reduced priced produce
stated that he will often “rescue” food from the being wasted at a local soup kitchen.
He described recently taking a 5kg bag of apples from the garbage there, bringing them home, chopping them up, and drying the apples on a string in his apartment. Growing up in Eastern Europe, he said that food was never wasted, because they always had some creative way to preserve foods, or at the very least, food waste would be fed to pigs, chickens, or other animals close by.

The same man lamented that he did not have access to a garden in Canada, whereas back in his country of origin, gardening was the norm. Five interviewees stated that they have some form of garden during the summer time, be it a plot at a community garden or a patio garden of various potted tomatoes, peppers, herbs, and other green vegetables. Six others expressed a desire to grow food, but said they lacked either the money, space, or free time to garden. One local food enthusiast described foraging for berries, herbs, and wild greens along the rivers that run through the city, as a strategy that she uses to obtain more healthy foods in the summer time.

Budgeting is another strategy employed by four of the participants. Three of the four participants received formal types of budget counseling at Family Counseling, Ontario Works, and a local health club, stating that it helps them to save money. One man had established various alternative credit arrangements with family members as well as with a local pawn shop, where he would pawn his tablet for $40.00 cash intermittently, each time being granted 30 days to pay $50.00 back in order to re-acquire his tablet. He stated that he certainly is not the only one regularly pawning possessions for credit in this way.
The one interviewee with the highest level of income and the only interviewee with a full-time job – albeit a temporary full-time contract - stated that she spends all of her available money on quality fresh food, eating a considerably amount of fresh organic produce and local meat and fish. “I prioritize eating healthy food over owning a vehicle, eating out at restaurants, and having a cellphone,” she stated, adding that “if I don’t eat well I suffer.” While in between work contracts, she often finds herself going in to debt in order to maintain her quality of diet. She says that she experiences a significant amount of stress and anxiety over the price of food. “I don’t have children, gadgets, or subscriptions, and I don’t drink or smoke,” she says, although “I really do have the basics covered: more would be extra.” She says that she is very happy with her healthy way of eating, but is not happy with the toll the financial stress takes on her.

At length she described a previous phase of her life in which she was in receipt of Ontario Works for 3 years and living in non-profit housing, although even during that time, with much less income than she presently has, she says that she was still able to maintain an adequately healthy diet by her standards. She said that since most people avoided the gluten-free and organic food options at the food bank at that time, she was able to load up on healthy whole grain foods at the food bank. She also said that she cut back on the amount of organic produce she was eating and substituted it with roughly the same quantity of conventionally grown produce. Similar to her current situation, she simply cut back all other expenses dramatically
in order to prioritize healthy eating. She further explained that living in non-profit housing enabled her to afford a healthy diet at that time, although she subsequently emphasized the sub-standard living conditions and black mold, which she labeled a “public health disaster.” She described the “low self-esteem” common amongst those living in the non-profit housing where she lived, which she partly ascribed to the sub-standard quality of the housing.

Nowadays, due to the high levels of stress and anxiety she experiences around food affordability and food shopping, she says that she often asks herself: “should I be eating like this on my income?”

### 5.4.9. Financial Stress and Mental and Physical Health

All of the participants, with the exception of the two retired persons, said that they experienced ongoing and significant financial stress in their present lives, which mostly centered around food and health. Interviewees described their financial stresses as persistent, frequent, and intrusive. “Unintentionally, I will get angry when I’m stressed out about the price of food,” stated one man who noted that the price of food is constantly “jumping” higher. A middle-aged lady says that she cries when she sees that the prices have gone up on the foods that she buys. “It really would just be nice to shop stress-free and guilt-free,” she added, stating emphatically “food is a Right!”
Several interviewees stated that they catch themselves wandering around the grocery store indecisively about what to buy. One woman said that occasionally she will fill up a basket with food only to leave it on the ground before exiting the store without having purchased anything. She added that she takes comfort in walking around the grocery store, and that it can often lower her stress levels. A middle-aged man stated the opposite, that food shopping puts him in an irritable mood and that he can be surprised at his own rudeness and snappiness in the grocery store setting.

One young man who was prescribed SSRIs for depression believed that if he was able to eat a “normal” healthy diet that he would no longer need to take the pharmaceutical drugs he was prescribed. He described the levels of poverty and stress on native reservations in Canada, as well as amongst his social circle in Guelph and said, “we shouldn’t be living in poverty here.” One middle-aged man, said that the high prices of food had led him towards having negative thoughts and suicidal thoughts. He was not the only one to describe having difficulties with loneliness. “Who wants to be with someone who is suffering from multiple conditions?” he sighed.

Eight of the fifteen participants felt that they had a physical health condition resulting from their poor diet. For three it was obesity, while for three others it was either diabetes or being diagnosed as pre-diabetic. Another woman suffered from gastrointestinal inflammation, linking this condition directly to the lack of variety in
her diet. For one man, it was extreme and unintentional weight loss resulting from extreme food insecurity in his case. His extreme weight loss was accompanied by fatigue and very low day-to-day energy levels.

Three single parents specified that their financial stress was constant. One felt like she was perpetually planning and coming up short, to the point of exhaustion. “I’m chasing my own tail,” she stated, describing that her plight had been even worse when she had been working a full-time job at Tim Horto’s, due to the physical stress and time stress that the job added to her life with four children. She does not regret leaving that job, considering all of the extra grief it brought her, for relatively little more income than she receives on Ontario Works. She had previously been married to the father of her children, living a “middle-class lifestyle,” owning a home and a car, but that life was no more and she and her four children spent many months at a Shelter before finding a home. She describes worrying if she has enough money on her debit card when she makes a purchase, although her greatest stress is what she termed “parenting moments,” when she is unable to extend the same resources to each child, or when she hears her son’s self-conscious remarks about how skinny he is in comparison to his peers.

“I’m just angry,” stated one woman, “if it doesn’t change I cannot survive in this economy.” She describes living in fear of what will happen when her contract work ends. “Thinking about money, work, and food everyday, I can’t be carefree,” she explains.
Two middle age women describe the stress of repeatedly turning down working friends’ offers to go out to restaurants for meals, and the social isolation that entails. “If I had more money, I would be social more,” one woman said, adding that she gets tired of declining her friends offers. One describes her excitement for dating opportunities where the invitation includes a free dinner, for otherwise she would not be able to afford to eat at restaurants.

One young woman describes being in “constant” financial stress. When she was a little younger and more uninhibited she would shoplift fresh produce out of necessity, and she was not alone in stating this. She works part-time and is a student and sees herself as having a bright future eventually. “I have to put food ahead today, but tomorrow I will have to eat carbs in order to pay a bill,” she says, explaining a constant cycle of craving nutritious meals but not being able to afford to eat them every day. “I can’t afford to exercise even though I would love to have that physical emotional release,” she states, explaining that exercising requires one to have additional appropriate foods to provide the energy that exercise necessitates.

One man described how financial stress permeated literally every action he took over the course of a day, from meal size and quality, to meal preparation (“cooking everything fast” to reduce his electricity bill), quick showers, walking everywhere until his feet were sore, social isolation and stigma, self-judgment and anger,
suffering from pre-diabetes and depression, and more. He has been living this way for years and he is not the only one in the sample who has done so.

“Food connects to everything,” said one single mother of four children, drawing a connection between her own poor diet to her worsening health and growing sense of aloneness and depression. Working a full-time minimum wage job “with no chance for advancement” over the past year had only contributed time-stress and physical injury, so she quit the job. She was certain that another minimum wage job would do nothing to reduce her stress levels, to improve her physical health, or help her to be a better parent.

“We’re creating an underclass,” stated one middle aged woman who lived all of her life at a <LICO income-level, in and out of shelters and social housing, experiencing the full gamut of food insecurity before figuring out ways of obtaining adequate healthy foods, mostly coming at the expense of all else. Reminiscing on not distant times in her life, she stated “I didn’t do anything else but eat.” She recalled how moldy the social housing units were and how dreary the mood was in her neighborhood. “We say we care then we just buy a new iPhone,” stated one younger woman experiencing severe food insecurity. The sentiment of powerlessness and social isolation is palpable for many of the participants. Even those who had university degrees weren’t any more hopeful.
6. Discussion

6.1. Food Affordability Index

The Food Affordability Index (FAI) not only confirmed the researcher’s prior ranking of grocery store affordability around the city, but also confirmed the general rankings of fourteen of the fifteen interview participants. This suggests that grocery store affordability levels may in fact be common knowledge, or at least, widely known amongst local populations. At the most expensive end of the spectrum, the two downtown stores, Goodness Me and Market Fresh, are about two to two and a half times the cost of the most affordable grocery stores in the city (FreshCo, No Frills, and Food Basics). What distinguishes these two expensive stores from the more affordable stores is that they offer a wide selection of organic produce, organic food products, and other specialty food products that are not available in most other stores. For example, if one were to require a gluten-free diet or another type of special diet, these health food stores may prove to be a vital resource to procure a variety of appropriate foods to meet one’s needs. Thus, these stores can be said to offer something unavailable at regular full-service grocery stores and thereby provide an important service to the community. As shown by the FAI, these organic and specialty foods come with a much higher price tag, and due to their higher price tag are not equally accessible to people of lower income levels. The potential health benefits of eating more organic foods or of eating a special diet (ie. gluten-free or diabetic) are limited for low-income individuals in comparison to middle- and upper-income earning individuals. It is therefore likely that the inaccessibility to
organic and specialty foods for low-income individuals can be seen to exacerbate the well-documented health disparities (Daucet et al., 2006; Pomerleau et al., 2006; He et al., 2006; Carter et al., 2010; Boffetta et al., 2010; Ledoux et al., 2011) and diet quality differential between upper- and lower-income earners (Drewnoski & Specter, 2004; Darmon & Drewnoski, 2008).

As shown in the series of Food Affordability Indexes, the difference between the low-variance in meat prices between stores and the high-variance in fresh fruit and vegetable prices between stores, implies that fresh produce is much more costly at high-cost stores in comparison to low-cost stores, and thus more inaccessible to low-income shoppers who find themselves in mid- or high-cost stores. Meats, on the other hand, have a much lower price variance between stores and are thus slightly more accessible at high-cost stores than fresh fruit and vegetables are, for low-income shoppers.

One shortcoming of the FAI is that its calculations were based on only one round of price collections instead of combining several rounds of price collections to produce more robust results. Thus, it can more accurately be described as an approximate index rather than being a definitive index, due to the increased variance of the smaller sample of prices. Since the prices if the FAI as is stands aligned with fourteen of the fifteen interview participants’ subjective rankings as well as my own, it is unlikely that there are any major inaccuracies in the overall ranking. As it
stands, the presumption for the FAI calculations are that the sale items from each grocery store at the time of price collection balance out across the sample.

6.2. Food Environment Mapping

The series of maps shows that the food environment of Guelph is filled with food mirages and food deserts. One particular area of the city, the further North-east end of town, that is a sprawling food desert, has received local attention from both newspapers (McNaughton, 2017) and the local Community Health Centre food security initiative, The SEED, for its lack of food availability. A Zehrs store had been scheduled to be built in that area earlier in the 2010s but was sidelined indefinitely as the property development corporation complained that there were not enough residents in the area to support the store. Looking again at Maps 1-3, we can see that the North-east end of Guelph (above and right) is a large area without a single grocery store, thus, the need for a grocery store is clearly evident. Notably, the store that was planned to be opened was a Zehrs (FAIS 1.32), a mid-cost store that wouldn’t be an ideal store for the <LICO population of the area, although a Zehrs would in fact match the overall mid- to upper-income characteristic of the area.

Interestingly, Map 3 shows that the downtown area as well as the areas to the East (the Ward) and the South-west of downtown, have much higher prevalence of <LICO residents, with many more individuals living <LICO than in the North-east end. The food mirages in the downtown area and in The Ward, as well as the food deserts
around downtown (especially to the South-west of downtown) surely merit further attention from city planners, developers, and stake-holders, considering that a valid argument can be made that a much larger concentration of low-income residents are negatively impacted by the current food environment in the central area of town than in the North-east end of the city.

Cummins et al. (2014) illustrated that opening a higher cost grocery store does not significantly affect the shopping behaviors, shopping locations, and physical health of lower income residents due to the barrier of high cost. The relatively recent opening of the Goodness Me grocery store in the downtown area is an exaggerated example of this conclusion due to it being on the extreme end of high-cost stores. Although there has clearly been a need for a lower cost grocery store in downtown Guelph for many years, as shown on the maps above, a Goodness Me was built, thus exacerbating the food insecurity in the area, as low-income residents now occasionally spend a premium just to buy the occasional food item closer to home.

Freeman (2007) uses the term “food oppression” to refer to the lower density of grocery stores and higher density of fast food restaurants in low-income and minority communities, due to the negative impacts on health that both of these trends entail. Although at first glance one would not think of Guelph as an “oppressive” food environment, an argument can be made that such is the case in downtown Guelph specifically. Since downtown Guelph does have several high-cost grocery stores, again it cannot be said that the area fits cleanly into Freeman's
definition of food oppression, which implies a complete lack of grocery stores, a la food deserts. However, since researchers consider food mirages to have a similar impact as food deserts on food accessibility and health, downtown Guelph’s designation as a food mirage is not a far cry from Freeman’s original definition. Considering that food mirage designation along with the reality that the downtown area is home to (1) a 25.6% proportion of residents living below the Low-income Measure (LIM) (which is a measurement equal to precisely half of the nationwide median income) and (2) the largest concentration of the major chain fast-food shops and local independent fast-food shops in the city, one can begin to see a curious trend.

Accepting this food mirage-centered variation on Freeman’s definition of food oppression, I will add three more points. The first point is that downtown Guelph is slowly gentrifying: the 25.6% <LIM population proportion in 2016, was down significantly from the 42.7% <LIM population proportion in the 2011 census. Due to the very recent construction and completion of several high-cost high-rise residential buildings in the downtown area, it is easy to deduce why the proportion of <LIM residents is going down. Since more new high-cost condominiums are being built as we speak, this recent trend will only continue moving forwards. Secondly, two of the fifteen interviewees who live in downtown Guelph have both complained of having experiences with racial discrimination in both grocery stores and with emergency food services in downtown Guelph. These two men also travel the furthest distance - both traveling over 6km round-trip - of any of
the interview participants in order to buy their groceries. Without a doubt, they have been negatively affected by their experiences accessing food in downtown Guelph. And lastly, touching on more of the interview data regarding the social ecology of the various grocery stores across the city, many participants described the clientele of downtown grocery stores as “upper-class,” “high class,” “white” and “mostly white,” while the clientele of low-cost grocery stores were described as “low-income,” “minority,” and “immigrant.” No other contrary or conflicting descriptions were provided by any of the interview participants. Notably, two POC participants stated that they had not experienced racial discrimination at downtown stores or emergency food services, although they did describe a racial difference in clientele of the downtown stores in comparison to lower cost grocery stores, which matched the above descriptions. Thus, we can surmise that there is at minimum perceived status- and racial- symbolic boundaries operating in the grocery stores in downtown Guelph.

These points suggest that there is an argument to be made that the mostly white ever-gentrifying downtown Guelph core can be seen as a place where elements of food oppression negatively impact the low-income and minority individuals who live there.

Lastly, one intentional omission from the food environment map and FAI was the Guelph Farmer’s Market, which is very likely to be the cheapest place to buy food in downtown Guelph, albeit still within the mid- to high-cost end of the price index.
The reasons why the Farmer's Market was omitted are clear: (1) it only occurs one morning per week from 7:00am until noon, and (2) it very likely does not contain 80% of the NFB items (I can only say “very likely” due to my own regular personal experience there). Furthermore, although it is very likely to be the cheapest downtown option, it is almost certainly still more expensive than the mid-cost grocery stores in Guelph, due to its focus on local small farms, with some organic food vendors and conventional produce resellers. Although no realistic case can be made that the Farmer’s Market cuts through the food mirage in downtown Guelph, it is the cheapest option for low-income shoppers who either need or prefer to shop downtown. In fact, four participants stated that they shop at the Farmer’s Market, one of them stating that it was their primary place of food shopping. Until a low-cost full service grocery store opens up in the downtown area, the Farmer's Market deserves no shortage of attention for being the cheapest option for food shopping in downtown Guelph.

6.3. Interview and Survey: Quantitative Analysis

The first point of discussion for the quantitative data is the gender differences in the outcomes for many different questions and categories. The survey and interview responses showed that females had significantly greater Fresh Fruit and Vegetable Intake (FFVI), higher monthly food budgets, traveled shorter distances for food shopping, shopped more frequently, and had higher overall incomes. The Canadian Community Health Survey (2016) shows that females in Canada do consume
significantly higher amounts of fruits and vegetables than males do, thus there is nothing surprising in that regard. Female's higher incomes in the sample can surely explain at least part of their increased monthly food budget and food shopping frequency. An interesting result here is that males typically traveled an average of 2.4km for food shopping, while females traveled 1km. Of the eight participants who live within 1km of downtown Guelph, four of the five females all shopped at the expensive grocery stores downtown close to their homes, while the three downtown-dwelling males all traveled a minimum of 2.8km to their place of food shopping outside of the downtown area. It appears possible that the female's increased incomes also allow them to shop downtown somewhat more frequently, thus reducing the total distance they travel for food shopping.

A very high proportion of the sample was not only food insecure but was “severely food insecure,” which according to the CCHS (2015), includes missing meals and having reduced food intake. Sixty percent of the sample reported skipping meals, while one other participant reported that she greatly undernourished herself in order to adequately nourish her children, thus a full two-thirds (67%) of the sample can be said to be severely food insecure. Considering that according to the CCHS those who are severely food insecure make up roughly 20% of all food insecure households, we can see that the study sample represents some of the more severe cases of food insecurity rather than more moderate experiences with food insecurity.
Since two of the main recruitment sites for the study were the Ontario Works office and the Guelph Community Health Centre, which both serve low-income and disproportionately unemployed clients, it is possible this may explain the number of severe food insecure participants in the sample. None of the participants had full-time permanent employment and the average annual income of the group was more than $1,000 below the LICO, thus the sample does represent those amongst the lowest end of the income spectrum for Canadians.

All but one person from the sample stated that fresh fruits and vegetables were considerably lacking from their diet. The males in sample consumed fruits and vegetables (processed and fresh) an average of 1.8 times per day, whereas females did so 4 times per day. Considering that the Canada Food Guide (2017) recommends an average daily intake of 7 servings of fruits and vegetables per day, we can see that these foods are severely limited in the participants’ diets, even when keeping in mind that the majority of Canadians do not meet this recommendation. The reduced consumption of fruits and vegetables in these <LICO individuals diets puts them at an increased risk of developing a major chronic disease as fruit and vegetable intake acts as a buffer to cardiovascular disease, diabetes, and some forms of cancer (Daucet et al., 2006; Pomerleau et al., 2006; He et al., 2006; Carter et al., 2010; Boffetta et al., 2010; Ledoux et al., 2011).

The limited intake of fruits and vegetables in this <LICO sample also reflects the research of Darmon and Drewnoski (2008) who showed that Fruit and Vegetable
Intake follows a socio-economic gradient. This finding was also confirmed in the Canadian Community Health Survey (2015). Pierre Bordieu, in Distinction (1984), suggests that lower-class households consume less fresh fruits and vegetables due their lack of “cultural capital,” or cultural knowledge, rather than due to the economic capital, per say. Since lower-class families lacked the socialization of eating fresh fruits and vegetables multiple times per day, he suggested that the cultural disposition, or “habitus,” to not eat fresh foods would most likely be passed along generationally. Considering that about half of the interview participants held a Bachelor’s degree or higher (several of which had previously worked professionally), one was attending college, and all but one had completed high school, it was interesting to see that several of the participants with BA and MSc degrees experienced lower levels of fruit and vegetable intake (FVI) despite possessing significant cultural capital. The sample was too small to generalize the relationships between FVI and income and/or education, and the results were truly mixed. Since I did not ask participants for their parent’s income, job, and education information, I would have no way of establishing family class or status level, in order to attempt to access the individual’s cultural capital inheritance, as Kamphuis et al. (2015) had done in their recent study.

Aside from the two participants who already live within a 1km walk distance to a low-cost grocery store, over half of the sample (seven of the remaining thirteen in this example) stated that they would consume more fresh fruits and vegetables if they lived within a 1km walking distance to a low-cost grocery store. Two
additional interviewees stated that they wouldn’t eat more fresh fruits and vegetables per say, because they already ate a large enough amount everyday (5+ times per day), but in that case they would save a lot of money through buying lower priced fruits and vegetables, which would help their overall financial situation significantly. If you further extract the three car-drivers from the above list, since driving a car expands your shopping geography, you are left with eight of nine participants stating that proximity to a low-cost grocery store would increase their fruit and vegetable consumption. Lastly, considering that the one participant who responded no to this question was a retired man who is not food insecure, not financially stressed, has an income about $5,000 above the LICO, and feels that nothing is lacking from his current diet (and therefore is a major outlier in the sample based on these criteria), we can see that proximity to low-cost grocery stores is at minimum perceived to be a significant barrier to eating more fresh produce.

All but one of the sample correctly described the affordability rankings of the various grocery stores across Guelph by listing them very closely to the FAI results. Although this outcome may appear surprising, it has been shown that low-income shoppers generally possess a more accurate knowledge of store prices due to their constantly weighing out financial trade-offs when shopping (Mullaination & Shafir, 2013). In this regard, the degree of financial scarcity acts to sharpen their memory and attention to price information.
Although prior research has shown that low-income individuals on average travel 1.6km past the nearest grocery store to their house in order to shop (Cannuscio et al., 2014; Shannon, 2016), the current sample traveled an average distance of 650m beyond the nearest grocery store in order to shop. Although this distance is considerably lower than those shown by prior research, it is notable that the present study did not include all places of shopping for each participant but only the one place that the participant listed as their primarily shopping location. In many instances, participants did travel to further grocery stores, although that information was not thoroughly documented as it was in the aforementioned research. Thus, the stated result of 650m is likely much lower than the actual value.

One further point of concern regarding the collection of information regarding participants’ usage of emergency food services, is the accurate self-report of such information. In my direct experience with this study, I witnessed one of the participants entering the local soup kitchen after stating on the survey and in the interview that they had not accessed either. This occurrence cannot be seen as surprising due to the stigma associated with emergency food services.

6.4. Interviews: Qualitative Analysis

6.4.1. Food Affordability

Food prices, to a large degree, dictate what a person with a low-income and limited food budget can afford to access. When individuals cannot afford to purchase an
adequate amount of healthy foods, they resort to eating less healthy foods fresh whole foods, less variety, a lesser quantity, and in the worst cases, to skipping meals altogether. When due to the high cost of food they are not able to obtain enough food they often resort to emergency food services, which offer mostly canned and processed foods along with days old produce.

“A ten ingredient soup turns into a four ingredient soup when I shop at overpriced stores,” stated one of the female interviewees, who also spoke of her rationing foods and skipping meals on a regular basis. “And they want to build a new Zehrs,” she scoffed, referencing the proposed East end Zehrs plans that have been indefinitely shelved, “as though that would actually do anything.” Understanding the cost of food very intimately herself, she expressed an understanding that Zehrs was a higher cost grocery store and a place that she would struggle to afford to shop at. Opening up a new Zehrs would do very little to abate her own severe food insecurity, or for others in the same financial boat.

The price of food downtown is “high versus high everywhere,” stated a food secure retiree, while a severely food insecure single mother stated that “food is too expensive everywhere!” For those living <LICO with food insecurity, all food is too expensive and there is never enough, especially when it comes to fresh whole foods, which for them are greatly restricted. An average monthly food budget of $208.53 is simply not enough to eat a healthy diet and avoid using emergency food services
and/or skipping meals. At that level of income and food budget, every little bit of savings, sales, or discounts has a profound impact on an individual’s diet and health.

6.4.2. Transportation

The second most challenging factor interviewees listed was transportation to and from their preferred place of food shopping. Although having access to a car incurred costs for gas as well as unpayable repair expenses, the participants who had access to cars were able to shop by the flyer, traveling to whichever grocery store had the best sales on for what the individual needed. Without a doubt, the availability of automobile transportation increased their physical access to affordable foods and reduced the encumbrance of transporting foods. Still, two of the 3 drivers were severely food insecure and experienced significant financial stress due to the costs of maintaining a vehicle. A fourth car-owner, unable to pay for car repairs, has not been able to drive for over a year. Therefore, although driving a car reduced the physical barriers to food access, it increased the financial and psychological stresses associated with food shopping. In the end, the costs of maintaining a vehicle (repair, insurance, gas) canceled out any potential savings by shopping at lowest cost stores, and if anything created more stress.

Walking, although promoting physical activity, can be limited for those who are physically disabled, obese, in their old age, or for everyone during the colder winter months. Two long distance walkers in the sample complained of serious foot pain,
and neither matched any of the health criteria listed above, as both were young or middle aged men in relatively good health.

Using the public transit system (bus) had mixed reviews, mostly due to the fact that limited bus routes and infrequent times were a “nuisance” for some would-be transit users. Shannon (2016), studying shopping patterns in Minnesota, found a higher proportion of shoppers to be using public transit regularly than my current results reflect here in Guelph, although his study incorporated a wider variety of income earners and as noted, occurred in a different city with a different (and possibly more efficient) public transit system.

6.4.3. Emergency Food Services

Anthony Winson (2013) points out that the eminence of the highly processed high-fat, -sugar, -salt “industrial diet” of modern origin, is a key factor in the increase of major chronic disease across the world. Canadian food banks, for the most part, dispense mostly highly processed and canned foods in order to prolong their shelf-life, that fit Winson’s industrial diet description. One single mother who ate most of her household’s monthly food bank allotment herself in order to provide her children with better quality foods, stated that eating food bank food was most likely “worse than skipping meals due to the toxicity in the food.” She further expressed a desire to lose weight but said that she struggled due to the nutritionally deficient foods that she relied upon.
Separate from the low quality of food bank foods is the stigma associated with food banks and soup kitchens. The University of Toronto’s Food Insecurity Policy Research group (PROOF, 2016) points to the massive discrepancy between the 882,188 Canadians listed as accessing food banks annually compared to the over four million Canadians suffering from food insecurity. They claim that the primary reason for this discrepancy is that the majority of food insecure persons still don’t think a “person like them” would access a food bank. Thus, there exists a social stigma towards usage of emergency food services. Furthermore, it is likely that some experiencing food insecurity either avoid or reduce their food bank use due to their reputation for dispensing mostly highly processed low quality foods that are inappropriate for individuals with specific dietary needs.

Local soup kitchens and meal services were seen by all but one participant who had accessed them as being overrun with drugs, violence, bullying, discrimination, and police presence, to the degree that they felt uncomfortable and/or unsafe in those spaces. From a social ecological perspective, we can see that the social atmosphere of a shared space can incorporate physical as well as symbolic boundaries based on the characteristics and dispositions of the clientele (Cannuscio et al., 2014; Sullivan, 2014). In the case of the local soup kitchens in Guelph, due to the common perception that they are more youth- and drug addict-oriented services, it can be said that they present both a symbolic- and physical-boundary for persons wishing to eat a much needed meal in peace.
6.4.4. Skipping Meals and Undernourishment

One participant described how she would go several days without eating a “healthy meal with a salad” and then all of a sudden be overcome by her hunger and do everything within her power to procure one. The next day, she would return back to her normal routine of “eat[ing] carbs in order to pay a bill.” Several other participants described regular rationing, making soups instead of substantial meals, or eating food they knew to be less than optimal. Making it by with less than optimal foods was a near constant in the study sample. The mental and physical toll that this degree of food insecurity takes is enough to significantly alter one’s daily energy levels and psychological outlook, making it much more difficult to find and maintain employment, relationships, and make meaningful progress on improving one’s life circumstances. There is no doubt that food insecurity only exacerbates any problems related to unemployment as well as mental illness and physical health conditions, short-term and long-term.

Tarasuk et al. (2015) showed that the average annual healthcare expenditure for a severely food insecure individual ($3930.00) is well over double the healthcare expenditure for a food secure individual ($1608.00). The difference between those two amounts is $2322.00, which when calculated monthly would be $193.50 per month. Considering that the average monthly food budget for the 10 severely food insecure individuals in the sample was $170.30, those additional funds if applied
monthly would more than double their food budgets, allowing for the purchase of an adequate amount of food, let alone significantly more fresh produce and meats. Potentially, the redirection of these public health funds on its own could contribute towards the elimination of severe food insecurity.

6.4.5. Social Programs

Since many food insecure and severely food insecure individuals rely on social assistance (OW and ODSP), it is noteworthy that the social assistance allotments in Canada have been designed at their current ultra-low rates ($721.00/month for a single adult on OW, $1128.00 for a single adult on ODSP). Despite the average cost of rent for a one bedroom apartment in Guelph having a 2018 value of $972.72 cost plus extra utility costs, it is no wonder that those in receipt of social assistance face a challenging time finding adequate food, let alone adequate healthy foods.

Furthermore, newly landed refugees face challenges transferring educational credentials and acquiring English language skills, and thus, many are unemployed and either reliant upon or reluctant to rely upon social assistance. The ultra-low social assistance amounts negatively impact many new persons arriving in Canada, subjecting them to food insecurity and significant financial stress (Simich, Hamilton, & Baya, 2006; Luck, 2017).

6.4.6. The Social Ecology of Grocery Stores
The social ecology of grocery stores effects grocery store selection (Cannuscio et al., 2014; Shannon, 2016). From the demeanor of cashiers to the responsiveness of store managers, as well as the socio-cultural demographics of the surrounding shoppers, shoppers possess and awareness of how comfortable they are navigating through different social environments they come across while food shopping. High-cost stores have been noted to be perceived to cater towards shoppers with higher incomes, while low-cost stores - for example No Frills or Food Basics - advertise their simple services in their very names, while stripping down all of the extra services and fancy presentation that keep business costs and food prices up. Thus, if the high-cost of food is not a barrier for lower income shoppers, then the symbolic boundaries of class, status, and race all may be. Different forms of discrimination certainly have the power to influence individual’s food shopping patterns, selection, as well as the usage of food vouchers, to the detriment of the low-income shopper.

Shannon (2016) also points to criminal activity in an area to describe why some shoppers travel far outside of their own neighborhoods in search of groceries. Although Guelph is a very low-crime city overall, even by Canadian standards, one participant who lives in a higher crime area of Guelph, stated that police stoppages and being followed around stores by security guards were a common and psychologically stressful experience. In this participant’s case, it could be further detrimental to his health for him to be discouraged from shopping at the low-cost
grocery store in his neighborhood to avoid these unwanted experiences with police and security, for other options would likely be much more expensive.

**6.4.7. Food Quality**

During the planning stages of the current research, a local low-cost grocery store manager explained to me that all of the major grocery store corporations (Loblaws, Sobeys, Metro, etc.) own and operate both higher- and lower-cost grocery store chains. For example, Loblaws Inc. operates both Zehrs (mid-cost) and No Frills (low-cost) amongst other stores, while Metro operates both Metro (mid-cost) and Food Basics (low-cost). The store manager further explained that the primary difference between the food that is shipped out to the low- and mid-cost stores, is that the food heading to the lower cost store was permitted to sit in that corporation’s warehouse up to 48 hours longer. Many shoppers in the current study noted the “marked” difference in the quality of fresh produce and meats between the lower and higher cost grocery stores, although it wasn’t a consensus. Although it is not within the breadth of the current study, further research focusing on the differences in fresh food quality between the different grocery stores is recommended.

A further divide in food quality exists between the higher-cost local organic foods available at higher cost grocery stores, health food stores, and farmer’s markets, and the lower-cost conventional imported foods available at lower cost grocery stores as
well as at higher cost stores. Local organic foods are widely touted as fresher, healthier, more ecologically friendly, contain less “harmful” chemicals, and are associated with elevated social status, while they are also widely known to come with a significantly higher price tag, thus excluding many low-income shoppers and certainly those experiencing greater food insecurity. “High class food” was the term employed by one the participants to describe the local organic foods available downtown, while adding “I can’t go in.” This is certainly one of the greatest conundrums of the local organic small farm movement: many organic farmers come to be such through social activism and countercultural movements that they were exposed to in their younger years, only to wind up growing higher quality food almost exclusively for middle- and upper-income earners, which low-income persons cannot afford.

Furthermore, in Distinction (1984), Bordieu describes the different cultural tastes of the various social classes in mid-twentieth century French society and he refers to the lower end of the working class as being incapable of cultivating taste. According to him, taste “presupposes the freedom of choice,” and thus the low class experienced only the “the paradox of the taste of necessity.” The ‘paradox’ here referred to the incapability of developing taste of the lower class and ‘necessity’ here referred to the “economic necessity... for what they are anyway condemned to” (1984, p.177-178). When discussing the plight of those living with severe food insecurity in Guelph - skipping meals, undernourishment and reluctantly relying on food banks - it is easy to draw a parallel to Bordieu’s concept of the “taste of
necessity.” Although interestingly, many of the participants in the current Guelph study had lengthy periods of time in past phases of their lives working as professionals with middle-class salaries, owning vehicles, in marriages, with plenty of money. Thus, many have experienced both the various tastes that Bourdieu describes as well as the boredom, hunger pangs, and stressed out shopping trips that come from living a life at the level of necessity. Thus, even low-income individuals in Canadian society are likely to have a variety of experiences throughout their lives eating different qualities and quantities of a variety of foods.

Although she experienced considerable financial stress to enable her to eat a mostly organic food diet, one of the participants expressed great pride in and stressed the ecological importance of eating organic foods. She took pride in being healthy and eating a whole food diet. She was certainly an outlier (earning slightly above the LICO), her $400.00 monthly food budget double the average of the sample, but she also serves as a good example of how much an extra $200.00 per month can positively influence the quality and variety in one’s diet, as well as one’s sense of being able to eat a complete and healthy diet.

6.4.8. Strategies for Obtaining Healthy Foods

According to a Value Chain Management International report by Gooch and Felfel (2014) on food waste in Canada, 40% of the food produced in Canada ends up wasted, with just under half (47%) of that total waste occurring in Canadian
households. A few of the participants spoke at length about their concern and sensitivity to the omnipresent food wasting they witness everywhere around them. One man responded by taking partially rotten food from the garbage at a local soup kitchen and preserving it. Another woman described taking the “seconds” or bruised and/or damaged produce from vendors at the farmer’s market. Others spoke of being sure to never waste food in their homes. One woman pointed out that her restricted food budget made it easy to not waste food and she expressed pride in not wasting or needlessly over-consuming. This marked a rare moment during this research, where a participant found a source of pride in something – in this case, not being wasteful and not over-consuming – amid the sea of stressful experiences with food insecurity and financial stress.

Although only three of the participants grew their own food in a community garden and one in a personal garden, several others expressed past experience and renewed interest in gardening. All but one of the participants stated that free-time was not a concern for them regarding grocery shopping, therefore it stands to reason that some lower income individuals may well have enough extra time to devote to a garden if the space were available in a community garden. Community gardening is certainly a creative, community-oriented, and educational way to increase fresh food intake at a very low cost.

One area of concern that came up in the study was predatory lending, which was exemplified by the participant who pawned his tablet for $40.00 in times of need,
only to pay $50.00 to re-acquire it from the pawn shop within the next thirty days. He stated that he had done this countless times. That rate of interest is astronomical and appears to be predatory. This point underscores how difficult it is for low-income persons to receive low-interest lines of credit and credit cards, instead turning to payday lenders and informal high-interest credit arrangements.

6.4.9. Financial Stress and Mental Health

From the descriptions of the participants, financial stress permeates every facet of life. Every decision, from exercise to social life to simply choosing to leave the house or not, is seen as a trade-off or transaction that incurs a cost. Even eating a healthy meal one day often entails eating unhealthy for several more. Many participants placed food-related stress at the top of the list of types of financial stress, as diet quality, lack of variety, and stress hormones is how financial stress translate to bodily form. Mullainathan and Shafir (2013) describe how financial scarcity taxes an individual’s “mental bandwidth,” thereby reducing the amount of attention that is available for other tasks, however simple or complex they are. From a social policy standpoint, more certainly needs to be done to alleviate food insecurity and financial stress from low-income households in order for them to grow and prosper. The current food-insecurity stress-inducing level of social assistance is legislated cruelty that can be described as torturous.
A simple counter-example to the current food-insecurity and stress-inducing social assistance programs in Canada are the Old Age Security (OAS) and Guaranteed Income Supplement (GIS), which low-income Canadians over the age of sixty-five receive monthly. According to Tarasuk et al. (2014), food insecurity is rare in the over sixty-five population due to Canada’s generous old age pension programs. The combination of the monthly payments for the OAS and GIS equals $1462.89 for single adults with no further income (Government of Canada, 2016), which is over $300 per month higher than the Ontario Disability Pension (ODSP) and over $700 per month higher than Ontario Works (OW). Based on the case of old age pension programs in Canada, it is very easy to see how increasing social assistance benefits will significantly lower and could attainably eliminate food insecurity in Canada.

6.4.10. Study Limitations

The limitations of the current study include:

(1) The sample size \( (n=15) \) of interview participants being too small to (1) generalize the results, and (2) to run multiple regression analysis, which would have allowed for the exploration of the interactions of different factors related to food insecurity and socio-demographic information.

(2) The qualitative analysis, by not incorporating analytical software (or transcription), may have omitted themes of interest, which were not uncovered in the present study.
(3) The sample included two persons living with an annual income several thousands of dollars over the LICO (although both were still below the Low-Income Measure), while the study inclusion criterion specified living below the LICO. (Nonetheless, those living above the LICO proved as interesting counterpoints to those living below the LICO). Further studies in this area could potentially include those living below the LIM, instead of below the LICO, to incorporate more experiences of the working poor.

(4) The exclusion of the CostCo, Taskgo, and Tan Phat grocery stores from the Food Environment Maps. Although each of these three stores were located on the periphery of the city, and in the case of CostCo were much less likely to be frequented by those living below the LICO (due to memberships fees, distance, bulk purchasing, etc.), still there inclusion would have made for a more accurate and complete map.

(5) The exclusion of a socio-spatial analysis based on where specific participant’s homes were located. By excluding that information, the present study missed the opportunity to do a more in-depth analysis of food shopping and transportation alternatives. Privacy/ethical concerns limited this possibility in the present study.

(6) The self-report of Emergency Food Services, such as food banks and soup kitchens, as well as of dependence upon social assistance programs and employment status, can be unreliable due to the stigmatization of said services as well as of being unemployed. Future studies could include more
in-depth interviews, in order to build a greater rapport with participants, in hopes of receiving more reliable self-report data.

(7) Parental income and education information would be necessary to complete an evaluation of "cultural capital" among the participants (as Kamphuis et al. (2015) showed), which would meaningfully add to the scope of studies on food choices and food insecurity going forward.

7. Conclusion

Those in the <LICO demographic, near the bottom of the income scale in Canadian society, are the hardest hit by food insecurity, financial stress, and physical illness and major chronic disease. The gradual reduction (when factoring inflation) of welfare allotments over the past two decades coupled with the increased price of foods, rent, and other basic necessities, have significantly aggravated the circumstances of those who rely on them. A 2014 Statistics Canada report shows that the value of the minimum wage in Canada has stagnated since the mid-1970s, while again, the price of foods, rent, and other basic necessities have significantly increased relative to the value of the minimum wage (Galerneau & Fecteau, 2014). Randalin Ellery of the Guelph Wellington Poverty Task Force (2015) completed a study showing that a “living wage” in 2015 dollars was $16.50 per hour, whereas in 2015 the minimum wage was $11.25 per hour. Although the minimum wage was raised to $14.00 per hour in 2018, that is still several dollars below the “living wage” as calculated by the PTF, after factoring inflation over the past three years. The
increase of precarious short-term and part-time employment in Canada only adds to the growing pool of working poor who work jobs that do not provide a living wage. Thus, food insecurity across Canada has been on the rise.

The Food Affordability Index that resulted from this study shows us clearly that one dollar spent at a low-cost grocery store buys roughly two times the amount of food as one dollar spent at any of the high-cost grocery stores in downtown Guelph, and roughly 25% more food than one dollar would buy at a mid-cost grocery store. Furthermore, the Fruit and Vegetable Affordability Index shows even greater disparities between different grocery stores, showing that one dollar at a low-cost stores buys about two to three times as much fruit and vegetables as the same money would if spent at a high-cost grocery store in the downtown area. The FVAIS shows that the fruit and vegetables sold at mid-cost grocery stores are a full 50% higher priced than at low-cost grocery stores. However, although the Meat Affordability Index shows that there is much less overall variance across different grocery stores, high-cost stores still cost roughly 50% more than low-cost stores, while mid-cost stores cost 20-30% more. Therefore, considering the limited monthly food budget of those living <LICO, shopping at low-cost grocery stores over other options increases one’s purchasing power significantly, especially regarding fresh fruits and vegetables, which are precisely the health-boosting food types most typically lacking from the diets of those living with low-incomes.
Mapping the food environment clearly displayed that a significant portion (approximately 50%) of the city of Guelph is a food desert, while also showing downtown and the East-of-downtown area (the Ward) to be food mirages along with several other areas across the city. Since food mirages have similar effects to food deserts - of restricted fresh food accessibility and affordability - we can see that when factoring them in to the map that an even larger area (an additional 25% approximately) of the city is negatively impacted for low-income shoppers due to lack of proximity to a low-cost grocery store. Thus, food mirages should be highlighted as areas, similar to food deserts, where food insecurity is aggravated, especially when, as illustrated, those food mirages are located in lower-income areas. This is an important consideration for city planners and policy makers, who may be tempted to overlook food mirages like downtown Guelph as areas that do not need further attention, when in fact these are the precise areas in dire need to affordable food options, due to their higher density of <LICO residents and centrality.

Information collected through the surveys and interviews shows that the sample reflects the experiences of those living with marginal food insecurity (3 participants) and severe food insecurity (10 participants). The sample on average consumed far below the Canada Food Guide recommendation of 7 servings a day at roughly two per day for males and four per day for females. All but one participant stated that fruits and vegetables are currently lacking from their diet, while over half stated that meat is also lacking from their diet. Just under half of the sample
stated that their fruit and vegetable consumption would increase if they lived within a 1km walk distance to a low-cost grocery store, while two participants said that it would “possibly” increase. Seventy-three percent of the sample stated that they buy more food when they shop at low-cost grocery stores in comparison to when they shop at higher-cost grocery stores. All but one participant named ‘cost’ as the greatest barrier to obtaining adequate healthy foods, while roughly half stated “transportation” as a barrier. Taken together, these results suggest that increasing the geographic availability of low-cost foods may prove to be helpful in reducing the negative effects of food insecurity through increased fruit and vegetable consumption as well as overall food consumption.

The interview data shows that the sample had an accurate knowledge of the differences in food price levels at the different grocery stores they shop at. Participants described differences in the social ecology of different stores, referring to low-cost stores as places where lower-income and minority shoppers frequented, while identifying higher-cost stores as white middle- and upper-class stores, thus illustrating the symbolic boundaries that are present at different grocery stores. Some participants had experienced direct racial discrimination at stores and emergency food services, which affected their choices regarding stores and use of emergency food services.

Those who did occasionally shop at high-cost stores typically did so infrequently and in a highly selective manner, buying much less food than they otherwise would
at a lower-cost grocery store. Some participants described a marked difference in food quality between grocery stores while others described the difference to be only in packaging and presentation rather than reflecting an actual difference in quality. Many found the quality of food dispensed at food banks to be critically low, consisting of over-processed, stale or rotting, and in some cases toxic foods. Local soup kitchens were described as uncomfortable settings with drug dealing youths and addicts, bullying, discrimination, and police presence. Food vouchers were the preferred method of receiving emergency food aid.

Although cars increased physical access to low-cost grocery stores, the costs associated with maintaining a vehicle often negated any savings to be gained in the process. Public transportation worked well for some, but for others was inconvenient, involving lengthy walks to bus stops and waiting times that negated the practicality of their use.

Participants also described high levels of financial and food-related psychological stress resulting from not being able to afford adequate healthy foods for themselves and their families, skipping meals, undernourishment, rationing, lacking variety, relying on limited social services, and more. Participants described social assistance as being far from enough to provide one with adequate healthy food and other basic necessities, and thus trade-offs and sacrifices were commonly made, for most occurring on a daily basis. Many ascribed their mental and physical illnesses to
their poor quality of diet and expressed a belief that eating a healthy diet would reverse their conditions.

8. Recommendations

As a student researcher, and even as someone who has experienced food insecurity at times in my childhood as well as my life as a young adult, I was entirely moved by the stories and life circumstances that were described to me by the participants in this study. For me, it was one thing to read the studies and statistics about growing food insecurity in the North American context and freak out about the millions of children and adults living with food insecurity, under the abstract veneer that large numbers and percentages often engender. It has been an utterly different experience to sit for an hour in the same room as a man who lives two blocks away from my house and eats one meal a day and has not eaten a fruit or vegetable in over a year, or to hear about another living close by doing weekly fasting due to his lack of food, or a middle-aged man with a graduate degree in the sciences talking about suicidal thoughts arising from his inaccessibility to the foods he needs due to his multiple health conditions. It has also been a meaningful experience to hear that mothers have skipped meals and undernourished themselves to feed their children - and then in times of turmoil, faced food insecurity at Shelters - and to hear multiple participants state that their poor quality diet has a profound impact on their physical and mental health and is directly implicated in the development of their illnesses. And then to hear a retiree state in one word that he does not experience
any financial stress whatsoever and that he gets everything he needs from his current diet, or another retiree saying that she “makes it by just fine.” Personally, this has been profoundly impactful research.

Although it is important to create a Food Affordability Index and map out the food environment in Guelph in order to visualize and understand the socio-spatial dynamics, it is an entirely different experience to take a closer look at the day to day circumstances of those living <LICO with food insecurity. The qualitative data has served more as an intravenous blood transfusion, at least in my own experience, going beyond the abstract quantitative analyses that make the issue somewhat more tolerable. For having done this research, I am completely transformed and hope that reading this research will have a transformative effect on readers.

Further recommendations based on this study include:

1) A significant boost to both the current social assistance payments across Canada, in order to better meet the actual 2018 costs for average rent, an actually fresh healthy diet, and other basic necessities. The recommended boost in social assistance payments would no longer relegate those who rely on them to (severe) food insecurity, substandard housing, social isolation, and physical and mental illness. Increasing monthly benefits by even several hundred dollars per month has a significant impact on reducing household food insecurity for Canadians, as we can already see that the rates of food
insecurity are much lower in the over sixty-five population in Canada who receive a Guaranteed Income Supplement (Tarasuk et al., 2014). I would recommend a significant boost to the current welfare system before considering instituting a Basic Income, which almost certainly would involve slashing other vital social programs that low-income individuals rely on, according to the mainstream political rhetoric surrounding Basic Income (OCAP, 2017). Aside the debate over the various forms that a Basic Income could take (addressed by Young & Mulvale, 2009), the Ontario Government has undertaken a pilot study to test the impacts of a Basic Income, at the recommendation of the University of Toronto’s Hugh Segal (2016). Locally, both the Guelph Wellington Poverty Task Force and The SEED have long advocated for a Guaranteed Income or raises in the welfare benefits to food insecurity in the city.

2) Raising the minimum wage to a “living wage,” so that working poor households could avoid poverty and food insecurity. The Guelph Wellington Poverty Task Force (2015), in their work advocating for a “living wage” to help reduce poverty, calculated the living wage for an Ontario resident to be $16.50 per hour (37.5 hours per week) in 2015 dollars. Using the Bank of Canada online “inflation calculator,” that 2015 value would equal $17.43 per hour in 2018 dollars, which is a full $3.43 per hour above the current minimum wage of $14.00 per hour, which would translate to a difference of several hundred dollars income per month. In a high rent market such as
Guelph and other larger cities in Ontario, a “living wage” is crucial to bring citizens above poverty and food insecurity.

3) The prioritization of the construction of low-cost grocery stores in lower-income areas prior to building mid- to high-cost grocery stores in mid- to high-income areas, in order to reduce food insecurity. In the specific case of Guelph, I would strongly recommend adding a low-cost grocery store to the downtown area as well as another in the Ward, prior to adding a mid-cost grocery store to the higher income neighborhood in the North-east end of town, as has been proposed locally (see Map 3). The low-income residents in that higher income area - filled with higher income car-owners - will still have to leave their area to purchase affordable lower-cost foods at low-cost stores, because the proposed mid-cost store would not serve them. Please note that I am not suggesting to refrain from building new grocery stores where there are none, but rather stating that a proper diagnostic should be run that incorporates the socioeconomic status of neighborhoods and regions prior to building new grocery stores in cities. Regional socioeconomic information should be given considerable attention in the planning stages of grocery store development, to help identify the areas with the greatest need in order to reduce food insecurity. Furthermore, local social activists groups should also consider this information before rallying to build mid- to high-cost stores in higher income areas where almost everybody owns a car and is not food insecure.
4) In the specific case of downtown Guelph, there should be an acknowledgement of the current “oppressive” food environment existing there, with specific attention paid to the symbolic class- and racial-boundaries that exist around the high-cost boutique and health food stores that operate downtown currently. Food Oppression should thus be the primary rallying point for the movement to build a low-cost grocery store in downtown Guelph, as large numbers of low-income and minority food shoppers struggle to buy groceries in the current food environment that exists there. (Please refer to Section 5.2. for a more thorough discussion of this topic).

5) Emergency food services, especially those organized at churches and/or are organized primarily by volunteers, should be mandated to inform and educate volunteers and staff members (including management) on staff rights and security, as well as public rights and safety. Even though many administrators managing emergency food services programs have university educations, they still require ongoing education regarding issues of crisis/conflict management, racial and sexual discrimination, white fragility, intersectionality, transphobia, and other important topics of daily direct consequence.

6) For Women’s Shelters to provide more diet-, nutrition-, and food-related support for those relying on their services. Considering the high levels of stress and turmoil that women entering and staying at Shelters experience, the need for acute nutritional sensitivity during those times is more crucial
than ever, and should be reflected with quality meals adequate enough to prevent food insecurity.

7) The creation of community gardens in neighborhoods where there is social housing or anywhere there is a suitable garden space in a lower income neighborhood. Such an effort could be launched by local neighborhood group coalitions and sustained by avid gardeners.

8) The creation of a small initiative at the Guelph Farmer’s Market for vendors (especially the “organic” farmers) to offer their seconds and bruised foods, as well as donated foods, at significantly reduced prices reserved for lower-income shoppers. This not only could help reduce food insecurity, but also be a meaningful step locally to tear down the symbolic boundary between organic and local food culture and the low-income community.

9) Further studies on the impacts of food mirages and food deserts, including more qualitative and ethnographic work. Although I would like to think that the current study is thorough enough, it is still a master’s thesis with a very small sample size. Although the current study highlights existing issues, further research is recommended to better understand the full extent of the impacts of food insecurity, food affordability, and food accessibility.

10) Further studies that attempt to quantify the differences in quality of life, physical health, mental health, and food security, for those living at various income levels below the LICO. Based on the current findings, the author sees that although an annual income of $9,000.00 and one of $17,000.00 are both below the LICO, the later is almost two times the former and thus surely
offers significant benefits to that individual. Research exploring the impacts of different levels of low-incomes would be useful for informing social assistance increases in order to eliminate food insecurity, while allowing low-income earners to live in safe housing with their basic necessities met without sacrifice.

11) Further studies into “sources of pride” amongst those living with very low-incomes. One participant in the study emphasized her pride in not wasting and not over-consuming due to her restricted budget, which marked a rare moment of pride and positivity in the research interviews. Since the lower income demographic is one of the more voiceless and disenfranchised groups in Canadian society, further research in to the perspectives of the poor is highly recommended.

9. References


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10. Appendix

10.1. Food Affordability Index (raw data)

<table>
<thead>
<tr>
<th>Item</th>
<th>Fresh Co.</th>
<th>No Frills</th>
<th>Food Basics</th>
<th>Walmart</th>
<th>Metro</th>
<th>Zehrs</th>
<th>Angelino's</th>
<th>Market Fresh</th>
<th>Goodness</th>
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<tbody>
<tr>
<td>Milk (4L)</td>
<td>4.27</td>
<td>4.27</td>
<td>4.27</td>
<td>4.27</td>
<td>4.29</td>
<td>4.27</td>
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<td>5.55</td>
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<td>3.75</td>
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<td>2.2</td>
<td>2.22</td>
<td>2.64</td>
<td>2.56</td>
<td>2.44</td>
<td>4.98</td>
<td>3.38</td>
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<td>2.12</td>
<td>2.22</td>
<td>1.98</td>
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<td>2.74</td>
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<td>Yogurt, with fruit (750 g)</td>
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<td>Item</td>
<td>Quantity (g)</td>
<td>Calories (kcal)</td>
<td>Protein (g)</td>
<td>Carbohydrates (g)</td>
<td>Fat (g)</td>
<td>Calcium (mg)</td>
<td>Iron (mg)</td>
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<td>-------------------------------------------</td>
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<tr>
<td>Chicken Legs with Back (kg)</td>
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<td>19.33</td>
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<td>4.06</td>
<td>16.91</td>
<td>13.85</td>
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<td>19.33</td>
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<td>2.22</td>
<td>4.06</td>
<td>16.91</td>
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<td>Celery (900 g avg)</td>
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<td>Pita, Whole Wheat (284 g) (kg)</td>
<td>0.77</td>
<td>1.05</td>
<td>1.96</td>
<td>1.05</td>
<td>1.27</td>
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<tr>
<td>Bread, Whole Wheat (675 g)</td>
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<td>1.68</td>
<td>3.51</td>
<td>2.97</td>
<td>3.19</td>
<td>3.94</td>
<td>6.73</td>
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<tr>
<td>Bread, Whole (675 g)</td>
<td>1.76</td>
<td>1.68</td>
<td>3.51</td>
<td>2.7</td>
<td>3.19</td>
<td>3.94</td>
<td>7.42</td>
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<tr>
<td>Rolls x8, Hamburger (350 g)</td>
<td>2.17</td>
<td>1.75</td>
<td>2.14</td>
<td>1.65</td>
<td>2.74</td>
<td>2</td>
<td>4.19</td>
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<tr>
<td>Frozen Fish Fillets (400g) (kg)</td>
<td>2</td>
<td>4.9</td>
<td>4.9</td>
<td>4.4</td>
<td>6</td>
<td>4.67</td>
<td>6</td>
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<tr>
<td>Frozen Green Beans</td>
<td>2.7</td>
<td>4.5</td>
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<td>3.7</td>
<td>5.21</td>
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<td>Frozen Mixed Vegetables</td>
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<td>4.5</td>
<td>4</td>
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<td>3.2</td>
<td>3.2</td>
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<tr>
<td>Frozen Peas</td>
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<td>3</td>
<td>3.5</td>
<td>2.2</td>
<td>4.53</td>
<td>14.68</td>
<td>5.7</td>
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<tr>
<td>Frozen Orange Juice (355 g)</td>
<td>2.09</td>
<td>1.76</td>
<td>1.24</td>
<td>1.67</td>
<td>1.69</td>
<td>2.39</td>
<td>1.69</td>
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<tr>
<td>Item</td>
<td>Angelino's Price</td>
<td>Market Fresh Price</td>
<td>Goodness Me Price</td>
<td>NFB Score</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>-----------</td>
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<td></td>
</tr>
<tr>
<td>Frozen Strawberries (600 g)</td>
<td>4.02</td>
<td>4.98</td>
<td>5.94</td>
<td>3.97</td>
<td>4.98</td>
<td><strong>4.5</strong></td>
<td>3.6</td>
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<tr>
<td>Baked Beans (398 mL) (kg)</td>
<td>1</td>
<td>0.95</td>
<td>1</td>
<td>0.96</td>
<td>1.27</td>
<td>1.63</td>
<td><strong>1.29</strong></td>
<td>2.19</td>
<td><strong>1.29</strong></td>
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<tr>
<td>Tuna (170 g)</td>
<td>0.99</td>
<td>0.97</td>
<td>1.7</td>
<td>1.7</td>
<td>1.5</td>
<td>0.88</td>
<td>2.57</td>
<td>2.99</td>
<td>5.38</td>
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<tr>
<td>Salmon (213 g)</td>
<td>2.17</td>
<td>2.26</td>
<td>1.87</td>
<td>2.83</td>
<td>1.87</td>
<td>2.3</td>
<td><strong>2.44</strong></td>
<td>3.79</td>
<td>7.09</td>
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<tr>
<td>Peaches (398 mL)</td>
<td>1.43</td>
<td>1.23</td>
<td>1.23</td>
<td>1.44</td>
<td>1.63</td>
<td>1.63</td>
<td><strong>1.43</strong></td>
<td><strong>1.43</strong></td>
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<tr>
<td>Corn, Whole Kernal (341 g)</td>
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<td>0.89</td>
<td>0.99</td>
<td>1.09</td>
<td>1.33</td>
<td>0.95</td>
<td>1.99</td>
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<tr>
<td>Tomatoes, Whole (796 mL)</td>
<td>0.96</td>
<td>1</td>
<td>1</td>
<td>1.03</td>
<td>1.43</td>
<td>1.27</td>
<td>2.99</td>
<td>2.47</td>
<td>3.99</td>
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<tr>
<td>Apple Juice (1.36 L)</td>
<td>1.36</td>
<td>1.32</td>
<td>1.77</td>
<td>1.36</td>
<td>2.04</td>
<td>1.36</td>
<td>6.47</td>
<td>2.58</td>
<td>4.08</td>
</tr>
<tr>
<td>Tomato Juice (1.89 L)</td>
<td>3.02</td>
<td>2.46</td>
<td>2.46</td>
<td>2.97</td>
<td>3.02</td>
<td>3.21</td>
<td>4.16</td>
<td>5.29</td>
<td>8.32</td>
</tr>
<tr>
<td>Bran Flakes with Raisins (775 g)</td>
<td>5.12</td>
<td>3.33</td>
<td>3.72</td>
<td>2.74</td>
<td>4.03</td>
<td>4.96</td>
<td>6.35</td>
<td>9.01</td>
<td><strong>4.7</strong></td>
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<tr>
<td>Toasted Oat O's (525 g)</td>
<td>3.78</td>
<td>2.05</td>
<td>3.94</td>
<td>2.05</td>
<td>3.05</td>
<td>3.99</td>
<td>7.23</td>
<td>6.99</td>
<td>9.68</td>
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<tr>
<td>Oatmeal (not Instant) (1 kg)</td>
<td>2.8</td>
<td>2.1</td>
<td>3</td>
<td>3.3</td>
<td>3.5</td>
<td>7.1</td>
<td>3.49</td>
<td>3.99</td>
<td>4.38</td>
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<tr>
<td>Whole Wheat Flour (2.5 kg)</td>
<td>4</td>
<td>4.98</td>
<td>3.5</td>
<td>4.48</td>
<td>4</td>
<td>5</td>
<td>9.98</td>
<td>10</td>
<td>7.1</td>
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<tr>
<td>Enriched Wheat Flour (2.5 kg)</td>
<td>4</td>
<td>4.98</td>
<td>3.5</td>
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<td>5</td>
<td>9.98</td>
<td>10</td>
<td>8.2</td>
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<tr>
<td>Raisins (750 g)</td>
<td>5.25</td>
<td>5.33</td>
<td>5.48</td>
<td>7.14</td>
<td>6.68</td>
<td>5.93</td>
<td>13.37</td>
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<tr>
<td>Lentils, Dry (454 g)</td>
<td>0.86</td>
<td>0.91</td>
<td>1.27</td>
<td>1.09</td>
<td>1.27</td>
<td>1.27</td>
<td>3.99</td>
<td>5.36</td>
<td>6.14</td>
</tr>
<tr>
<td>Cracker (450 g)</td>
<td>1.94</td>
<td>1.94</td>
<td>1.98</td>
<td>2</td>
<td>2.79</td>
<td>2.48</td>
<td>8.98</td>
<td>4.05</td>
<td>15.86</td>
</tr>
<tr>
<td>Peanut Butter (500 g)</td>
<td>2</td>
<td>1.5</td>
<td>1.95</td>
<td>1.95</td>
<td>2.75</td>
<td>1.25</td>
<td>3.99</td>
<td>6</td>
<td>7.99</td>
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<tr>
<td>Vegetable Oil (1.89 L)</td>
<td>2.84</td>
<td>2.87</td>
<td>3.46</td>
<td>2.84</td>
<td>4.35</td>
<td>3.4</td>
<td><strong>3.71</strong></td>
<td>6.24</td>
<td><strong>3.71</strong></td>
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<tr>
<td>Salad Dressing (475 mL)</td>
<td>1.57</td>
<td>1.57</td>
<td>1.85</td>
<td>1.58</td>
<td>2.47</td>
<td>1.81</td>
<td>5.06</td>
<td>6.6</td>
<td>5.94</td>
</tr>
<tr>
<td>Pasta (900 g)</td>
<td>0.99</td>
<td>1.26</td>
<td>1.71</td>
<td>0.99</td>
<td>1.98</td>
<td>1.53</td>
<td>5.38</td>
<td>5.4</td>
<td>5.38</td>
</tr>
<tr>
<td>Rice (900 g)</td>
<td>1.53</td>
<td>1.35</td>
<td>1.44</td>
<td>1.71</td>
<td>1.8</td>
<td>3.6</td>
<td>4.19</td>
<td>4.95</td>
<td>6.52</td>
</tr>
<tr>
<td>Peanuts (700 g)</td>
<td>2.87</td>
<td>3.92</td>
<td>6.02</td>
<td>6</td>
<td>6.44</td>
<td>4.62</td>
<td>9.31</td>
<td>6.23</td>
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**GRAND TOTAL**

<table>
<thead>
<tr>
<th>Angelino's Price</th>
<th>Market Fresh Price</th>
<th>Goodness Me Price</th>
<th>NFB Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>207.03</td>
<td>222.13</td>
<td>223.72</td>
<td>228.88</td>
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**Missing NFB Items**

<table>
<thead>
<tr>
<th>Food Affordability Index Score</th>
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</thead>
<tbody>
<tr>
<td>1</td>
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</tbody>
</table>

**Note:** All emboldened numbers for Angelino's, Market Fresh, and Goodness Me are imputed values based on the average of that particular food item across the other stores.
10.2. The Survey

Questionnaire: Food Mirages in Guelph, Ontario: A Closer Look at Food Affordability and Accessibility.

Note: Please excuse the formatting for the appendix. The .doc file for the survey had incredibly finicky formatting. You will find the survey questions just below.

1. What is your age?

2. What is your gender?

3. What is your marital status?

4. What is your ethnicity?

5. Are you currently employed full-time?

6. Are you currently employed part-time?

7. How many people live in your household? (Only including one’s children and spouse/common-law partner)

8. What is the highest level of education that you have completed?
   a. None
   b. Junior High School
   c. High School
   d. College
   e. University – Undergraduate
   f. University – Graduate

9. What is your personal after-tax yearly income?

10. What is your combined household after-tax yearly income?

11. How frequently do you buy groceries from a grocery store or grocery market?
   a. Once per 30 days
   b. Once per 21 days
   c. Once per 14 days
12. Approximately, how much money do you spend per food shopping trip?

13. Approximately, how much total money do you spend per month on food?

14. Do you consider the downtown Guelph grocery stores to be ____ expensive than other grocery stores outside of downtown?
   a. Much more
   b. More
   c. Equal
   d. Less
   e. Much Less

15. Have you received food from a food bank, food voucher program or soup kitchen within the past ____ ?
   a. 1 week
   b. 1 month
   c. 3 months
   d. 6-12 months
   e. None of the above

16. How many times per day do you eat or drink canned, frozen, preserved or juiced fruits and vegetables?
   a. Less than once per day
   b. One
   c. Two
   d. Three
   e. Four
   f. Five or more

17. How many times per day do you eat fresh fruits and vegetables?
   a. Less than once per day
   b. One
   c. Two
   d. Three
   e. Four
   f. Five or more
18. How many times do you eat at restaurants (or take out) per month?
   a. Zero
   b. Once
   c. Twice
   d. Once per week
   e. Multiple times per week
   f. Almost everyday

19. How many times do you eat fast food per month?
   a. Zero
   b. Once
   c. Twice
   d. Once per week
   e. Multiple times per week
   f. Almost everyday

10.3. Interview Questions

Thesis Interview Questions.

1) Do you currently live in downtown Guelph? What is the nearest intersection to your home?

2) Which grocery store(s) do you typically buy groceries from?

3) How frequently do you buy groceries?

4) Do you own a car?

5) What form of transportation do you use for these shopping trips? Is this form of transportation convenient? How far do you travel? How much time does it take?

6) Generally, do you have enough free time to grocery shop as often as you would like to? Is free time a problem when it comes to food shopping?

7) What do you think about the price of groceries available in downtown Guelph? Outside of downtown? Do you notice a difference in the price of foods at various grocery stores (for example, Food Basics vs. Zehrs)?

8) Do you notice a difference in the quality of the foods (for example, the freshness of the produce and meats) at different grocery stores?

9) Do you buy more, less, or an equal amount of food when you shop at a lower cost grocery store (for example Food Basics or No Frills) than when you shop at a more expensive grocery store (for example Zehrs, Metro or Market Fresh)?

10) Other than grocery stores, how do you find affordable food? For example, do you participate in the Fresh Food Box program at the Community Health Centre, order food from a meal delivery service, buy directly from a farm or any other alternative?

11) Do you grow food in a personal garden, community garden, or volunteer on a farm?
12) What do you think are the characteristics of a healthy diet? Is eating a healthy diet important to you? Why or why not?

13) Do you feel that there is any particular food group, food type, or specific food that is currently lacking in your diet that you feel would improve your dietary health? Is there anything lacking in your diet that you feel like you need but do not have?

14) Do you perceive any barriers, such as high cost, lack of information on nutrition/food, problems with public transportation, or availability (e.g. long distance from an affordable grocery store), to obtaining more healthy foods? Are language barriers, cultural discomfort, or discrimination something you have experienced?

15) In your household, do you share food shopping responsibilities with anyone else? Does one person typically do more of the food grocery shopping than another household member?

16) Have you ever had to skip meals due to lack of food? Or skip meals in order to feed your children? Is this a regular occurrence?

17) Do you make a conscious effort to make healthy food choices? If so, where have you learned about healthy food choices?

18) What strategies do you use to make sure that you and your family get healthy food? Enough to eat?

19) When you buy groceries at more expensive grocery stores, do you buy the same amount or less of fresh fruits, vegetables, whole grains, and unprocessed meats than you would at a lower cost grocery store?

20) Do you believe that you would eat more fresh, unrefined, and unprocessed foods if you lived within walking distance (<1 km or <15 minute walk) to a lower cost grocery store? In this circumstance, do you feel your diet and/or health would improve?

21) Do you sometimes experience stress related to food affordability and availability? If so, please explain.

22) If money were not any concern to you, how do you think your diet would change?

23) Why do you think there is no affordable food downtown? What reasons?

24) Is there any other issue on your mind regarding food affordability and accessibility that you wish to mention here?

25) How did you hear about the study?

10.4. Map of the Food Environment in Chatham, Ontario

Map 4 displays similar data to Map 3, but for the food environment for the municipality of Chatham, Ontario, which has surprisingly similar characteristics to the Guelph map. Similar to Guelph, we see clusters of dissemination areas with a higher prevalence of <LICO residents located in food deserts and we also find an
underserved downtown area in the center of the map with a high prevalence of <LICO residents. The areas to the immediate east and west of central downtown

Map 4. The Interaction of Grocery Store Cost and LICO Prevalence by Dissemination Area in Chatham, Ontario

LICO Prevalence (%)
Quintiles
- 0 - 2.6%
- 2.7 - 5.3%
- 5.4 - 11.6%
- 11.7 - 16.5%
- 16.6 - 26.2%

Note: There are no high-cost full-service grocery stores in Chatham, Ontario.

area are also lower-income areas that are food deserts, similar to Guelph. Most of
the lower-income neighborhoods across Chatham are kilometers away from low-cost grocery stores, and thus experience similar food affordability and accessibility challenges to those faced by the <LICO residents in Guelph, thus showing that this is not an issue unique to Guelph.